



# PROCEEDINGS



**The 2<sup>nd</sup> Regional Conference on Cow Comfort & Lameness  
RCCCL**

**The 6<sup>th</sup> International Symposium of Veterinary Surgery  
ISVS**

**The 15<sup>th</sup> Iranian Symposium of Veterinary Surgery, Anesthesia  
and Diagnostic Imaging  
ISVSAD**



**Iranian Veterinary Surgery Association (IVSA)**

**Faculty of Veterinary Medicine, Tehran University**





**The 2<sup>nd</sup> Regional Conference on Cow Comfort & Lameness**  
**18-20 July 2022**  
**University of Tehran, Iran**

**President**

Ahmadreza Mohammadnia (DVM, DVSc)

**Chair of scientific committee**

Ahmadreza Mohammadnia (DVM, DVSc)

**Chair of Executive committee**

Reyhaneh Sangtarash (DVM, MSc)



**The 6<sup>th</sup> International Symposium of Veterinary Surgery**  
**The 15<sup>th</sup> Iranian Symposium of Veterinary Surgery, Anesthesia**  
**and Diagnostic Imaging**  
**16-18 July 2022**  
**University of Tehran, Iran**

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## **Dear Colleagues And Friends**

It gives us a great pleasure to welcome you all the veterinary surgeons, professors and students for the "6th international conference and 15th national symposium on veterinary surgery".

The conference will host leading speakers to present and discuss the latest knowledge and innovations in veterinary medicine, demonstrating the value of the profession for the public good in our rapidly changing world.

This congress has represented a challenge for us due to the difficulties created by the COVID19- pandemic. The drawbacks, however, have become an opportunity. We are preparing to make you feel safe, cared for and protected. We have learned ever since the start of the pandemic, to turn distance into art, applying the utmost care for details because we know that all the effort is worth it. We strongly hope and know that it will be a necessity to make use of this symposium as an occasion to further developments of veterinary science. This is a unique opportunity to expand our participants and welcome past and new attendees from all over the world.

The main aim of the conference is to enhance your knowledge. Immerse yourself in the most complete selection of veterinary symposium. No matter what your interest or area of focus, you'll discover it at our Convention. This conference will empower the application of new information to transfer the latest experiences with best scientific sessions, exhibitions, poster presentations, oral presentations, workshops, and great keynotes. Topics will include: Soft Tissue Surgery, Small Animal Orthopedics Neurosurgery, Diagnostic Imaging, Equine Orthopedics and Lameness, Anesthesia, Analgesia and Pain Management, Dentistry, Regenerative Medicine and Complementary Medicine and Rehabilitation.

Through this conference, we would like to engage with all of in an open and constructive dialogue. Please help us to make the conference successful by participating actively in all discussions. We are excited to host you for this wonderful experience and look forward to seeing you in Tehran!

**Mohamadmehti Dehghan**  
**President of the 6th ISVS and**  
**the 15th ISVSAD**



**Dear colleagues and participants in the second Regional Conference on Cow Comfort and Lameness (RCCCL)**

Sixth International symposium of Veterinary Surgery (ISVS) and the Second Regional Conference on cow comfort and Lameness (RCCCL) make an opportunity for gathering dairy industry and exchanging skills and information in this field. The Iranian Veterinary Surgery Association (IVSA) started the first RCCCL from 2016. Since 2016, with the first RCCCL and 2019 with the First National Conference on Cow Comfort and Lameness (NCCCL) this part of surgical sciences in dairy cows has also been considered by the IVSA.

The Covid19- pandemic and its related problems resulted in missing face-to-face opportunity for exchanging sciences and skills. By approaching to more stable condition regarding Covid19-, IVSA in collaboration with Tehran University is going to uphold the second RCCCL to welcome delegates from dairy industries of Iran and overseas countries.

Kind support of the surgeons, veterinarians, executive teams, and students who have helped us by scientific and executive activities and all those involved in veterinary sciences and animal husbandry is greatly appreciated.

I kindly appreciate our kind sponsors, I am sure by mutual collaborations between participants and sponsors, very good fruits will be provided for all effector parts.

I thank all of you who participate in this event and hope that enjoy this excellent scientific event and also enjoy very nice natural and historical beauties of our country during your stay in Iran.

**Ahmadreza Mohamadnia  
President of the second RCCCL and  
President of IVSA**

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# **Keynote Lectures**

## **Abstracts of RCCCL**







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## Economic Losses Associated with Lameness in Dairy Herds

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Lameness is a major issue in dairy farming. Estimates on lameness prevalence have ranged from 10% to as high as 55% in US and North America and is ranked as the top 4 reasons of early culling in Canadian herds by 6.4% (Alvergnas et al., 2019; Dolecheck and Bewley, 2018; Puetro et al., 2021), is the second costly disease in the UK cattle livestock sector after mastitis (53.5 million pounds), which imposes 0.97 cent/liter milk production in a typical 100-cow British dairy facility (Alfonso et al., 2020). Lameness has immediate and long-term consequences on health and productivity, which results in early culling of cows from the herd. Immediate costs of a case of lameness include treatment, medical interventions, hoof trimming and labor. However, a remarkable and relatively long lasting reductions in milk production that may begin even several weeks before the lameness is detected until a few weeks after it is treated (Reader et al., 2011), plus significant reductions in reproductive performance (as demonstrated by longer calving intervals) can be viewed as long-term effects of lameness tremendously increasing lameness costs.

Several studies attempted to estimate the economic losses associated with lameness (as reviewed by Dolecheck and Bewley, 2018; Alvergnas et al., 2019). The accuracy and validity of these estimates are widely dependent on specific purpose of the researcher, the method used for cost estimation and number of factors taken into consideration. In a model for estimation of the immediate lameness cost, the veterinary intervention, therapeutics, extra trimming, and labor were estimated to cost US \$78/cow per year. However, when additional factors such as decreased milk and milk components yield, non-salable milk, reproductive failure, and risk of death were additionally included, total costs exceeded 1070 \$/cow (Dolecheck and Bewley, 2018).



Recently, a detailed discussion on estimates of lameness losses have divided total losses into costs and expenses. In this categorization, labor expense share accounted for 2 to 16% of losses where the labor was producer and for 1 to 43% where a veterinarian or a hoof trimmer was called (ranked 7<sup>th</sup> and 5<sup>th</sup> cost-burden factor, respectively) (Dolecheck and Bewley, 2018). Contradictorily, in a survey comparing seven major production-related diseases of dairy cows, veterinarians and industry practitioners identified lameness as the 2<sup>nd</sup> labor-costly disease behind displaced abomasum. The exact contribution of labor in total lameness costs depends on whether inside or outside labor is hired, number of factors involved in the cost estimation model and whether different types of lameness were given an equal or unequal cost.

An important factor in estimating the cost associated with lameness is therapeutics such that it sometimes has surpassed labor cost (Liang et al., 2017). Therapeutic expenses vary with type and severity of lameness, parity (lesser for primiparous cows) and labor fee for implementing the treatment (i.e. inside or outside labor resources). Indirect economic losses arising from lameness treatment are non-salable milk and decreased milk yield, the cost share of each is related to the type and severity of lameness.

Yet labor, treatment, and preventive management are costly, the largest cost associated with lameness is related to reduced milk production and non-salable milk. Recent estimates have indicated that the price value of decreased milk production varies greatly by the stage of lactation and the production history of cows. Lameness is a disease of high producing cows imposing greater drop in milk in high yielding cows during the first 100 DIM, thereby decreasing the risk of cow attaining the entire lactation. Cows calving with lameness were estimated to loss 1289 kg milk through entire lactation followed by mid-, late- and early-lactation lame cows by -1141, -1047 and -811 kg, respectively (Pietro et al., 2021). Impact of lameness on the price of lost milk depends to the intensity of milk reduction, the price of milk, cow welfare considerations by consumers and whether non-salable milk is used for calves (Dolecheck and Bewley, 2018; Alvergnas et al., 2019). Lame cows completed their lactation had between \$449



and \$853 less gross profit (income over feed cost – treatment cost of lameness) compared with healthy counterparts.

Very few studies have accounted for the cost of early lameness detection (ordered gait scoring, hoof trimming, observation, artificial intelligence) and preventive management tools (foot bath, bedding, walking surfaces, floor matting, nutrition) in total lameness cost estimations, which pinpoints the need for further research in this area. However, it is obvious that these tools are low-cost and serve to assist in early detection of lameness and to provide cows with a desired welfare, thereby decreasing tremendous losses associated with subsequent clinical lameness. Recently, precision technologies using video learning and artificial intelligence have shown promising accuracies for early detection lameness (Silva et al., 2021). As for any novel technology, the benefit: cost of applying such technologies needs to be identified. Additionally, these technologies need to be pro-active, i.e. alert the producer very earlier than lameness has been visible, and be reasonably accurate to generate minimum false-positive data. As these technologies are being exploited also for other health-related diseases, an integrated system using combined automation-based approaches likely increase the robustness of the system in monitoring cow health and behavior while decreasing the investment cost.

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## Lying Times and What Governs Lying Times

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How a cow spends her day governs to a large extent her health, welfare and production. Conversely, there are many factors regarding a cow's health, welfare and production which in turn govern how she spends her day. Therefore, the relationships between a cow's time budget and her welfare are complex.

Housed cows behave differently to grazing cows, and this is largely due to the differences in feeding patterns, and the total amount of time spent eating. Apart from eating and milking, the other significant activity in a cow's day is lying down. In the main, she will be ruminating whilst lying. There is evidence that standing rather than lying whilst ruminating has a detrimental impact on foot health, due to greater overall standing time. It is possible that there is lost production efficiency too when a cow has long standing times.

Lying times are best understood in three aspects:

The overall lying time in a 24 hour period

The number of lying bouts in a 24 hour period

The duration of individual lying bouts: mean and range

Factors affecting a cow's lying behaviour can be divided between herd factors, and factors pertinent to the individual cow (Tucker et al, 2021).

Individual cow factors include:

Lameness - generally longer lying times, and fewer bouts

Mastitis - generally shorter lying times

Other pain/ sore/ lesions (e.g. hock sores) - can be shorter or longer

Illness - shorter or longer

Calving - shorter around calving, and with increased number of bouts



Age/ parity; possibly older cows lie for longer

Stage of lactation; tends to be a nadir (lowest point) at around 30-60 days in milk. Possibly related to feeding/eating time. Possibly due to udder discomfort.

Yield - a complicated relationship

Acclimatisation/ bullying, especially fresh calved heifers

Oestrus - lying times typically halve when in heat

Herd factors include:

Lying surface type/ comfort

Bedding depth; bedding surface, whether wet or dry

Cubicle (freestall) design/ size

Acclimatisation to cubicles

Stocking density/ availability of free stalls

Pasture vs housed

Floor (standing) surface

Feeding times (time spent eating)

Milking times (time away from beds); lock-up times (time away from beds)

Re-bound effect: lying deprivation (if > 3 hours) = longer compensatory lying

Temperature (THI)

If outside, the weather, especially rain

Stimulation: low stimuli/ boredom/ depression/ darkness? = longer lying

Lameness (at a herd level)



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Target lying times and bout frequency will be described for different scenarios. Different ways to estimate lying times will be discussed, enabling farmers and their advisers to see how a herd might compare with the optimum.

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## Engaging with Lameness Using The Healthy Feet Programme

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Lameness prevalence is often under-estimated on UK dairy farms. Foot health is complex and multi-factorial. Discussion with farmers about the subject can evoke feelings of defensiveness, and sometimes, a sense of being overwhelmed by not knowing clearly what to do.

Lameness can't be solved by selling a vaccine, or a footbath product, or a novel medicine, or a feed additive. In other words, there are no silver bullets for foot health. However, this is not to say that foot health can't be improved. Having a logical approach and confidence in a robust management plan, coupled with coaching and some training, has been shown to be effective to reduce lameness (Atkinson and Fisher, 2013). The framework described here is the Healthy Feet Programme (HFP), which was developed in the UK in 2010.

Delivery of the HFP is by trained Mobility Mentors who are mainly vets, and also some suitably qualified professional foot trimmers. The training to become a Mobility Mentor covers coaching and mentoring skills as well as the technical aspects of lameness management, and is delivered over four modules, each one day.

The HFP is underpinned by regular mobility scoring by a trained, independent and accredited scorer. An analogy is that mobility scoring is to lameness management what individual cell counts are to udder health management. The value is in collecting prevalence data, plus being able to identify cows for early treatment.

Next, the **Four Success Factors** for foot health are central to the programme. These are:

Low Infection Pressure

A Robust Foot

Low Forces



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EDPET: Early Detection, Prompt Effective Treatment.

Individual lameness reduction interventions will come under each of these four categories. As examples, foot bathing is part of Low Infection Pressure; body condition management is part of A Robust Foot, and bedding comfort/lying times are aspects of Low Forces.

A **Lameness Map**, using lesion prevalence data, assists in targeting the actions which will be most beneficial for the particular farm. This happens after an appraisal of whatever records there. If there are none, or they are unreliable, a participatory epidemiology approach is used, whereby, using lesion pictures, the farmer describes what they most commonly encounter.

The Lameness Map takes a balanced scorecard approach, to prioritise the interventions and changes which will yield the most beneficial outcomes, and match this with findings from a thorough farm appraisal. For example, a farm which sees a lot of white line lesions will need to focus on horn quality, sole thickness and reducing shearing forces. Probably, a major point of attention will also need to be on stockpersonship skills, and achieving better cow flow. The Mobility Mentor may need to offer additional training in this area, and there are resources available for them to be able to do so in an online “Mobility Mentor resource centre”.

Regular whole herd mobility scores enable progress to be tracked. The **HFP Cost Calculator** enables the economic impact to be discussed.

The programme is designed to be initially delivered in three distinct on-farm sessions: a visit for a farm investigation, a visit to check some feet and review how lesions are being treated, and a visit to facilitate the farm team to develop their action plan.

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**Website**

AHDB Healthy Feet Programme: <https://ahdb.org.uk/knowledge-library/introduction-to-the-healthy-feet-programme>



## Understanding The Dual Roles of Cow Comfort In Herd Lameness Prevention

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Globally we still find on average ~ 23% of dairy cows lame in herds with a variety of management systems, while the target remains to have less than 10% lame at any one time. While there is a strong body of literature identifying risk factors for lameness, the dairy industry has failed to effectively and broadly implement the necessary changes needed to prevent lameness. Regionally however, there are some encouraging signs of progress, and these improvements appear to begin with enhancements to cow comfort.

Central to maximizing cow comfort is to ensure optimized resting behavior – which in essence means that we need to provide a place for cows to rest when they want to, for as long as they need to. Note that longer and longer lying times are not necessarily desirable, as sick cows (including lame cows under certain circumstances) tend to have longer lying bouts and longer lying times compared to healthier, higher producing dairy cows.

Optimal resting behavior can be obtained in freestall housed dairy facilities through stall design and bedding management, by taking measures to cool the cow during periods of heat stress and by allowing sufficient time and access for rest. Under these circumstances mean lying times are typically in the range 11.5-12.5 h/d.

Recommendations exist to size the stall relative to the size of the cows using them, avoid obstructions to normal rising and lying movements, and to utilize deep loose bedding – particularly sand. Loose bedded packs provide an alternative housing option. The management of heat stress involves implementing a program which provides fast moving air in the resting area (target 1-2 m/s measured at 0.5 m above the resting surface) and sufficient exhaust capacity to force heat, moisture and noxious gases from the barn (target 40-60 air changes per hour and at least 2,550 m<sup>3</sup>/h per cow), and the strategic use of water to mist the air





or soak the cow at the appropriate times to assist with cooling in the warmest climates. The time available for lying is influenced by pen sizes relative to parlor throughput or robot milker availability, and by management interactions such as health screening cows in headlocks at the feed bunk. Access to a stall is compromised in facilities that are overstocked.

Cows that fail to rest adequately in early lactation are at greater risk for lameness later, and resting behavior is also significantly impacted by lameness once it occurs – hence the dual roles of cow comfort. Increased standing activity, especially on hard concrete surfaces is a significant risk factor for lameness. This overloading of the claws, coupled with poor hoof care and poor hoof balance creates inflammation of the corium below the third phalanx leading to poor quality horn formation, sole hemorrhage, and in the most severe cases sole ulcer formation – cows ‘get lame’. Once the cow is lame, if she is not treated promptly, she will struggle to transition from standing to lying and lying to standing, especially on firm unyielding surfaces. This leads to very prolonged or very shortened lying times, and a tendency to stand for long periods in the stall and elsewhere. Comfortable resting areas not only reduce the risk for becoming lame, but also promote recovery from lameness.

Enormous strides have been taken to improve cow comfort over the last decade by developing facility design recommendations which merge structural requirements with the needs of the cow. When implemented we see reductions in hoof lesion formation and lameness and higher productivity, creating a ‘win, win’ for the cow and the dairy producer.



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## Optimizing Time Budgets to Maximize Comfort in Transition Dairy Cows

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Promoting feed intake by lactating dairy cows, particularly those in early lactation, is critical for the improvement and maintenance of milk production and health. Many dairy cows are capable of producing quantities of milk in much greater amounts than which can be maintained by nutrient intake in early lactation. Research in dairy cattle nutritional management has resulted in many discoveries and improvements in dairy cow health and production. Despite many advances this field we are still faced with the challenge of ensuring adequate dry matter intake (DMI) to maximize production and prevent disease, particularly in dairy cows during the transition period.

There is substantial evidence that the DMI, and subsequent health and production, of transition cows is associated with fat mobilization, inflammation, and stress. Specifically, both inflammatory conditions and excessive mobilisation of body reserves have been shown to reduce feed intake in early lactation. Furthermore, in the weeks leading up to calving and those thereafter, DMI in cows may be reduced due to various stressors. In addition, stress hormones, such as cortisol, may have direct, negative impacts on immune and reproductive function. Further, chronic stress in dairy cows has been associated with increased risk of chronic, systemic inflammation, which in turn increases risk of infectious and metabolic diseases, impaired reproduction, and lower milk production.

It should not surprise us that we see connections between these factors, particularly in the weeks leading up to calving. Researchers have demonstrated that disease incidence and/or risk of death in early lactation dairy cows are all associated with markers of fat mobilization, inflammation, and stress in pre-partum period. Furthermore, physiological markers of stress and inflammation pre-partum have been associated with reduced milk production in early lactation.

While research is still on-going to understand where many of these ef-



fects originate, and what drives what, it is clear that maintaining high, consistent DMI through transition is important for minimizing risk of problems. Furthermore, behavioural and physiological stressors are known to have negative impacts on that DMI. Those stressors often have negative effects on the time budgets of dairy cows, as does the overall comfort of the dairy cow. A dairy cow has a number of things that she needs to accomplish every day. Dairy cows will spend 3-5 h/d at the feed bunk, 0.5 h/d drinking, 10-13 h/d lying down, 2.5-3.5 h/d outside the pen (milking), and 7-9 h/d ruminating. While every 24-h day should be enough time to allow cows to do these things, we know that any factor which may impinge of the cow's ability to devote her time to those activities may have negative consequences. This is particularly problematic in early lactation, as at calving, feeding, resting, and ruminating activity all decrease, while standing time increases.

Housing and management, thus, must be focused on minimizing stress and allowing cows the time to perform behaviours they require. Dairy cows need the time and availability of resources to perform those behaviors which are not only important for them, but also for maintaining good production and health. Management of feed should be focused on maximizing opportunities for cows to go the bunk across the day, either by increasing the frequency of feed delivery or by altering the timing of feed delivery, while pushing up feed continually between feedings to ensure constant access. Overcrowding needs to be avoided for transition cow pens, so that cows can maximize their eating, ruminating, and lying opportunities. Further, keeping first-lactation heifers in separate groups, as well as minimizing group changes, helps decrease social stress. Finally, behavioral monitoring during the transition period may also be important for identification of health issues in early lactation, and also for the evaluation of herd-level management strategies and events.



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## An Overview of Digital Dermatitis in Iran

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Bovine digital dermatitis (BDD) was first reported in Iran in 1979. The highly contagious characteristics of these lesion resulted in about 50% within herd prevalence in some part of the world. This painful lesion makes the cow uncomfortable and it is a welfare issue due to lameness. BDD is a complex polymicrobial disease that multiple species of *Treponema* are critical in development of lesions. The detection of *Treponema* species in non-healing claw horn lesions arose attention to control the disease in herd in herds affected by this type of claw horn lesions. Although there are controversial reports about the significant economic losses of BDD, the economic impact of this lesion on heifers including reduced milk production and reproductive performance effects is notable due to the age specific prevalence of BDD in younger cows.

A comprehensive literature review about BDD in Iran resulted 27 papers met the inclusion criteria. The research was conducted in Farsi (Magiran, SID, CIVILIKA) and English (Pub Med, CABI) databases and google scholar including “Digital Dermatitis” AND “Iran”. This search resulted in four conference abstracts, 1 review article and 23 original articles and thesis. These papers were about Etiology (2), Histopathology (4), treatment and monitoring strategy (5), The association between BDD and management indices (5) and reporting prevalence (7). The first step of evaluating the economic losses or the burden of the disease on dairy industry is to understand the prevalence and annual incidence. The search results showed that the prevalence, which is studied in central parts of Iran, is reported up to 13.45% (cow level



prevalence). However, there is not any comprehensive study about the herd level prevalence nor cow level prevalence in different parts of Iran.

The unpublished data about the annual incidence due to passive recording systems in three commercial farms (between 1000 to 3500 dairy farms) showed a rate between 1.8% - 15.63%. In most circumstances BDD is the commonest infectious lesion in these dairy herds and it is in the second after sole ulcer.

The lack of published data and a monitoring and survey system for recording the incidence of claw horn lesion specially BDD caused a blur interpretation of BDD situation in Iran. The importance of recording and analyzing lameness data accurately, is neglected and the need for updating data recording and analyzing procedures in dairy farms and conducting comprehensive and targeted researches to evaluate lameness situation in the herds is required.

**Keywords:** Bovine Digital Dermatitis, dairy farm, claw lesions, Iran.



## Improve Reproductive Efficiency and Profitability in Dairy Herds with an Emphasis on Cattle Comfort

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The primary purpose of this review is to summarize what is known about the impact of improved cow comfort on economically important responses in dairy cattle such as feed intake, milk production, reproduction and health. Knowing the economic consequences of good or poor cow comfort should generate motivation for farmers and industry professionals to improve it. The interactions among feeding, resting and rumination are critical to cow comfort.

**Table 1:**

Observed changes in cow behavior and the economic losses that may result due to overstocking.

Changes in these behaviors:	May result in these economic losses:
<ul style="list-style-type: none"> <li>• Greater aggression &amp; displacements at feed bunk</li> <li>• Greater feeding rate</li> <li>• Reduced resting time</li> <li>• Increased idle standing in alleys</li> <li>• Decreased rumination</li> <li>• Subordinate (i.e. primiparous and lame cows) most affected</li> </ul>	<ul style="list-style-type: none"> <li>• Less milk yield</li> <li>• Lower milk fat</li> <li>• Greater SCC</li> <li>• More health disorders</li> <li>• Increased lameness</li> <li>• Fewer cows pregnant</li> </ul>

Figure 1. 24-hour time budget of a dairy cow.

- 5.0 h/d eating
- 12-14 h/d lying (resting)
- 2.0-3.0 h/d standing, walking, grooming, agonistic, idling
- 0.5 h/d drinking
- 20.5-21.5 h/d total needed
- 2.5-3.5 h "milking" = **24 h/d**



The 24-h time budget (Figure 1) represents the net behavioral response of a cow to her social and physical environment (Grant, 2004). Deviations from benchmarked behavioral routines reflect departures from natural behavior and may serve as a basis for estimating DMI, performance, health and economic losses due to inadequate management strategies. Table 1 summarizes the observed changes in cow behavior and the economic losses that may result due to overstocking.

Zoetis and Compeer Financial's analysis of 11 years of herd data from 489 year-end financial and production record summaries identified six key drivers of profitability on dairies based on net farm income. Herds that perform well in these areas achieve healthier cows, higher profits and greater staying power, lactation after lactation.

- Pregnancy Rates
- Somatic Cell Counts
- Energy-corrected Milk per Cow
- Death Losses
- Net Herd Replacement Costs
- Heifer Survival

### **Cow Comfort Economics**

Cow is comfort compromised by stocking density, lying place comfort, space and design and heat stress that all can induce: increase lameness and locomotion problem, disturb estrous behavior, increased days open, decreased conception rate, embryonic death, anestrous, more culling, mastitis

### **Overcrowding**

The greatest economic consequence of overcrowding may be the long-term health (lameness, mastitis, etc) and reproduction consequences, although under some conditions changes in milk yield, milk quality and milk composition may occur.

Schefters et al. (2010) reported that, based on observations in large



commercial dairy farms in the Midwest, conception rate decreased by 0.1 percentage point per 0.01 greater cows/stall. In other words, in a herd with a 120% stocking density, conception rates were on average 2 percentage points lower (e.g., from 40% to 38%) than in herds that were not overstocked. Caraviello et al. (2006) evaluated data from 153 farms in an effort to identify factors of greatest significance in influencing reproductive performance. These researchers found that as bunk space decreased from 24 to 12 inches per cow, percent of cows pregnant by 150 days in milk decreased from 70 to 35 percent.

Reproductive efficiency is closely tied to the profitability of dairy herds, and therefore successful dairy operations seek to achieve high 21-day pregnancy rates in order to reduce the calving interval and days in milk of the herd. There are various factors that impact reproductive performance, including the specific reproductive management program, body condition score loss and nutritional management, genetics of the cows, and the cow comfort provided by the facilities and management programs.

Studies directly connecting cattle behavior and reproductive performance are limited, but lameness negatively impacts reproductive performance. Lameness shows less estrous behavior than healthy cows (Walker et al., 2008). Compared with healthy cows, lame cows have delayed resumption of ovarian cyclicity (Garbarino, Hernandez, Shearer, Risco, & Thatcher, 2004), longer days open, and an increased number of breedings per conception (Hernandez, Shearer, Risco, & Webb, 2001). An economic analysis estimated that each clinically lame cow costs the dairy producer approximately \$300 (Guard, 2002). Costs associated with lameness include:

- Decreased milk production (Warnick et al., 2001; Hernandez et al., 2002; Juarez et al., 2003)
- Reduced fertility (Spreicher et al., 1997)
- Increased culling risk (Booth et al., 2004)
- Treatment costs and increased labor requirements

Lameness results in a loss of at least 5 percent and as much as 36 per-





cent milk annually, greater culling rate and reduced fertility.

### **Optimizing Cow Comfort and Reducing Heat Stress**

Many physiological, production and reproduction responses can be influenced by management and facilities, and in this section, we focus on heat stress, which has a tremendous negative impact on dairy operations, especially in tropical and subtropical regions. The negative impact of heat stress on reproduction is extensively reported in the literature, with the P/AI of hot seasons being 20 to 50% lower than cooler months of the year [Schüller, 2016]. Heat stress of dairy cows can influence dry matter intake, animal welfare [Polsky, 2017], immune system and health [Vitali, 2020], and have carryover effects into the next generation [LaPorta, 2020]. Effects of heat stress on reproduction can impact reproduction in the short term but also may have effects on oocyte quality for 40 to >100 days after the end of heat stress [Torres, 2008]. Lactating dairy cows under heat stress had reduced oocyte competence and quality, reduced fertilization rates, and poorer embryo quality [Sartori, 2002, Ferreira, 2011].

The threshold of HS experience among modern dairy cow has lowered, leading to decreased thermal comfort zone. Studies show that this threshold is lower for fertility than for lactation. HS abatement and robustness response to lactation yield lead to negative energy balance, and cow's reproductive requirements remain unfulfilled. The adverse effects of HS commence from developing oocyte throughout later stages and its fertilization competence; the oestrus cycle and oestrus behavior; the embryo development and implantation; on uterine environment; and even extend towards foetal calf. Even cows can become acyclic under the influence of HS. These harmful effects of HS arise due to hyperthermia, oxidative stress and physiological modifications in the body of dairy cows. (Abdul Sammad, 2019).

Cow comfort is an important consideration for a farm operation's reproductive program, and is listed as one of the top 10 concerns for successful reproductive management by the Dairy Cattle Reproduction Council. Greater days from calving to conception (days open) is typically associated with reduced profitability in dairy cows. This reduction is partly caused by determinants such as increased risk of culling,



and reduced milk production.

The other most important factor in cow comfort is the human-cattle interaction (Berry, 2001). Considerable research has shown productive benefits of more gentle handling and vocalizations when cows are being milked and reproduction visiting. Gentle treatment of cows, especially while in the parlor, results in 3.5 to 13 percent greater milk yield and greater empathy with cattle pain is associated with about 2000 pounds per year greater milk production. Gentle handling approaches do not cost any more than aversive handling.

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## Impact and Mitigation of Heat Stress for Mastitis Control

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According to the thermoneutral zone for lactating cows, which is between  $-15^{\circ}\text{C}$  and  $25^{\circ}\text{C}$ , mature cows are able to maintain a normal body temperature and basal metabolic rate. Dairy cow experiences heat stress and discomfort above this zone. Rectal or vaginal temperatures and respiration rate ( $> 60$  bpm) are two methods for measuring “heat,” but a combination of environmental temperature and humidity known as the temperature-humidity index (THI) measures the effect of heat stress on cows and is one of the best tools for reflecting the true impact of the environment on the cow.

The main concern is often loss of milk production, but heat stress can also cause lower milk quality, increase the incidence of mastitis and somatic cell count. Several studies have identified heat stress as a contributor to lower milk quality. In cows as other animals, Cortisol levels in the blood is an indicator of stress responses. As temperatures rise, there is an acute increase in cortisol but over time, as animals adjust to the increased heat load, cortisol levels decline. Immune function is probably impacted by this alteration in adrenal tone. The idea of a connection between endocrine and immunological function is supported by the fact that heat stress increased circulating leukocyte counts in a way comparable to direct corticotrophin injection. Prolactin is another endocrine signal of the immune system and is considered a cytokine. Prolactin is known to regulate several physiological functions via its effects on cellular processes such as proliferation, differentiation, cell survival, and immune function. The actions of prolactin are mediated through the prolactin receptor. Heat stress like other stressors will affect prolactin signaling either by synthesis, secretion of prolactin or through receptor expression. Heat stress perturbs prolactin release and affects dairy cow lactational performance and immune cell function. Collectively the effects of heat stress on cortisol and PRL are consistent with a decrease in cow immune function. Heat stress may negatively



affect the process of involution during the dry period due to endocrinological changes reduced estrogen and increased prolactin. We know that during earlier steps of involution many immune cells are active in the mammary gland to prepare mammary tissue for the next lactation. Successful immune function is very important to protect the mammary gland during lactating and non-lactating period. Some negative impacts of heat stress are, decreased milk production in subsequent lactation and Increased bulk milk SCC. Furthermore, it is important to keep bedded areas CLEAN and DRY. This will help to reduce bacteria growth and encourage cows to lay in stalls instead of the alley when trying to stay cool, but during the summer bacterial contamination of bedding material increases and increased humidity levels help provide the best environment for bacteria growth.

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## **Interpretation Of Bovine Locomotion Scoring Results, Understanding Pain In Digits And Its Outcome**

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Lameness is one of the most important causes of comfort loss in dairy herds. Pain and its associated responses to pain maybe the most important cause of lameness losses that classified as the third cause of economic losses in dairy herds. Pain is the first step of pathological events that starts in cattle feet as about 80% of lameness originates from digits especially lateral digit of the hind limbs. Pathological cascades in bovine digits following sinking of the third phalanx after coriosis are the most important cause of pain, however other inflammations of the digital skin (Interdigital space and heel area have a special concern in this inflammation) also play an important role in painful conditions of the digits. These nociceptive pain may result in gait alterations and also indirect responses like lowering social order, feed consumption, lying behavior etc. Assessment of pain may be done by hematological, behavioral and measuring its reflexes in dairy farms. Because of easier nature of behavioral assessment of pain different locomotion scoring systems were used during past years.

Some special features of cattle response to pain like lowing walking speed, alterations of gait (lowering its height, swing alterations, track up changes.....), changing in body posture, in standing and walking cows were used during past years and made different scoring systems. Five point scoring system that first used by Sprecher et al. is sidely used in Iran and other countries to assess lameness status of the herds. Some common problems following scoring were seen in different farms that can be listed as: a) High score cows necessarily do not show lesions in the hooves, b) Very large difference between and within persons were seen in cow scoring, c) Some lesions do not necessarily increase locomotion scores, D) Other pain criteria (hormonal changes, biochemical changes) do not follow scoring pattern in the herds etc. All of these findings sometime make locomotion scoring as a controversial method in dairy farm management. Locomotion scoring is done by changes in





physical finding of the gait and body posture. For example in point 3 of a 5 point locomotion scoring observer can see the shortening of the stride with more cautious gaits besides slowing walking speed. These findings are very qualitative as normal gait consist of different criteria that mostly phase of stride is the only important factor that may pay attention in walking of the animal (this is what is normally done by farmers and this is why most estimation of the farmers are much less than true incidence of the lameness in the herds) and other features of a stride like its height, landing, abduction, pattern of swinging ignores and finally the resulted in just very low agreement between different persons in cattle scoring.

Interval of scoring is another controversial issue in lameness management, the answer to the fact that scoring is not a tool for detection of lesions and is just a way for assessing pain in the walking animal maybe a clue for doing better scoring and analysis. Place of scoring, emotional and comfort status of the person, walking surfaces of the cows, time of the day and so many other factors may affect this subjective method and make its interpretation much more difficult. This is why many farmers and veterinarian move toward using more machine base systems for cattle scoring and its analysis.

This current presentation focuses on different aspects of locomotion scoring usage, interpretation of the results and descriptions about possible reasons for differences between scoring results in a dairy farm.

Keywords:Lameness, Cow, Locomotion scoring, Agreement, Hoof lesions.



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## Technology Applications In Bovine Gait Analysis: A Scoping Review

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Quantitative bovine gait analysis using technology has evolved significantly over the last two decades. However, subjective methods of gait assessment using visual locomotion scoring remain the primary on-farm and experimental approach. The objective of this review is to map research trends in quantitative bovine gait analysis and to explore the technologies that have been utilized to measure biomechanical parameters of gait. A scoping literature review was conducted according to PRISMA guidelines. A search algorithm based on PICO framework generated three components – bovine, gait, and technology – to address our objectives. Three online databases were searched for original work published from January 2000 to June 2020. A two-step screening process was then conducted, starting with the review of article titles and abstracts based on inclusion criteria. A remaining 125 articles then underwent a full-text assessment, resulting in 82 final articles. Thematic analysis of research aims resulted in four major themes among the studies: gait/claw biomechanics, lameness detection, intervention/comparison, and system development. Lameness detection (55 % of studies) was the most common reason for technology use. Studies in the field of bovine gait analysis used three main technologies: force and pressure platforms (FPP), vision-based systems (VB), and accelerometers. FPP were the first and most popular technologies to evaluate bovine gait and were used in 58.5 % of studies. They include force platforms, pressure mapping systems, and weight distribution platforms. The second most applied technology was VB (34.1 % of studies), which predominately consists of video analysis and image processing systems. Accelerometers, another technological method to measure gait characteristics, were used in 14.6 % of studies. A strong demand for automatic lameness detection influences the path of development for quantitative gait analysis technologies. Although progress has been made, more research is needed to achieve more accurate, practical, and user-friendly technologies. Keywords: Cow, Lameness Detection, Technology, Automatic



## **Evaluation of the lameness incidence between calving to first insemination on some reproductive parameters in Holstein dairy cows**

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Lameness is considered as condition of animal movement organ caused by infectious and non-infectious agents affecting the movement, standing and stepping of dairy cows. Furthermore, it is recognized as the third prominent problems causing the culling of cow from the herd after mastitis and infertility (reproduction). Based on the factor behind it and severity, the losses from lameness can be different. Lameness of dairy cows is, along with mastitis and reproduction, the third most expensive disease to treat. Economic losses in the affected herds are associated with treatment costs and the decrease in milk production. Direct costs include treatment, veterinary or trimmer visits and the time required the cost of extra time for farmers, and the cost of discarded milk. Indirect costs include, in particular, a reduction in milk production, culling, and an extension of the calving interval. For example, the total costs of lameness that were caused by digital dermatitis were 240\$, interdigital dermatitis 131 \$, and 152 \$ for ulcers per cow affected. However, the most important losses caused by lameness problems are milk loss, reproductive problems, and increase in culling rate and cure costs. The international rates of lameness incidence are estimated from 8% to 55% for New Zealand and North American, respectively. Generally, the incidence of lameness leads to a decreasing in milk yield (350 to 360 kg) in 305 days of lactation. The incidence of lameness mainly leads to increase in inflammation mediators in body, negative energy balance, long lying time and anestrus which as a result decrease in conception rate. In this particular retrospective study, data from 36805 cows in 8 years (from 2014 to 2021) is collected in Ghiam Company from Ferdows Pars Agriculture & Livestock Holding Company. Cows were divided to healthy and lame cases (infectious and non-infectious lameness existence in different parts of hoof). The cows were allocat-



ed to 4 different groups: 1- cows that showed lameness between parturition to 10 days before the first-service insemination; 2- cows that showed lameness between 10 days before the first-service insemination to the first-service insemination; 3- cows that showed lameness between the first-service insemination to 10 days after the first-service insemination; 4-cows that not showed lameness during the first-service insemination (control group). Results of our experiment showed the significant effect of lameness on the first-service conception rate and it reduced by 10.7 percent in lame dairy cows. The incidence of lameness in these periods did not significant affect first-service conception rate in the first and the second parities. Nonetheless, first-service conception rate was 10.3 percent lower for lame cows in the third and higher parities compared to the control. Days from calving to first service (DFS) in the first and second parity of the lame cows increased by 5.3 and 5.4, respectively. However, this criterion was increased for the third and higher parity cows to 6.4. Generally, DFS for the lame cows (all lame groups) increased by 5.6 days. Not only lameness had significant effect on the first-service conception rate in the third and higher parity cows but also they showed higher DFS. It seems that lameness control programs after parturition by paying attention to hoof health, bedding, and healthy nutrition and welfare in the transition period is crucial and it is proposed that since these cows are in their maturity and maximum production, it is more prudent course of action to provide them with more appropriate and specific welfare. Keywords: Cow, Reproduction, Conception rate, Lameness, Economic Loss

# **Oral Presentations of RCCCL**





## **Anatomic Evaluation of Axial Cut in Dairy Cow's Hoof Trimming**

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Hoof trimming consider as one of the continuous activities in dairy herds that is performed with the objectives like correcting weight distribution. The Dutch 5-point method, is still widely accepted and practiced around the world. In third step of Dutch method, horny tissue removed from specific region of sole, with the aim of removing weight bearing in this region (which is the common site of sole ulcer)<sup>1</sup>. This current designed to evaluate anatomic possibilities and outcome of this cut. Study was done on 12 mature cattle hooves obtained from Mashhad abattoir. Hooves were cleaned, numbered and stored in the refrigerator for 24 hours. Frozen samples were photographed by placing a scale (ruler) in lateral, medial and solar aspects. Samples were cut cross sectional by two-centimetre distance from the tip of the toe to the heel for up to 8 cm. Sagittal section were done on the contra digit in each limb. Cut parts were photographed using scale for measurement. Dorsal wall length, toe angle, sole length and width, heel and toe height and axial, abaxial, solar and transverse horn thickness at 2 to 8 cm cut was measured. Dorsal wall length recorded as  $96 \pm 12$  and  $99 \pm 13$  mm in medial and lateral claws. Thickness of horny tissue in the axial region recorded between 3 to 5 mm. Thickness of the transverse horn tissue decreases from the toe to the heel with 11 mm thickness at 8 cm cut and considering the minimum thickness of 5 mm in the regions around the heel resulted in possibility of up to 6 mm removal of the hoof around this region. Finally, the sagittal section shows that the flexor tuberosity of 3rd phalanx is at a distance of at least 98 to 102 mm



from the tip of the toe suggesting that routine axial cut technically will not help releasing pressure applied by flexor tuberosity of 3rd phalanx to the sole and this cut probably increase the ability of hoof to expand easier in walking and make horny tissue softer. Results of this study show that it is possible to perform axial removal or modelling from a distance of 2-4 cm from the toe tip to a maximum of 8 cm long and heel horn needs more protection because of its shallow depth.

**Keywords:** dairy cattle, lameness, hoof trimming, anatomy, horny tissue, thin sole

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## Evaluation of THI Index in Neishabour Synoptic Station Data During 1398-1400

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Annual milk yield per cow has increased more than 3-fold in the last 50 years. Heat production and in combination with compromised cooling capability because of environmental conditions resulted in heat load



in cows. Environmental factors including relative humidity, radiation, temperature, rainfall, wind speed and internal factors such as metabolic heat production listed as main cow's heat stress causes. THI index, the index based on relative humidity and environmental temperature, use to determine heat stress in dairy cows. In this study 8 formula of THI according to Neishaboursynoptic station data were calculated. Neishabour in the climatic country divisions is located in the central plateau and semi desert climate in northern parts with mild to cold weather and in the southern regions tropical weather and saline field. Neishaboursynoptic station is constructed near the Asian road (Neishabour-Mashhad Road) with 1213-meter height above sea level, 16 and 36 degrees of longitude and 48 and 58 degrees of latitude. Daily relative humidity, maximum and minimum temperature, wet bulb temperature, dew point temperature, direction and speed of wind during 1398-1400, descriptively were considered in this current study. THI calculated with 8 different formulas. Number of days with THI higher than 68 extracted from set of data. Result of the most common THI formula shows that in 1398, 1399 and 1400 total of 181, 182 and 198 days recorded as days with THI above 68 respectively. The first two consecutive days that THI was above 68 in the 1398, 1399 and 1400 recorded as 14 and 15 farvardin, 1 and 2 ordibehesht and 3 and 4 farvardin respectively. The first uninterrupted five days with THI above 68 in these years were 14-18 ordibehesht, 1-5 ordibehesht and 3-7 farvardin respectively. Start of THI above 68 that is considered as heat stress threshold for cows move forwarded during last 3 years. Providing of prediction maps about heat stress have many uses in the heat stress management in dairy cows.

**Key words:** THI, cow, heat stress, temperature, humidity

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the best indicator of heat stress in lactating dairy cows.

## **Prevalence of Claw Horn Lesions in Non-Lame Dairy Cows in Dairy Farms of Kermanshah Province**

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Lameness is one of the most important problems of cattle, particularly in the dairy herds. It has a significant impact on animals' health, welfare and production. lameness can reduce the reproductive efficiency and milk production, and increase culling rates. Though, lameness prevention has an important economic impact. Claw lesions are a major cause of lameness in dairy cattle. The aim of this study was to assess the prevalence of claw lesions in some healthy dairy herds in Kermanshah with no any documents of previous study in this field. To investigate types of hoof lesion, 752 healthy cows (score 1 and 2) from 2 dairy herds in summer and autumn 2014 were studied. Data collected during routine claw trimmings were recorded to predefined forms and included date of trimming, cow number, leg and claw on which the lesion occurred and type of lesions. The percentage of affected animals was 59% for heel horn erosion, that it was the most seen lesion. The other observed lesions were; white line disease (55.4%), double soles (45%), sole heamorrhages (39.8%), sole ulcer (5%), chalky white powdery sole horn 2.7%), horizontal fissure (1.1%), vertical fissure (1%), toe ulcer (0.3%) and heel ulcer (0.3%). In our study, 77.26% of all animals had at least one hoof lesion. The prevalence of claw lesion in the hind limb (62%) was higher than forelimb (38%) and in lateral claw of hind limb was higher than medial claw of hind limb. Some lesions may



resolve spontaneously and never cause lameness. Though, prevention and treatment of hoof lesions in non-lame cows can prevent the lameness incidence in non-lame cows that it is very important issue in herd health. To find a more accurate relationship between lesions and locomotion score, long-term studies should be performed to monitor lesions and locomotion score.

**Key words:** Dairy cow, Lameness, Hoof lesions, Locomotion score

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## Survey on Cow Comfort Indices in Some Large Dairy Herds With Free-Stall System in Kermanshah Province

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The aim of this study was to evaluate some welfare and comfort indices including; Cow Comfort Index (CCI), Stall Use Index (SUI) and Stall Standing Index (SSI) in some dairy cattle herds with free stall system in Kermanshah province. This study was carried out in three large dairy farms in Kermanshah province with free stall sys-



tem. These three dairy farms had about 450, 455, and 470 milking cows, respectively. In middle of each season and in each dairy, one hour after the evening milking one hour before the morning milking, the total number of cows and stalls in each hall and number of cows in different situations (resting in stall, standing in stall, eating, drinking and etc.) was counted and recorded in prescheduled tables. Then, the above mentioned indices (CCI, SUI and SSI) were calculated for each hall and in each season in the morning and in the evening in the 3 herds separately and documented in new prescheduled tables. Statistical analysis of the data was performed using SPSS software, version 18. The results showed some differences in CCI, SUI and SSI between the halls in each farms, but they were not statistically significant. Although; some differences between the seasons inside the farms and between the farms were statistically significant. In total of three dairy farms and for one-year study, the min of CCI, SUI and SSI were 79.6, 61.8 and 19.5 percent respectively. The present study showed that the amount of cow comfort indices in dairy farms of Kermanshah province are consistent with the findings of the other researchers, but they are not at desired levels. Therefore; further investigations are needed to find out the factors involved in this problem. The results also showed that farm managers in order to maintain livestock health and increasing the economic efficiency of the herds, should pay more attention to such issues that affect cow comfort including, stall designing, bedding, ventilation and etc.

**Key words:** Cow, welfare, comfort index, free stall

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## Evaluation of Freestall Design in Mashhad Dairy Farms

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Housing systems and design is selected depending on the farmer's needs, available knowledge, facilities and other necessities. Several major housing systems include pasture, freestall, tiestall and loose housing (Straw yards) barns. Freestalls were used to provide easier and better management, including easier management of manure, accessing higher density, better hygiene by separation of cows. Stall is a metal cubicle that is surrounded by two divider rails, a brisket board, a neck rail and is located about 20 cm above the ground level. Manure of the lying cows drop outside the stall, which keeps the cow clean and healthy. Current study was done to evaluate structure of freestalls in Mashhad dairy farms. Farms sampled by convenience sampling and based on the membership of farms in the dairy farmers cooperative unit of Mashhad, farms with more than 100 lactating cows were selected. Stall width, stall length, stall bed length, brisket board height, lunging space, neck rail height, length from rear crub to neck rail, rear crub height and diagonal distance of the neck rail were measured. In each barn 6-7 stalls were measured. The freestall sampling pattern was done according to the protocols of Dairy Farmers of Canada. Eighteen farms were selected, which only 12 farms were available and willing to cooperate. Among these, 9 farms were equipped with free stall system which were included in this study. Mean  $\pm$  SD (Centimeter) of these measurements are as follows: stall width ( $124.5 \pm 9.4$ ), stall length ( $252 \pm 17.4$ ), bed length ( $233.3 \pm 29.3$ ), brisket board height ( $11.2 \pm 10.8$ ), lunging space ( $82.7 \pm 25.5$ ), neck rail height ( $120.4 \pm 10.4$ ), length from rear crub to neck rail ( $169.8 \pm 20.1$ ), rear crub height ( $16.9 \pm 4.7$ )



and the oblique distance of the neck rail ( $203.3 \pm 13$ ). Almost average of all dimensions were within the standard range, except for the brisket board. More detail examination of the stall dimensions should be done in order to find any possible freestall design risk factor for cow lying and comfort.

**Key words:** Free stall, stall, stall length, neck rail height, lunging space

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## Detecting Claw Horn Lesions in High Locomotion Scored Cows

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Lameness is one of the most important health problems of dairy cows. Economic losses from lameness include reduced milk production, fertility reduction and reduced cattle economic life, and increased herd culling rates. For this reason, diagnosis and treatment of lameness in cattle is very important. Locomotion scoring system is one of the most practical methods in determining the severity, persistence and prevalence of lameness and is very important in early identification of lame



cows in the herd. In this current study, tracking claw horn lesions by locomotion scoring in one to three months before occurrence of the lesion were studied. Also, possibility of using locomotion scoring for prediction of claw horn lesion occurrence in the coming months were evaluated. Study was done in a dairy herd with 3400 dairy cows, 37 kg average daily milk production during 6-month period. Locomotion scoring with a 5-point scale were done on a monthly basis. Primiparous cows in a period of 6 months separated and divided it into two study and control groups. The study group include cows with claw horn lesions (areas 1, 2, 3, 4, 5, 7, 8, 11 and 12). The control group included cows in the same parity without claw horn lesion during study. Three consecutive locomotion scores during past three month were recorded in study group, and in control group, the last 3 months of the year considered as the time that three locomotion scores recorded before this time. The association between 4 or 5 scores (clinically lame cows) and claw horn lesions was evaluated with chi square or fisher exact tests. Lame scores one month prior to detecting lesion was statistically associated ( $p < 0.001$ ) occurrence of the claw horn lesions as cows with lame score had 12.1 odds for having claw horn lesions. Logistic regression analysis of locomotion scoring show that it could not use as a predictive tool for occurrence of claw horn lesions. ( $p > 0.05$ ).

**Key words:** locomotion scoring, sole ulcer, claw horn lesion, dairy cow

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## The Effect Of Lameness on Milk Yield in Dairy Cows

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Lameness is a recurrent and under-reported health and welfare issue, which causes economic losses to the dairy industry by decreasing cow performance and profitability. The objective of the current study was to evaluate the association between lameness and milk yield indices in dairy cows. The research was conducted on a dairy farm in Mashhad with 600 dairy cows, annual production of 39 liters and free stall system. Data about milk production indices including total milking days, total milk production and corrected 305-day milk production were extracted for all first-lactation cows with 0 – 200 days in milk (DIM). The selected cows (n=48) were divided into two groups lame cows (exposed) and non-lame cows (non-exposed) based on their locomotion score (five-point Sprecher system). In the first plan, the 37 cows with locomotion scores 1,2, and 3 selected as non lame group, while the lame group consisted of 11 cows with 4 and 5 scores. In the second plan, cows with locomotion scores 1 and 2 were considered as non-lame (n=32) and cows with locomotion scores 3, 4 and 5 were considered as lame (n=16). The effect of lameness on milk production indices was statistically analyzed for each group using the t-test (SPSS, version 26). In the first plan, the mean total milking days in the lame group was  $357 \pm 79$  days, versus  $381 \pm 88$  days in the non lame group. Total milk production in the lame group recorded as  $13760 \pm 3399$  liters, whereas corrected 305-day milk production was  $12121 \pm 1894$  liters; these values were higher in the non-lame group ( $14946 \pm 399$  liters, and 12224



± 1760 liters, respectively). Based on a t-test analysis, it was found that although the mean amount of total milking days, total milk production, and corrected 305-day milk production of the non-lame group were greater than the lame group, the difference was not significant ( $P > 0.05$ ). According to the t-test analysis, the results for the second plan were similar as well. Even though this study was conducted in a herd with full hoof and welfare care, the results showed a decrease in milk production of lame cows and an increase in lactation period of non-lame cows, which should be considered in lameness control programs.

**Key words:** lameness, dairy cow, milk production

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## Evaluation of The Effect of High Locomotion Score on Culling Rate in Cows

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Lameness is defined as clinical manifestation of painful disorders, mainly related to the locomotor system, resulting in impaired move-





ment or deviation from normal gait or posture. The severity of lameness vary from stiffness or decreased symmetry of limb movement to an inability to bear weight on a limb, or even total recumbency. Locomotion scoring (LS) is one of the early diagnosis tools for lameness, which aims to prevent, identify and effectively manage the cases that lead to lameness. This study was performed to investigate the effect of high LS of dairy cows in different days in milk (DIM) on culling of the same cows. A farm with 900 dairy cows, free stall barns and average annual milk production of 39 lit/cow in two years were selected. Retrospective cohort analysis of data on primiparous cows were used in this study. Cows in two groups of exposure (lame cows with scores 4 and 5 in at least one record) and non-exposed (score 1, 2 or 3 in the whole interval) in three different DIM (0-120 days, 121-250 days and 250 days and more) were enrolled in this study. LS on a monthly basis was performed using 5-point Sprecher method. SPSS statistics 26 software was used to evaluate the data by using chi square and fisher's exact tests, the difference between culling in the exposed and non-exposed groups was evaluated, p value set as 0.05. Relative risk of culling in the exposed and non-exposed groups was calculated with a 95% confidence interval. According to the results, high LS in cows with 0–120 DIM significantly resulted in more culling than non-lame group ( $P = 0.022$ ) the relative risk of culling in lame group recorded as 3.4 times more than non-lame group (1.4-8.5 95% confidence interval). The risk of culling for above 120 DIM was not significantly different between the exposure and non-exposure groups ( $p > 0.05$ ). The results of this study show the importance of preventing lameness on 0-120 DIM. Result of this study can be used as a base in economic studies on risk of lameness in the herds.

**Keywords:** dairy cow, culling, lameness, locomotion scoring

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# **Poster Presentations of RCCCL**





## **A Preliminary Evaluation Of A Limb Scale For Lameness Detection**

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Less weight bearing on a lame limb consider as a rule of thumb that can be measured by several complex methods, including pressure sensitive plates. This study was conducted for a preliminary study of a weighbridge device with four weight plates which was constructed to measure weight in each separate limb. Findings of this measurement may result in early detection of imperceptible and pre-acute lameness in cows. The digital scale was designed with four separate pressure plates, with separate display. The distance between these plates and its area is proportional to the distance of the bovine limbs that was measured previously. The weight on each screen is displayed individually with the unit of measurement of kilograms. In order to evaluate the performance of this weighbridge, in a experimental study, 26 lame cows with known lame limbs were selected in an industrial dairy farm. All cows had previously been examined and treated for lameness in one limb in a way that the limp limbs in these cows were quite clear. The cows were transferred to the weighbridge and simply after fixing on the scale, the weight of each limb was recorded from the display. The mean weight gained on healthy organs was  $178 \pm 19.12$  Kg and this number was  $104.21 \pm 33.98$  Kg on lame limbs. The device's ability to record weight in each limb is fully stabilized. One of the main problems of the device was severe shaking in such a way that with each movement of the cow, some weight displacement were recorded between the limbs, which should allow the animal to relax in the scale for a precise measurement. When the two front or rear limbs were lame, the device's ability to estimate limping is somewhat low. This is a preliminary study of the efficiency of this device, which will follow with further evaluations.



## Prevalence Of Lameness In Dairy Cattle By Season

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Lameness is one of the most important endemic diseases of cattle that has severe effects on their reproductive performance, milk production, and longevity. The aim of this study was to investigate the prevalence of lameness in different seasons and also to investigate the differences between their frequencies in different seasons in dairy cows. In this study, a sample of 619 cattle was selected from an 800 cattle industrial farm in Alborz province. Then the lameness of cows was divided into 5 degrees (including normal, unbalanced, mild, moderate and severe) according to Thomson (2008) ranking. The prevalence of lameness in each season was determined and the difference between them was measured using statistical tests. Based on the results of this study, it was shown that in spring, 98.1% suffer from first degree lameness and 1.9% suffer from second degree lameness. In summer, 98.3% suffer from first degree lameness, 0.8% suffer from second degree lameness and another 0.8% suffer from grade 4 lameness. In autumn, 92.7% showed lameness with grade 1, 2.5% lameness with grade 2, 1.8% lameness with grade 3, 1.8% lameness with grade 4 and 1.1% also showed lameness with grade 5. they give. In winter, 93.6% show lameness with grade 1, 1.7% show lameness with grade 2, 3.5% show lameness with grade 3 and 1.2% show lameness with grade 4. Also, the results of comparing the frequencies showed that there is no statistically significant difference between the amount of lameness in different seasons ( $P > 0.05$ ). Based on the findings of this study, it can be concluded that the amount of lameness in dairy cows is not affected by the season.

**Keywords:** Lameness, dairy cattle, season, endemic disease

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## **Histopathological Report Of Neurofibroma Tumor In The Motor Limb Of A Cow**

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Neurofibromas are slow-growing peripheral nervous system tumors that can occur in any part of the body where peripheral nerves are present. According to the World Health Organization (WHO) classification, these tumors were classified in two groups of benign and malignant. Several abattoir surveys of neoplasms in cattle have shown that bovine peripheral nerve sheath tumors (PNSTs) are among the three most common neoplasms in cattle. Neurofibroma is very similar to Schwannoma (tumor of Schwann cells in the nervous system) and microscopic studies are necessary for definitive diagnosis. In the present study, a grown mass measuring  $10 \times 10 \times 5$  cm, in the distal limb (near carpal joint), was observed in a six-month-old Simental bull, which was surgically removed. Topically, it was removed from the area and the sample was placed in 10% formalin for diagnosis and sent to the pathology laboratory. Sections prepared routinely were stained with hematoxylin-eosin and studied by conventional light microscopy. In terms of macroscopic morphology, the mass was soft, with a definite margins, and white to gray in which foci of bleeding were also observed. In microscopic studies, neoplastic cells were identified as a mass of spindle-shaped cells of neural origin, with a solid and wavy pattern, and a low pleomorphism and mitotic index, surrounded by connective tissue stroma and vascular hyperemia. Focal points of bleeding, necrosis, and secondary infection were also observed, possibly due to physical trau-



ma to the lesion area. Neurofibroma is a common and usually benign tumor of the peripheral nervous system and skin tissue in domestic animals that environmental pollution and physical trauma can exacerbate its pathological lesions.

**Keywords:** Neurofibroma, Peripheral nervous system, Morphology, Benign

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## The Effect Of Breed And Management System On The Frequency Of Horny Tissue Lesions In Foot Of Sheep

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Hoof is a complex structure and has a key role in health and animal production. Hoof lesions and lameness cause reduction in milk and wool production, infertility, increase treatment costs, malnutrition, and culling in livestock. Since most of researches have been focused on cows, therefore, this study was planned to investigate the effect of breed, and management system on the frequency of horny tissue lesions in the hoof of sheep in a region of Kermanshah province. To evaluate the frequency of lesions, the hooves of 200 sheep were trimmed during summer and autumn 2020, and all the observed lesions (sole ulcer, sole hemorrhage, heel horn erosion, white line diseases, toe ulcer, cork screw, poor quality horn, hoof crack, excess growth of lateral wall, heel expansion) were recorded in pre-designed forms. Among the



horny tissue lesions; hoof cracks had been affected by breed (Bakhtiari breed with 20%). Comparison between the two closed and open grazing management revealed no significant differences in lesions frequency, which can mainly be due to small number of trimmed animals and doing more hoof trimming in closed management system. Although, the results of this study showed that breed can affect hoof lesions in sheep, however more research is needed to provide sufficient information in this field for presenting better ways to prevent and control the lameness in sheep flocks in the future.

**Keywords:** Sheep, horny tissue lesions, age, management

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## Evaluation Of The Effect Of Age And Sex On Hoof Lesions In Sheep In Kermanshah Province

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The increasing development of the animal husbandry industry has resulted in increased problems, such as diseases and related complications. Lameness is one of the most important management related problems in animal husbandry, including sheep farming units. As more than 80% of lameness cases are caused by lesions of the horny tissue of toes, sufficient knowledge is essential about lameness and appropriate methods for its control and prevention. The aim of this study



was to investigate the effect of age and sex on the frequency of horny tissue lesions in the toes of sheep in a region of Kermanshah province. To evaluate the frequency of lesions, the hooves of 200 sheep were trimmed during summer and autumn 2020, and all the observed lesions were recorded in pre-designed forms. Among the horny tissue lesions of toes; excess lateral wall growth has been affected by sex (female with 50.6%), and heel horn erosion have been affected by age (ages 2-3 years with 20.4%). White line disease (ages 2-3 years with 29.6%), chalky horn (ages 4 and above with 76.9%), and excess lateral wall growth (ages 3-4 years with 66.7%) were shown significant differences. Sole ulcer (ages of 1-2 years with 11.9%) and hoof cracks (ages of 3-4 years with 15.2%) showed marginal significant differences and all the other disorders did not show significant differences. Although, the results of this study showed that age and sex can affect hoof lesions in sheep, however more research is needed to provide sufficient information in this field for presenting better ways to prevent and control the lameness in sheep flocks.

**Keywords:** Sheep, horny tissue lesions, age, sex

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## Evaluation Of Locomotion Score 3 Changes In Three Next Months

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In the current study the role of locomotion score in early detection of lame cows in order to prevent severe lameness was evaluated. Milking cows was scored based on Sprecher locomotion scoring system (5 points, with score 1 as the non-lame cow and score 5 as the severely lame cow) while walking out the milking parlor, in a dairy farm with 3400 dairy farms, average of 38 kg milk yield a day and free stall housing system. The cows with level 3 locomotion score were observed till 3 months after recorded score and the changes in locomotion score was recorded. 20.64% of score 3 cows in their first parity showed score 3, 60.02% shifted to non-lame group (score 1 and 2) and 19.32% shifted to clinically lame group (score 4 and 5) in the first month. In the second month these percentages were 44.2%, 35.81% and 19.96% respectively and the last month changes were 18.86% of cows remained score 3, 49.97% moved to non-lame group and 31.14% showed clinical lameness. In the second parity 25.43% showed score 3 again, 49.75% shifted to non-lame and 24.82% showed clinical lameness and in the cows with three parity and more these percentages were 23.16%, 26.85% and 49.97% respectively in the first month. This study showed that descriptively, unlike the primiparous dairy cows, in the first parity the locomotion score of moderately lame cows changed to non-lame group and can help to interpret the locomotion score results.

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## Prevalence Of Lameness In Industrial Dairy Herds In Central Part Of The Iran

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Lameness is one of the greatest constraints to productivity, health and welfare of dairy cattle. Therefore assessment of lameness prevalence is necessary to design controlling and preventive measures. Locomotion Scoring (LS) systems are useful in assessing the presence and severity of lameness in cows. There are limited studies evaluating prevalence of lameness in Iran. The objective of this study was to evaluate lameness prevalence in industrial dairy herds in central part of the Iran with a 5-point lameness scoring system and cows with  $LS \geq 3$  were categorized as lame.

This study was carried out in Tehran, Qazvin and Alborz provinces and the assessments were undertaken March through June 2022 in four industrial dairy herds. The prevalence of lameness was estimated using the number of cows with a locomotion score equal to or greater than 3 as the numerator and the total number of cows that were locomotion scored as the denominator.

Total of the 17355 cows have been scored and lameness prevalence was calculated as 17.82% (95% CI: 17.25-18.40). Lameness prevalence in farm 1,2,3 and 4 were 14.05% (95%CI: 13.29-14.84), 24.51% (95%CI: 23.22-25.84), 21.44% (95%CI: 20.15-22.79) and 9.58% (95%CI: 8.13-11.21) respectively.

Generally locomotion scoring of the dairy herd should be as a part of herd health programs to identify lame cows earlier and assess effectiveness of lameness treatments and preventative interventions.

**Keywords:** Lameness, Dairy cattle, Prevalence, Iran



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## The effect of high locomotion score on reproductive indices

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Studies show that lameness in early lactation has a negative effect on fertility and lame cows need more services for pregnancy. This study was classified into two groups of lame and non-lame in a farm with 600 dairy cows with an annual record of about daily 39 liters and a free stall housing system based on the status of lactation intervals between 0 and 200 in a cohort study. The lame cows were divided in two studies. In the first study, locomotion score of 4 and 5 were considered lame, and in second study, cows with locomotion scores of 3, 4 and 5 were considered lame, which were compared with the non-lame control group. Reproductive indices (open days, service per conception and days in milk) were extracted in each group and the groups were compared by T test. The mean of open days in the first study was 150 89.85 in lame cows and 128.56. 67.79 in non-lame cows. The mean number of insemination recorded as 2.30 1.05 in lame and 2.15 1.16 in non-lame cows that did not show significant differences ( $P > 0.05$ ). Open days



were recorded in the second study as  $139.8485.59$  in lame and  $119.45 \pm 84.95$  in non-lame cows and the number of service per conception recorded as  $2.09 \pm 1.07$  in lame and  $2.24 \pm 1.62$  in non-lame cows that did not show significant differences ( $P > 0.05$ ). According to the fixed voluntary waiting period (VWP) of 75 days, least services per conception of one and the days in milk of 305, One sample T Test show significant difference in both groups ( $P < 0.05$ ). The type of lameness classification does not seem to make any change in studied reproduction indices. Performing synchronization protocols and new reproductive management tools, an intensive hoof care program (using regular hoof trimming program, and hoof baths) and monitoring of cow comfort maybe a reason for such a results. Studying in a larger statistical population with better classifications will produce more reliable results.

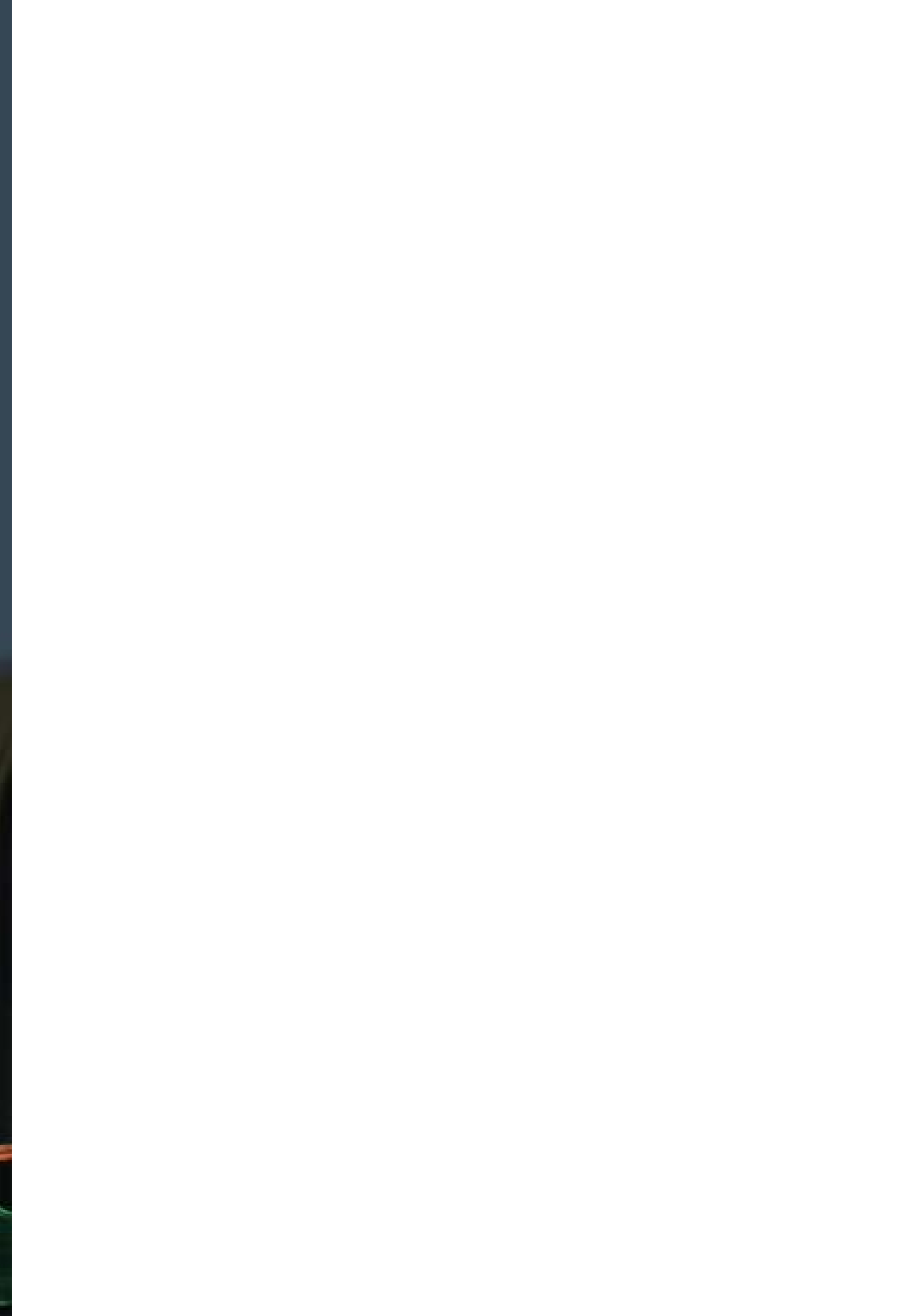
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# **Keynote Lectures Abstracts of ISVS and ISVSAD**







## **Therapeutic approaches and post operative complications in small animal cataract surgery**

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The opacity of the lens or its capsule which commonly known as cataract ,is one of the common reasons of visual impairment in small animals. The types of cataract can be classified in various ways based on the ethiology, the location of the opacity in the lens, the severity and time of its occurrence, etc.

Primary ( hereditary) cataracts have been identified in a wide range of dog breeds (about 125 breeds). The age of onset, the heritability pattern and the initial location of opacity in lens described in many breeds of dogs. In addition to hereditary causes (which in dogs may appear congenitally or juvenile or senior), other forms of cataract with metabolic etiology (diabetes, hypocalcemia, nutritional disorders, etc...), trauma, Inflammation or other factors such as toxicity and radiation are known, which are mainly called secondary cataracts.

Cataracts may be seen as one of the predictable consequences of some eye diseases such as progressive retinal atrophy ( PRA) or lens luxation or subluxation. In cats (and horses), except for the hereditary form, cataract is seen mainly as a secondary complication following the inflammation of the uveal tissue and the anterior chamber and it is different from dogs in terms of the course of the disease and the treatment approach.

Cataract can be seen in four Incipient, immature, mature and hyper-mature forms in terms of severity and involvement of different parts of the lens.

The animal's vision is normal in the Incipient and immature stage, depending on which part of the lens opacity, there may be a relative visual impairment, but in the mature and hyper-mature state, the animal will be blind. In the mature and hyper-mature, direct light reflection in the retina is not visible (negative retro illumination), but neuro-ophthalmic reflexes such as PLR and Dazzle are visible.



Cataract is generally associated with inflammatory damage to the uveal tissue, which is known as LIU or lens-induced (phacolytic) uveitis. Its prevalence has been reported in 71% of all dogs with cataracts. This statistic reaches 92% in diabetic dogs. Although the occurrence of this complication is seen in the eyes of most dogs who have cataracts, it can significantly lead to inflammatory complications after cataract surgery in patients who suffer from chronic mature and hyper-mature cataracts.

The only definitive treatment for cataracts is surgery, but regardless of the different etiopathogenesis of the disease in pets compared to humans, most animals in advanced stages (mature and hyper-mature) are referred for treatment when they are faced with serious vision defects.

These cases have created false beliefs about cataract surgery in pets, for example:

- Cataract surgery in dogs and cats is a very simple and quick procedure with few complications, just like humans
- Cataract surgery without using an intraocular lens is useless
- Except the phacoemulsification technique, other surgical methods do not help the animal's vision.
- If the surgical technique is performed correctly, the surgery will be successful in all cases and the animal's normal and permanent vision will be restored.
- Cataracts must be mature to be operated on

Regardless of the numerous and almost fruitless efforts that have been made in the last eight decades for the medical treatment of cataract, its surgical treatment has grown successfully since 1950. Surgical treatment with the aim of removing the cloudy lens not only helps to transmit light rays from the anterior chamber to the retina, but also prevents its long-term consequences such as uveitis and glaucoma by removing the tissue that causes inflammation due to the change in the protein structure of the lens.

This surgery in animals requires general anesthesia, microsurgery facilities, surgical microscope and sufficient experience of coordinated





teamwork to prepare the eye before surgery, control optimal conditions of the eye during surgery, and follow-up care after surgery.

Intracapsular, extracapsular, and phacoemulsification methods are three commonly known methods for performing cataract surgery in dogs.

Contrary to the general opinion based on the acceptability of the phacoemulsification technique, each of these methods can be selected and implemented for a specific type of cataract and the special conditions of the patient's eye.

The intracapsular method is a technique for removing the lens along with the posterior and anterior capsule completely and simultaneously through a large incision with a limbal approach, which is used in cases such as lens displacement, hyper-mature diabetic cataracts, except that in this method, the surgeon sometimes needs to perform vitrectomy. Complications caused by extensive trauma to the anterior chamber in this method may be seen months after the operation.

In the extracapsular method, through a relatively smaller incision than the previous method, the anterior capsule of the lens is removed, its opaque protein contents are removed, and while maintaining the structure of the posterior capsule, the anterior chamber of the eye is reconstructed with or without the use of an intraocular lens. This method has been used for many years and due to preserving the posterior capsule as a protection against the vitreous, it usually has more controlled side effects.

Phacoemulsification technique as a minimally invasive extracapsular method with an incision of less than four millimeters by creating a constant flow of fluids inside the phaco handpiece allows the entry of a special needle into the eye, which can be used to remove the lens crushed by ultrasound and removed by suction. For this purpose a part of the anterior capsule must be removed delicately and circularly, and then the operation of crushing and removing the hard nucleus of the lens is done with ultrasound and suction from a single channel, after the complete removal of the lens contents, the empty lens capsule is used as a bag to use the intraocular lens. Today, the foldable forms of



lenses, which have the ability to be introduced intraocularly from a 3.2 mm incision, are also available, and due to their low trauma and fast use, they have been more popular with veterinarians.

This technique, although it is known as a minimally invasive method with a small slit, but due to the high turbulence of fluids in the anterior chamber, it has the chance of causing edema and damage to the corneal endothelium, on the other hand, it requires high energy to crush the nuclei. Hardness of the lens may cause thermal damage to the sensitive structures of the eye and lead to irreparable damage to the delicate structures of the anterior chamber in displaced and unstable lenses.

In displaced and unstable lenses, it leads to irreparable damage in the delicate structures of the anterior chamber. Success in this technique, considering the different sizes of eyes in dogs, requires specific phycodynamic set up for each animal's eye, maintaining optimal intraocular pressure during surgery and coordination with general anesthesia.

However, with the progress and increase in the success rate of extracapsular and phacoemulsification in dogs in the early 1980s, and the use of intraocular lenses following phacoemulsification in medicine, the use of intraocular lenses in dogs was also considered by many veterinary ophthalmologist. After a short period of time, it became clear that the original human intraocular lenses (dioptric power 15-20) were not strong enough to be used in dogs. The intraocular lenses used today in dogs have a dioptric power of 40-42. They have specific sizes for small, medium and large breed dogs and are designed and manufactured by different companies for animal use. Despite which method cataract surgery is performed, performing post-surgery care and routine visits are to a large extent a guarantee of controlling post-surgery complications, although the occurrence of corneal wound infection after phaco surgery with a prevalence of less than two It has the lowest percentage in dogs compared to other methods, but the incidence of endophthalmitis as a long-term complication in dogs has been reported to be 0.2 to 1.4%, while the prevalence of this complication has always been reported to be less than 0.2% in many studies of human medicine.

Numerous studies have mentioned the occurrence of uveitis after surgery with the phacho technique with a prevalence rate of 29 to 82 per-



cent of dogs. In a study, the occurrence of uveitis after phacoemulsification surgery was confirmed by histopathology in 62 percent of patients. This issue proves the need to control the LIU before the surgery and its continuous and intense care in the days and months after the surgery.

The occurrence of ulcers by self trauma, especially in brachiocephalic dogs with a reported prevalence of 13%, reminds us of the need to use the Elizabeth collar in post-surgery care. The occurrence of intra-cameral bleeding as a complication with a short-term prevalence of 7-12% in the first three days after surgery necessitates a post-surgery examination.

Retinal detachment has a prevalence of one to two percent regardless of breed, but this complication has a much higher prevalence in Shih Tzu and Boston Terrier dogs. Damage to corneal endothelial cells with a prevalence of at least 4% and at most 25% in different studies may be known as a long-term complication of phacoemulsification surgery for up to ten years.

It is necessary to mention that the return of vision after surgery with or without lens implantation depends on the choice of surgical method and technique, under the influence of underlying factors such as systemic diseases (for example, the various types of retinopathy, controlled or uncontrolled LIU etc...), the presence or absence of glaucoma. At the same time and the degree of success in its control, the ethiology and the primary cause of the occurrence of cataracts, the occurrence of uveitis following surgery, corneal edema, short-term and long-term complications of surgery such as dry eyes, etc.

Recognizing that recovery of vision after surgery will not be lifelong in some patients may add a realistic dimension to pet owners' expectations of surgical success.

Obviously, if the principle is to perform all surgeries with the phacoemulsification technique, the more immature the cataract, the less time and energy is needed to crush and remove the lens. On the other hand, capsulotomy of the anterior capsule will be easier, but if with a with a luxated lens in an eye that shows symptoms of glaucoma, perhaps choosing the intracapsular method will lead to a better result.



In this case, the ripe lens has a smoother consistency and it seems easier to remove it at once.

Knowledge of the etiopathogenesis of cataract in different animals, true understanding of the course of the cataract in any animal, sufficient facilities and tools can lead to the success of the treatment team. The correct and timely use of ultrasound imaging techniques and electroretinography are effective in determining the prognosis and estimating the chance of surgical success regardless of the chosen method.

Veterinary surgeon who treat cataracts in animals by planning the surgical method should not only master all three surgical methods, but also should be able to perform effective measures for the patient's benefit by changing the surgical method when necessary during surgery. Adequate knowledge about systemic diseases and the selection of the appropriate patient with regard to concurrent diseases, being equipped with specialized tools for measuring and controlling intra ocular pressure in the pre- and post-surgery stages, and considering the patient's general condition and risk of anesthesia, along with the selection the right method (without relying on one method or prejudice on a particular technique) can increase the chances of success.

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## Management Of Colic In Horses: Indications And Decision-Making Risks

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Colic is defined as abdominal pain; it is a clinical symptom (syndrome). The most common forms of colic are gastrointestinal in nature (true colic). However, colic may be originated from other abdominal organs, without involving the gastrointestinal tract, which the affected horse reveals Colic Signs (false colic). In fact, colic continues to be at or near the top of the list of causes of death in horses. Colic is one of the most common emergencies faced by veterinarians. Since colic can be a life-threatening emergency, affected horses must be treated promptly for the welfare of the animal and to ease the owners' distress. Although it can be very difficult to reach a definitive diagnosis, especially during the first examination, a thorough examination should be performed in every case to determine which emergency treatments should be initiated and to decide whether the horse requires surgery or intensive care. Many horses will recover spontaneously or will respond to the first treatment. Since some horses will require surgery, making the decision regarding the need for surgery in a timely manner will increase the chance of a successful outcome, minimize patient morbidity, and potentially decrease complications. Early identification of critically ill horses that require surgery and rapid assessment for needed treatments are paramount for their survival.

The horse is being examined on a farm or stable for colic, the veterinarian must decide if appropriate treatment can be completed on those premises, or if the horse needs to be transported to a hospital facility for further diagnostic procedures or treatment. If the horse is in severe pain and exhibiting systemic inflammatory response syndrome, the examination may have to be shortened to allow initiation of the emergency medical treatments needed to stabilize the horse for possible transport to a referral hospital. Even if a horse is exhibiting mild signs, a thorough examination should be performed to ensure that a



more serious disease is not overlooked. With certain advanced diseases, including strangulating obstructions of the small intestine or small colon, depression may replace pain as the primary sign.

Through the combination of signalment, history, physical examination, and diagnostic procedures, the veterinarian must determine the source of the abdominal pain, the correct treatment strategy, the prognosis for recovery, and the estimated costs. Although a great deal of valuable information can be gained from an accurate signalment, medical history, and physical examination, a range of further diagnostic procedures are necessary to aid in this process. Presumptive diagnosis based on signalment, history, clinical observation and signs of pain are sometimes helpful in recognizing the cause of disease. Definitive diagnosis necessitates other facilities and recognizing of the accurate cause based on auscultation of the gastrointestinal tract, rectal examination findings, nasogastric intubation evaluation, findings of clinical pathology and abdominocentesis, and in case ultrasonography and radiography findings. Also, Endoscopy and laparoscopy are known as an Ancillary Diagnostic Aids for evaluation of the gastrointestinal tract and to confirm the need for an exploratory celiotomy or euthanasia in acute colic.

Cardiovascular parameters indicative of responses to circulating endotoxins increase the risk for several postoperative complications after an acute abdominal crisis. Thus, early referral of colic cases before developing of shock may minimize the risk of some postoperative complications. A critical aspect of the examination of any horse presented for colic is the assessment of the degree and persistence of signs of pain. The severity of pain is often related to the degree of intestinal injury, which is in turn related to the need for surgical intervention. Observation of the response to treatment with non-steroidal anti-inflammatory drugs (NSAIDs), spasmolytics (hyoscine), or sedatives is important when characterizing the type of pain. Mild pain typically responds to treatment for a period of 8 to 12 hours. In contrast, moderate pain will respond to analgesia for a limited period and requires repeated administration. Severe pain is manifested by violent behavior and may not respond to analgesia, which is frequently an indicator of the need for immediate abdominal surgery.



Following the examination and diagnostic procedures, there are three general options available for the management of the colic patient. In patients with a poor prognosis, the owner may elect to have the horse euthanized. In all other cases, the veterinarian must decide whether an immediate exploratory celiotomy is required or if medical management and further observation should be instituted. The decision to perform an exploratory celiotomy is largely based upon the ability to control pain and the abnormalities identified by physical examination and diagnostic procedures. Prompt surgical intervention is critical in maximizing the probability of a successful outcome, whereas a delayed exploratory celiotomy may result in visceral rupture or deterioration in the patient's condition. Therefore, surgery is often performed before a definitive diagnosis of the cause of the colic has been reached. An exploratory celiotomy is frequently necessary in horses with uncontrollable abdominal pain, even if other diagnostic procedures find no abnormalities. The presence of distended, hypomotile small intestine on rectal and ultrasonographic examination is commonly associated with the need for surgical intervention. Serosanguinous peritoneal fluid with an increased total protein and white blood cell count is an indicator of significant pathology and requires surgical exploration. The continued production of gastric reflux or deterioration in physical parameters including hydration status may suggest an exploratory celiotomy is necessary for both diagnostic and therapeutic purposes.

The preoperative management of the colic patient requires preparation to undergo anesthesia and administration of prophylactic antimicrobial and anti-inflammatory agents. Although an exploratory celiotomy is frequently an emergency surgery, it is important to attempt fluid therapy to address hydration status and acid-base and electrolyte abnormalities before anesthesia. Antimicrobial prophylaxis in the colic patient is administered to reduce the risk of incisional infection, septic peritonitis, and adhesion formation. All colic surgery is potentially clean-contaminated; therefore, preoperative administration of antimicrobials is recommended. If the colic patient has not already received an NSAID, flunixin meglumine (0.25–1.1 mg/kg IV) should be administered preoperatively to treat surgical pain and endotoxemia. Before surgery, a nasogastric tube should be placed to allow stomach decompression





during surgery as necessary. The horse's mouth should be rinsed to prevent aspiration of feed material during intubation. An indwelling urinary catheter should be placed and in male horses the penis should then be secured within the prepuce by suturing it closed. Overall, the experiences of surgical intervention in treatment of the horses with abdominal pain will be discussed in this session.



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## **Bone Healing Stimulation Techniques In Small Animal Orthopedic Surgery**

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### **Introduction**

Bones are organs of the skeletal system, providing shape, mechanical support, and protection to the body and facilitating the movement. In addition, bones contribute to the mineral homeostasis of the body and have recently been found to participate in endocrine regulation of energy metabolism. The well-known limitations associated with clinical use of autografts and allografts continue to drive efforts to develop bone graft substitutes, using the principles of biomaterials and tissue engineering.

Techniques used to improve the treatment of fractures by stimulating normal bone consolidation when there is a delay or when said consolidation is absent will be studied in this study. The objective of bone transplants and bone stimulation with platelet-rich plasma (PRP) or with substances that stimulate bone morphogenetic proteins (BMP) is to achieve faster bone formation to accelerate healing in small animal orthopedic surgery.

### **Bone transplants**

A bone transplant consists of a bone tissue graft from a donor to a recipient. It can be done using bone from a donor, which is called an allograft, or from bone from the same patient, which is called an autograft.

#### Types of bone transplants

Taking into account the type of bone being grafted, there are two types of bone transplants:

- Cancellous bone transplant.



## ■ Compact bone transplant.

### **BMP or PRP grafts**

Also called artificial osteoinduction, this refers to a stimulation technique for bone consolidation through the application of substances that simulate the BMP, such as the diboterminal alfa (rhBMP-2). The use of this substance in veterinary bone surgery is very recent and its function is to stimulate bone healing. The rhBMP-2 can be used in cases of non-union or as a preventive measure in comminuted fractures to accelerate healing. It is a liquid that once soaked in a substrate, similar to a compress, it can be placed in contact with the edges of the primary fragments. BMP strengthen healing phenomena and therefore accelerate bone formation

Another possibility to accelerate healing processes is to deposit platelet-rich plasma in the fracture site (PRP), it has been observed that platelet-rich blood extract possesses substances that favor revascularization and the activation of healing phenomena of the tissues. When these substances are deposited in the fracture site, healing phenomena are accelerated. The PRP can be mixed with cancellous bone to prevent possible complications that are inherent to comminuted fractures even if the fracture site is infected. In the case of delayed healing, they can also be inoculated percutaneously without having to intervene once again on the patient.

In overall the effects of bone healing stimulators should not be substituted deficits stabilization in a fracture site, they are only supporting biomaterials for bone healing enhancing [1-3].

**Key words:** Bone healing, Autograft, Allograft, BMPs, PRP

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## **Surgical And Non-Surgical Treatments of Urovagina in Dairy Cattle**

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The reflux of urine from the urinary bladder to the vagina and accumulation in the vaginal fornix causes the formation of a urine pool and has three degrees: mild, moderate and severe. The diagnosis of urovagina can be made through the rectal exam or speculum examination. Urovagina is mainly seen in multiparous cows, especially those with congenital or acquired structural defects in the pelvis and her external genitalia. Thinness, pelvic ligament laxity, dysfunction of the constrictor vestibuli muscle resulting from dystocia, ovarian cysts, Poor conformation, pneumovagina, bladder nerve paralysis during delivery, the presence of an ectopic ureter or urethra, cystitis or urolithiasis are other predisposing factors. The urine accumulation results in vaginitis and cervicitis. Eventually, urine may enter the uterus when the cervix dilates, causing chemical endometritis. These abnormalities combined with the spermicidal nature of urine increase the number of artificial inseminations and calving interval that ultimately reduce fertility in affected cows. In some cases that happen after parturition due to a decrease in body condition score, may resolve spontaneously as the body condition score improves. The ozone flush coupled with intracornual insemination presents an effective nonsurgical treatment option in dairy cows. Various surgical techniques have been introduced to treat this phenomenon in dairy cows and especially in mares that can be mentioned to Caslick operation, creation of transverse fold, Pouret technique, Modified Pouret technique, caudal extension of transverse fold, caudal urethral extension, modified caudal urethral extension and creation of circular fold. Admittedly each of these techniques has its complexities, limitations, and advantages at the same time. Early diagnosis, improvement of patient management conditions, selection of appropriate treatment method and necessary follow-up will increase the chances of success in the treatment of this phenomenon. Despite its



relative prevalence and the resulting economic losses, a few documents are available on this phenomenon in dairy cows.

**Keywords:** dairy cow, vagina, urovagina, surgical treatment

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## **Ventriculoperitoneal Shunt Placement for Treatment of Hydrocephalus in A Cat: Surgery and Outcome**

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Hydrocephalus is a neurologic disorder in dogs and cats. It means the presence of an excessive accumulation of cerebrospinal fluid (CSF) within the brain with subsequent dilation of the ventricular system. Basically, it is classified to congenital and acquired. The underlying cause of congenital hydrocephalus is often unknown. Congenital hydrocephalus is typically recognized in young toy-breed dogs about three months of age. The condition is much less seen in cats. Medical treatment decreases cerebrospinal fluid volume and production, however it offers only temporary palliation of clinical signs. In recent years, availability of shunt technology have allowed ventriculoperitoneal shunt placement to treat congenital hydrocephalus. This report described a ventriculoperitoneal shunt which was placed in a domestic shorthair cat, aged 15 months, following a diagnosis with computed tomography of congenital hydrocephalus. Clinical signs worsened in the last two months pre-operatively. These signs include severe ataxia, hypermetria, blindness, obtundation and behavioral change. Neurological examination revealed abnormal reflexes and affected cranial nerves. So, surgery was decided as the treatment of choice for the patient. A peritoneal catheter (PC) was placed intraperitoneally through a left lateral small laparotomy incision. The PC was subcutaneously tunneled cranially in a straight line. A ventricular catheter (VC) was placed into the right ventricle of brain. CSF flow through the VC was confirmed correct placement. The ventricular catheter was connected to a CSF flow control valve (FCV) which was secured to the PC caudally. Satisfactory positioning of the shunt was confirmed on postoperative CT scan. All of clinical signs were resolved during two months postoperatively. The cat is followed up on a regular schedule (the last one before writing this abstract is six months postoperatively) and no complication were not seen. However, complications are relatively common in



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this type of surgery based on scientific literature.

**Keywords:** Hydrocephalus, ventriculoperitoneal shunt, neurosurgery, cat.

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## **Deep Learning, Machine Learning and Artificial Intelligence in Veterinary Diagnostic Imaging**

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A simple definition of artificial intelligence is a branch of computer science whose main goal is to produce intelligent machines capable of performing tasks that require human intelligence. Artificial intelligence is actually a kind of simulation of human intelligence for computers, and artificial intelligence is actually a machine that is programmed to think like a human and has the ability to imitate human behavior. This definition can be applied to all machines that act like the human mind and can do tasks such as problem-solving and learning.

Artificial intelligence (AI) has been used in the medical sciences for several years, and applications are growing across specialties for nearly every aspect of care. One of the most potential and newest applications of artificial intelligence in medicine revolves around deep learning algorithms for diagnostic imaging.

Despite the fact that the value of computer-based systems in medicine has been recognized for years, with the introduction of medical diagnostic decision support systems in the 1990s, veterinary medicine has only newly begun to use artificial intelligence for diagnostic purposes.

Artificial intelligence has limited uses in veterinary medicine; however, it may be used to control diagnostic imaging or patient information. The use of artificial intelligence in diagnostic imaging expertise is becoming more important.

Many believe that artificial intelligence, often known as machine learning, has the potential to significantly impact radiology processes. Artificial intelligence has the potential to significantly improve radiologists' diagnosis and measurement. By supplementing reports with data from artificial intelligence systems, it is possible to significantly enhance patient care. Additionally, it enables the lowering of wait times for emergency patients and remote radiology.



Because of the availability of digital data, imaging is critical to accomplishing the aims of artificial intelligence in medicine. In the field of health care, data refers to digital information from patient records. There are MRIs, CT scans, radiographs, and ultrasounds accessible. Any previous diagnostic procedure is supplied to the radiologist for diagnostic reasons each time the patient is admitted to the hospital. The existence of objective facts is what makes radiology so attractive. Software developers and radiologists have considered how to make data collecting easier and how to use it in patients' medical records.

For vet radiologists, artificial intelligence and robotics will make interpretation more efficient. The more information a radiologist knows about animal history, the better the interpretation when analyzing imaging results. When evaluating an abdominal radiograph, for example, vet radiologists will have a better diagnostic interpretation if they know information regarding a sick animal's gastrointestinal symptoms or a history of urolithiasis.

Although there are known instances of AI pattern recognition systems, AI does not yet outperform humans in this area. Despite AI's proper pattern recognition capabilities, the results should be evaluated by a radiologist. One example is artificial intelligence's failure to distinguish between actual lesions and artifacts.

Artificial intelligence algorithms will most likely take many years to accomplish detection as effectively as humans. Around the world, numerous algorithms and products are being produced, and many individuals are working on various items.

As a result, even if artificial intelligence is used in radiology and robots analyze scans, this technology will not be able to replace radiologists in the future. Radiologists have additional options to use various diagnostic procedures thanks to artificial intelligence.

**Keywords:** Artificial Intelligence, Veterinary Diagnostic Imaging, Radiology

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## Osteochondrosis Dissecans and Its Importance in Horse

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The health of musculoskeletal system has a substantial role in determining the future performance potential of a horse. Lameness is the main causes of loss performance in young sport horses. Joint disorders are among the most prevalent problems in horses and considered as the causes of pain, lameness, poor performance, early retirement, and economic losses in athletic horses. Developmental orthopedic disease (DOD) is the term used to describe a variety of important disorder in growing horses. These include osteochondrosis (osteochondritis)/dissecans (OCD), subchondral bone cyst, flexural deformity, angular deformity, incomplete cuboidal bone ossification, physitis, wobblers syndrome, and juvenile osteoarthritis. Osteochondrosis is a common developmental orthopedic disease and is a major source of lameness in young horses, leading to decreased athletic potential. This disorder has become a major concern in the equine industry. The pathophysiology of osteochondrosis is complex. Osteochondrosis develops as the result of disturbance in the process of endochondral ossification during skeletal growth. The disturbance may eventually lead to the formation of a defect, semi-loose or even completely loose fragments within a joint, that this condition is described as osteochondrosis dissecans (OCD). Proposed etiological risk factors include trauma/exercise, growth rate, a large body size, vascular failure, dietary imbalance, endocrine factors, and genetic predisposition. Vascular failure at the bone-cartilage interface can cause to defect in blood supply that contribute to the pathogenesis of OCD. It has been recognized that biomechanical trauma and exercise precipitate the onset of clinical signs of OCD, that involve in formation, loosening and avulsing of OCD flap. Also, young horses with a rapid growth rate and large body size are more at risk of developing of OCD. Dietary factors are one of the most important of OCD risk factors. High intake energy and imbalance in trace minerals, can result in an increased incidence of OCD. Imbalance in certain hormones including insulin and thyroid hormones, involved in the development of OCD. Although the inheritance pattern of OCD is not well



defined, genetics can also be responsible for OCD. Different breeds of horses have different incidences of OCD and also different patterns of OCD in different joints indicate that genetics is an important factor for OCD. In addition, different molecular events have been described in OCD pathophysiology. Although OCD can occur in any joint on any part of the articular surfaces, but some joints and anatomical sites most frequently affects. The most common joints affected by OCD are the stifle, tarsus, fetlock, and shoulder. Lateral trochlear ridge of the femur and distal intermediate ridge of the tibia are the prominent sites for OCD in stifle and tarsal joints, respectively. The predilection site of OCD in fetlock joint is the distal sagittal ridge of the third metacarpal/tarsal bone. Shoulder OCD frequently affects the glenoid and the humeral head. OCD may occur unilaterally, bilaterally or affect different joints. Clinical signs of OCD can be appeared as early as 4 months of age, or may be noticed until 2 to 4 years of age as the horse begins training. Some horses with OCD do not show the clinical signs but may be identified coincidentally during radiographic examinations. Poor performance, joint distention, and lameness are the common clinical signs of OCD. These symptoms vary with the location and severity of OCD. Diagnostic imaging techniques such as radiography and ultrasonography as well as arthroscopy can be used to identify OCD lesions. The choice of treatment depends on a variety of factors, including the severity of clinical signs, the location of the OCD, and the age of the horse. Conservative treatments and arthroscopic surgery are used for management of OCD. Conservative treatments including rest, restricted exercise, intraarticular medication, and nutritional management may be appropriate for mild cases or when radiographic lesions are seen without clinical signs. Arthroscopy is recommended for horses with persistent clinical signs, unstable lesions, or loose osteochondral fragments. Removal, surgical debridement or repair the OCD fragments performed during arthroscopy. Prognosis for athletic performance is good to excellent for most horses with OCD that treated surgically. However, it depends on the joint location, the severity of the OCD, and the extent of damage to the joint. Early diagnosis and appropriate treatment prior to the premature degeneration of the joint are important to improve athletic performance. Nutritional balance, careful management of growing foal, controlled exercise, and screening program are should be considered for prevention and management of OCD. Awareness of OCD and its different aspect is essential in order to management of the



effect of OCD on equine industry.

**Keywords:** Osteochondrosis dissecans, Joint, Horse

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## **Considerations For Transferring the Results of Skin Wounds in Animal Models to Human Studies**

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Skin wound healing is a complex process, and our current understanding of this process is the result of decades of study in this field. In brief, this process consists of four stages: homeostasis, inflammation, proliferation, and remodeling. It is generally believed that repaired skin regains only 80% of its tensile strength after repair. Much of our current knowledge of the healing process is the result of animal studies, particularly rodents such as mice and rats. Also, every day, many therapeutic compounds and strategies are tested on animal models so that the results obtained from them are finally used in the treatment of human wounds. In addition to *in vivo* studies, to reduce the use of animals, various environments have been designed to investigate healing, which, despite obtaining positive results, due to the absence of various factors in the body, including endocrine effects, etc., still cannot completely replace the animal models. Despite the widespread use of animals in regenerative studies, the application of information from these studies to humans should be done with caution. For example, two very close species like pony and horse have many differences in the healing process. Even the healing process in the wounds of the distal parts of limbs is different from other parts of the body in horses. In addition to such differences, many human wounds, including foot wounds in diabetic patients and pressure ulcers, have many complications that, despite many efforts, there is no completely similar animal model for these types of wounds. Moreover, the following reasons can be mentioned: 1. Most of the wound models are related to acute wounds but challenging wounds in humans are chronic in nature, such as diabetic wounds. 2. Burn or diabetic wounds have ischemic conditions, while in wounds of animal models, despite the creation of ischemia, these conditions are often short-term. 3. Many animal models are developed in young animals, while chronic wounds in humans are often problematic in the elderly. 4. Considering the conditions and problems of work-



ing with animals, most studies are done on mice and rats, while the healing structure of these species has differences, such as high wound contraction, from humans. In addition, morphological, immunological, and genetic differences between humans and animal models make it difficult to generalize the findings of animal studies to humans. Accordingly, we point out the challenges in animal studies of wounds and their differences from human wounds.

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## **Effectiveness of nuchal ligament autograft in the healing of an experimental superficial digital flexor tendon defect in equid**

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Frequently flexor tendon lacerations are associated with significant blunt trauma to the tendon ends, precluding direct apposition of the tendon ends and also taking apart the two ends of transected tendon over time is considered as tendon defect. Repair of a tendon defect is a more difficult problem than simple repair of a ruptured or lacerated tendon. New treatments for tendon injury focus on regeneration of functional tissue at both the cellular and tissue levels. Relative similarity of the nuchal ligament fibers to the flexor tendon components, can introduce this structure as a scaffold in healing of tendon defect. Eight healthy donkeys were used in this experiment. The left forelimb's tendon was assigned as the nuchal ligament autograft and the right forelimb was allocated as the control group (without surgical intervention). During the two-stage surgery, a piece of funicular part of nuchal ligament (3×1.5 cm) was transected (standing sedation-neuroleptanalgesia: acepromazine-xylazine-morphine) and was implanted in the superficial flexor tendon defect (general anesthesia). Ultrasound assessment was performed on 1, 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, 330, 360, 390, 420, 450, 480, 510, 540, 570, 600, 630, 660, 690, 720, 750, 780, 810, 840, 870, 900, 930, 960, 990, 1020, 1050, 1080, 1110, 1140, 1170, 1200 days after surgery. Clinical and radiographic evaluations were performed on days 1, 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, 330, 360, 390, 420, 450, 480, 510, 540, 570, 600, 630, 660, 690, 720, 750, 780, 810, 840, 870, 900, 930, 960, 990, 1020, 1050, 1080, 1110, 1140, 1170, 1200. After euthanasia, eight specimens belonging to both forelimbs of four donkeys were allocated to biomechanical testing and other eight samples were assigned to light and electron microscopic studies. Weight-bearing in gait and trot were similar between the affected and unaffected forelimbs at the end of four months. Mild to moderate adhesion was detected in the palmar surface of superficial digital flexor tendon without any adhesion in the dorsal surface. There was no significant difference in the echogenicity and fiber alignment, respectively, on the 90th and 120th day after surgery ( $p \leq 0.05$ ). Although treatment with the nuchal ligament autograft significantly increased the maximum load (N) and yield load (N) as compared to those of



the intact tendon at 120 days post injury ( $p = 0.035$  and  $p = 0.009$  respectively), but the maximum stress was significantly lower due to increased cross sectional area. Treatment significantly amplified the diameter of collagen fibrils in the range of 70 to 130 and 130 to 250 nm ( $p= 0.001$ ) and significantly enhanced the collagen fibril diameter ( $p= 0.000$ ) and density ( $p= 0.000$ ) compared with the nuchal ligament. The density of elastic fibers was significantly lower in the injured treated tendon ( $2.18 \pm 5.71$ ) compared to the primary nuchal ligament scaffold ( $6.41 \pm 60.21$ ). The transplanted nuchal ligament was biocompatible, almost biodegradable, and effective in tendon healing. Peritendinous adhesion was still a great challenge. This transplant may be a valuable option in clinical practice. Despite the difference in the components of flexor tendon with nuchal ligament, this autograft was a suitable substrate for the newly regenerated tendon fibers without metaplasia occurrence or tissue rejection.

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## Hip Dysplasia Diagnosis and Management in Dogs and Cats

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Hip dysplasia is a condition that affects dogs very commonly and less frequently in cats. The disease is hereditary and developmental in nature. It is generally believed that hip dysplasia originates from joint capsule laxity that leads to abnormal development of the acetabulum and femoral head. Hip dysplasia is typically bilateral but can be seen unilaterally infrequently. Environmental factors such as obesity, diets high in calories and protein, and activity level have significant impact on clinical manifestation of the condition. Inevitably, hip dysplasia leads to degenerative changes in the hip joint with variable degrees of osteoarthritis (OA).

Skeletally immature patients typically experience pain as a result of hip joint laxity (capsular stretching, effusion, and acetabular rim microfractures). Capsular hypertrophy and activity modification may reduce the severity of the lameness, leading the owner to believe the condition has resolved only to see lameness “recur” as the pain of end-stage OA becomes apparent. The clinical manifestation of these signs can be variable in the degree and severity. However, common signs in the hind limbs in dogs with hip dysplasia include reluctance to jump or run, difficulty rising and sitting down, decreased exercise tolerance and stamina, and a “bunny hopping” or swaying gait. Cats can be more challenging to diagnose since most owners do not notice mild lameness and lameness in cats, by virtue of their normal behavior, is more difficult to identify, especially in unfamiliar environments such as in a hospital setting. Orthopedic examination findings in these patients can include pain on manipulation of the affected hip joint(s), reduced muscle mass of the hind limb(s), reduced range of motion, and a positive Ortolani sign (best evaluated under sedation).

Radiographs can confirm the diagnosis and assist in defining treatment options. In immature to young adults, specific radiographic imaging and grading methods can be used as a screening (i.e., OFA) and predictive (i.e., PennHIP) bedside tests. Both medical and surgical options for management of hip dysplasia exist. Medical management is often



only successful in mildly dysplastic patients with limited osteoarthritic changes and its palliative effectiveness may be lost as OA progresses. Medical management options include balancing the diet, weight management, physical rehabilitation and activity modification with short-term pain management. Pain management options for hip dysplasia in dogs and cats primarily centers on the use of non-steroidal anti-inflammatory drugs (NSAIDs). Although safe, there is little evidence to support the use of so-called Disease Modifying Agents such as glucosamine, chondroitin sulfate, green-lipped mussel, etc. but omega-3 fatty acids and polysulfated glycosaminoglycans may have some limited benefit.

Surgical options can be divided into curative and salvage procedures. The intent of curative surgical procedures in hip dysplasia is to reorient the acetabulum of patients that have not yet developed OA changes in the affected hips. This reorientation stabilizes the lax joint, greatly reducing the severity and rapidity of progression of the secondary osteoarthritic changes. These curative options in dogs include juvenile pubic symphysiodesis (JPS) and double/triple pelvic osteotomy (DPO/TPO). The success of these techniques relies heavily on early diagnosis of the hip laxity prior to 18-20 weeks of age for JPS procedure and around 10 months of age or less for DPO/TPO. Performance of these techniques in dogs older than these ranges, dogs with osteoarthritic changes, or dog with excessive laxity generally results in poor outcomes and should be avoided. No curative surgical options have been evaluated in cats at this time.

Once OA in the dysplastic hip has developed, the surgical treatment options become limited to total hip replacement (THR) and femoral head and neck ostectomy (FHO). The functional outcome after FHO in dogs and cats remains suboptimal despite historical misconceptions but generally improves limb function over the preoperative state. Proper surgical technique and aggressive physical therapy in the early post-operative period will improve the functional outcome of patients after FHO. Improvements in THR implant systems (i.e., available sizes, implant quality/design and surgical technique) have led to significant improvement in outcomes of dogs and cats undergoing this procedure with very good to excellent functional outcomes, return to full activity,





and resolution of OA-associated pain.

Due to the hereditary nature of hip dysplasia, designing focused breeding program and owner education are important steps in reducing the prevalence of this condition in the general population. Given the genetic foundation of this disease, identification and sterilization of dogs and cats that present with this condition can significantly reduce the incidence of this disease. In conclusion, hip dysplasia is a significant source of musculoskeletal dysfunction and pain in both dogs and cats. Early diagnosis of dogs with hip dysplasia can allow curative intent surgical procedures to stabilize the joint prior to development of OA. Both cats and dogs with advanced hip dysplasia with associated OA can benefit from salvage procedures. THR results in better functional outcomes than FHO.

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## **Innovation And Creativity in Veterinary Surgical Equipment**

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Creativity is the ability to generate new ideas through combining, changing and reusing them in a new composition and design. Sometimes, as a result of this combination and change, a very creative, prominent and excellent idea may emerge. Creativity can disrupt and reorganize our knowledge about a subject in order to find a new insight into the nature of that subject, but in general, a definition of creativity that includes all its aspects is very difficult due to its wide dimensions.

In surgery, especially veterinary surgery, individual and inherent talents and a sense of initiative and creativity are very valuable elements. Although performing surgery is an acquired and educational matter and is achieved by gaining experience and practice, but the capability and tools of creativity and innovation in it is one of the most important foundations of progress in providing new techniques. During surgery, there are cases that have not been seen in any book, and it is necessary to use personal experience and sense of initiative.

In veterinary medicine, the factor of creativity and innovation is closely associated with surgical work. The existence of two factors, techniques and tools, makes it possible to present new techniques and innovative and exclusive tools for new methods in the field of veterinary medicine with various creative maneuvers. The elements of the surgeon, the new technique and the invention of various devices related to surgery, create a creative and innovative treatment, the result of which, in addition to the treatment, is an exclusive style that differentiates the surgeons from each other, and the result of this process is obtaining diverse from surgery.

On the other hand, considering conducting research in animal models, veterinary surgery is like a bridge between medicine and medical engineering, and new techniques and devices can be tested first on animal



models and then applied to humans, and In this field, it is necessary for veterinary surgeons to have the ability of innovation and creativity to implement techniques or creativity in the design and operation of new devices.

There are various methods to cultivate creativity to look at issues with a new and technological perspective, and one of these methods is the principles of TRIZ.

In this speech, an attempt is made to open a new window about creativity in veterinary surgery, so that by expressing some of the new methods and patterns related to veterinary surgery in this field, it is possible to perform surgery with the two necessities of technique and equipment, which brings the spice of creativity. In this category, we examine the new methods of creativity and criticize them in the form of application in surgery.

Considering innovation and innovation in this field, things such as creativity in surgery, creative ideas in surgery, the method of creating and cultivating creativity related to surgery in a person, the world's view on the discussion of creativity in surgery, the role of veterinary surgeons in the field of creativity and education are necessary. It, the methods of recording and exclusivity of creativity in surgical techniques and tools, examples and examples of creativity in surgery, individual characteristics of creative surgeons, barriers to creativity in surgery, selection and selection of creative assistants in surgery and discovering their talents and others related matters should be discussed and evaluated as a new beginning and work.



## **Clinical Description, Diagnostic Findings and Outcome of Five Surgeries on The Four Pet Animal Cases with Intracranial Space-Occupying Masses**

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Intracranial space-occupying masses can originate from the brain, meninges, or skull and cause a variety of signs by putting pressure on the brain.

Brain tumors in pet animals (dogs and cats) have a low prevalence. However, these tumors develop in more than 95% of cases (especially in dogs) after the age of 5 years. The most common brain tumors are meningiomas, with a prevalence between 33% to 49%. Other tumors, in order of prevalence, include astrocytoma (13%), tumors of brain ventricles (10%), pituitary tumors (10%) and oligodendroglioma (4%).

Osteochondrosarcoma, which mainly originates from bone or cartilage, is the most common skull mass that can reduce intracranial space and increase the pressure on the brain.

Clinical signs caused by intracranial space-occupying masses differ based on their location, extent and growth rate, but the main ones are: va-



gus sign, headache, decreased activity and convulsions.

Diagnosis is based on history, clinical signs, and physical and neurological examinations. Radiological imaging is helpful in the case of skull tumors, but in the case of brain tumors, more advanced diagnostic techniques such as CT-Scan and MRI are required.

The treatment plan for these patients is to remove the tumor (resection) or reduce its size (cytoreduction) and control the secondary effects caused by the tumor. Treatment options are conservative or aggressive. Conservative treatments are corticosteroids and seizure control drugs. In contrast, invasive treatments are surgery, radiotherapy, chemotherapy and immunotherapy.

The prognosis of patients with intracranial space-occupying masses is different. And it depends on the severity of the neurological signs, the number of white blood cells in the cerebrospinal fluid and the number of involved foci.

In this report, five surgeries were performed on four patients (one case was operated twice) with intracranial space-occupying mass, and their results are described.

These patients include an eleven-year-old dog with a pituitary adenoma tumor, a two-and-a-half-year-old dog with a very large skull osteochondrosarcoma tumor, a six-month-old dog with an ependymal cyst and a cat with multicentric meningioma. Most of these surgeries, which were performed in a multidisciplinary (MDT) collaboration between veterinary surgeons, neurosurgeons, otolaryngologists, and neuroscientists, are being reported for the first time in Iran.



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## Massage Therapy and Increase Performance in Horses

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Massage therapy is a holistic approach to the disease. In holistic medicine, all the various factors affecting both the internal and external environment of the patient, including emotional stability, lifestyle, nutritional balance, exercise, hygiene programs, structural soundness are considered.

Massage therapy is the manipulation of the soft tissues of the body in order to achieve specific goals of: drainage, relaxation, stimulation, and resolving muscle-related problems such as trigger points and stress points. It also increases our emotional bonding with the animal (esp. young horses).

### The main effects of massage:

- a. Mechanical effects
  - ✓ stretch the tissues and drive the fluids (arterial, venous, and lymphatic) in the direction of the movements.
    - Better tissue oxygenation
    - Good metabolism
    - Removal of carbon dioxide
    - Lowered blood pressure
  - ✓ Release of Endorphin
    - ✓ Stretch and soften the tissues
  - release muscle tension, contractures, trigger points, stress points, and spasms, eventually breaking down collagen fibers (scar tissue).
- b. Pure Nervous Reflex Effect
  - ✓ Soothe and relax a horse that is in a state of general tension, anxiety, shock, or pain





## Massage Moves

There are eight essential classes of massage moves:

- ✓ Stroking
- ✓ Effleurage
- ✓ Petrissage
- ✓ Shaking
- ✓ Vibration
- ✓ Friction
- ✓ Nerve manipulation,
- ✓ Tapotements
- ✓ A multitude of combinations

## Some Massage Do's and Don'ts:

### *Do's:*

- Do evaluate the horse's health by checking his vital signs
- Do work in a large space, free from obstacles. Remove distracting objects such as boxes, shovels, blankets, and ropes.
- Do maintain a soothing atmosphere: not too much traffic, not too many noises.
- Do have somebody hold the horse by the halter or the lead rope.
- Do clean your horse before starting a massage.
- Do keep talking to the animal throughout the treatment.
- Do pay attention to feedback signs from the ears, eyes, feet, tail, etc.
- Do keep records of your observations and the types of treatment you give.
- Do establish a treatment and exercise schedule for the following weeks, or until recovery.

### *Don'ts:*

- Don't disregard the physiological signs of contraindications.
  - Don't work in a narrow space. This is dangerous if the horse



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suddenly moves or panics due to outside influences (loud noises, falling objects, storm, etc.).

- Don't stand between a horse and a wall as you work because you can be squeezed.
- Don't allow loud music, commotion, or smoking, especially when dealing with an auditory animal.
- Don't allow cats, dogs, or other pets to wander around your work area. Prevent that intrusion before starting treatment.
- Don't work a dirty horse—one with mud or manure on his body.
- Don't work hastily, too quickly, or too forcefully.
  - Don't wear jewelry, have long fingernails, or wear heavy perfume.
- Don't be angry or in a bad mood when working on the horse, and don't think negatively.



## **Colic Surgery Challenges in Horses: Surgery and Post-Operative Care**

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The numerous challenges that exist in the field of equine colic surgery are not hidden from anyone who works in this field. Since colic is the most common cause of horse death, it is of particular importance to pay attention to this disease. A horse's chances of surviving colic surgery have improved greatly during the past 35 years. Advances in the field of anesthesia and how to perform surgery and knowledge of veterinarians and clients in the timely referral of colic to surgery have increased the chances of recovery of horses after colic surgery. Survival was significantly correlated to type of colic, complications during and after surgery. The most common complications include post-operative ileus, post-operative colic, incisional (wound) infection, incisional hernia formation, jugular thrombosis, diarrhea and laminitis.

Post-operative ileus occurs when the intestines do not work properly and is common in horses, especially after colic surgery on the small intestines. This condition is most common 24 to 48 hours after surgery and may occur for various reasons such as inflammation of the intestines. In this situation, the use of intravenous fluids and intravenous injection of lidocaine can help

Post-operative colic is a common complication after surgery that may occur days or months after surgery. In many horses, it is a temporary complication and can be resolved with analgesics, and in cases where they are repeated and severe, it should be considered serious that there may be a need for another surgery or even euthanasia. For better control and management of these situations frequent colic checks to assess gut motility and no feed until there is good evidence that gut motility has returned

Incisional (wound) infection is a relatively common problem and has been reported in different regions between 7 and 40 percent. Antibiot-



ics are given before and following surgery and the surgery site is protected during recovery from anesthesia and once the horse is back in the stable with an abdominal (belly) bandage for the first few following colic surgery from different hospitals worldwide

Incisional hernia formation is relatively uncommon in horses after colic surgery and may occur in horses with severe infection in the area of the surgical incision. In this case, the abdominal muscles do not heal properly and the size of the hernia may be from a few centimeters to the entire area of the colic surgery incision. Many hernias are not obvious to see and do not cause the horse any problems. However, if the hernia is very large and bulges a long way below the abdominal outline, surgery may be required 4-5 months later.

Jugular thrombosis occurs when this vein is blocked and sometimes severe infection may occur in this area. Unfortunately, this condition is more common in horses that suffer from severe endotoxemic symptoms. If the veins on both sides of the neck become completely blocked, it can be life threatening. To manage this complication early referral for surgery is essential to prevent severe endotoxic shock developing. All intravenous catheters are placed in a sterile (clean) fashion and are monitored very carefully during the post-operative period.

Fortunately, diarrhea after colic surgery is uncommon. However, some horses are more likely to develop this condition (e.g. sand impactions), and severe diarrhea can be life-threatening. Rarely diarrhea may develop as a result of infection by the bacteria *Salmonella* or *Clostridium difficile*. In these cases, great care is taken to ensure that affected horses are treated appropriately and to ensure that infection is not spread to humans or other horses. Fluid therapy and the use of analgesics and in some cases the prescription of special antibiotics can cause improvement.

Laminitis is relatively uncommon in horses recovering from colic surgery. In horses that suffer from severe endotoxemia before and after the operation, the risk of disease is higher. In such cases, the use of ice on their feet and the prescription of analgesics and foot support may be required



Although a detailed look at the different aspects of colic in horses is not possible in this symposium, but starting this discussion in such gatherings where veterinary professors and students are present can be the basis of progress in increasing the chances of survival of horses after colic surgery.



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## Emergencies in Small Animal Dentistry

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Generally, emergency conditions in dentistry are caused by a trauma to the face, teeth and oral tissues. Most of these conditions are not life-threatening, but they can be accompanied by pain, discomfort, and systemic complications. Therefore, they necessitate immediate treatment. In this lecture, dental emergencies and their symptoms, diagnosis and treatment required definitive care will be discussed.

### Fractured teeth

Fractured teeth always require treatment, however in general, only clear cases of complicated crown fracture will be presented to the emergency room. These are typically fresh tooth fractures following a fight, hit by car, or chewing on a hard toy or bone. Dental fracture is accompanied by discomfort, pain and sometimes infection. The patient may or may not be demonstrating signs of oral pain, but this is definitely a painful situation. According to the extent of fracture, fracture categorized either uncomplicated which the pulpal cavity is intact or complicated which pulpal system is exposed to the environment. Depending on fractured structures and time last from the event, vital pulp therapy, root canal therapy or extraction are options for treatment of dental fractures. They do however; need pain management regardless of clinical signs. Fresh fractures of strategic teeth should be referred to a veterinary dentist for treatment ASAP.

### Abscessed teeth

like humans dogs and cats suffer from dental abscesses. Although a dental abscess can occur in any infected tooth, the most common occurrence is due to the fracture of the fourth premolar tooth of the upper jaw, which is the largest tooth of the maxilla and is called a slab fracture and may lead to oro-facial fistula. A lot of time may have passed since the tooth became infected, but the patient recently showed clinical symptoms. If such abscesses occur in the lower jaw, they usually create a fistula on the skin under the mandible. Clinical symptoms



include swelling of the face at the site of the abscess, which should be distinguished from any other condition that causes swelling of the face. The tooth or the remaining parts of the tooth root are broken or pulled, or the foreign object causing the abscess must be removed from the oral cavity. Emergency treatment is necessary to reduce the pain and severity of infection in cases of dental abscess. Emergency treatment is directed at relieving the pain and decreasing the amount of infection. Note that once drainage has been established, the pain has decreased. Unfortunately, in many cases, only the wound is washed, while the main problem in the mouth still persists. Definitive treatment options include complete extraction or ideally root canal therapy.

### **Luxated/avulsed teeth**

This is one of the true dental emergencies, as saving these teeth is very time dependent. Dental avulsion is separation of the tooth from the bony alveolus due to an impact. Following facial trauma, chewing on cages, or fighting, luxation or avulsion may occur and the tooth may either remain in the dental socket and only become loose (tooth luxation) or it may be completely separated from the surrounding tissues (tooth avulsion). These cases should be referred to a veterinary dentist ASAP for replacement and stabilization. Skull X-rays are recommended to observe the root of the broken tooth left in the alveolus. The treatment includes the prescription of analgesics and temporary jaw muzzle. The highest treatment success in stabilizing an avulsed tooth has been reported 30 minutes after causing damage. At least 4 to 6 weeks are required to fix the loose tooth in the alveolar cavity. However, at this time, or at time of splint removal, a root canal will be necessary on the affected tooth. It is necessary to perform root canal treatment at the time of its stabilization.

### **Jaw fractures**

Jaw fractures are a fairly common referral in emergency rooms, and are typically caused by significant trauma. However, a subset of mandibular fractures is due to weakened bone. These are called pathologic fractures and most commonly result from advanced periodontal disease. However, pathologic fractures can also occur secondary to neoplasia or cysts. Distortion of facial symmetry can also be observed. Severe pain sometimes prevents a thorough examination, therefore, to



perform a complete examination induction of anesthesia may be required. It is necessary to fully evaluate the patient in terms of the presence of other injuries such as diaphragm rupture, pneumothorax, skull fractures, brain injuries, etc. Skull radiographs along with intraoral and dental radiographs and even CT scan are useful to make accurate diagnosis. Pathologic fractures should be suspected in older small breed patients with a distal mandibular fracture and lack of a history of trauma +/- lack of perceived pain. It is critical to note that these fractures will not heal unless the diseased tooth/root is removed. This should center on pain control as well as managing any other systemic issues. Support for the jaw with a tape muzzle or a loose nylon muzzle should be provided until definitive therapy can be performed. Depending on the type of fracture, surgical therapy is required to reduce and fix jaw fractures. Plates, wires, and KE apparatus can be used, however veterinary dentists generally use intraoral acrylic splints. This is much less traumatic than implants for this procedure.

Lip avulsion and other lacerations of oral tissue, caustic burn wounds, uremic stomatitis and various types of cleft palate are also considered as emergency cases that require immediate treatment. If the emergency cases are treated in their golden period with the intervention of veterinary specialists who have special expertise and knowledge, it often causes a rapid return of dental and oral function especially oral eating in the affected animal.





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## Propofol anesthesia in cats

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Propofol, as an IV anesthetic, is commonly used in small animal anesthesia to induce dose-dependent effects, ranging from sedation to general anesthesia. It is formulated as macroemulsions with %10 soybean oil, %2.25 glycerol, and %1.2 egg-lecithin, and the pH is adjusted to approximately 7.5 with sodium hydroxide. The commonly available formulation has no preservative and discarding the container within 8-6 hours of first use is recommended to minimize microbial or fungal contamination and endotoxin production. Propofol is primarily used to facilitate a short period of restraint for nonpainful or minor procedures (e.g., ultrasound evaluation, bandage change, upper airway examination) or as an anesthetic induction agent to facilitate intubation before maintenance with inhaled anesthetics. If used for painful procedures, analgesic drugs (e.g., opioids,  $\alpha 2$  agents) are recommended to reduce dose and/or provide analgesia. Propofol causes vasodilation and a decrease in cardiac contractility, cardiac output and arterial blood pressure, minute ventilation, and intracranial pressure. Propofol undergo rapid tissue uptake, is primarily metabolized by the liver and there is also extrahepatic uptake in the lungs. Propofol can be used in cats with hepatic or renal disease. Propofol can be used in cats with hepatic or renal disease and in cats with glaucoma as long as the cough reflex is minimized during intubation. Propofol may be an induction agent of choice for cats undergoing cesarean section because it has minimal effects on neonatal viability at delivery. There are some concerns regarding the safety of propofol in cats. Cat's limited ability to glucuronidate may cause prolonged recoveries following propofol infusion. Heinz body anemia, general malaise, anorexia, and diarrhea have been reported with sequential daily administration in cats. Therefore, any attempts to reduce the dose of propofol may be beneficial as it can minimize the adverse effects.

Proper sedation (premedication) and the addition of benzodiazepines (midazolam or diazepam) or ketamine (so-called "ketofol") to anesthetic induction protocol often reduce the dose requirement and have the potential to reduce side effects associated with high dose propofol administration. Cats will require higher induction doses on a mg/kg basis compared with dogs and complete recovery to ambulation



may takes longer in cats as compared to dog (30 vs 20 min) after an anesthesia induction dose. Propofol may be an induction agent of choice for cats undergoing cesarean section because it has minimal effects on neonatal viability at delivery.

Propofol should be used judiciously in feline anesthesia, especially when used as repeated doses or continuous infusion in order to reduce unwanted side-effects in this species.

**Keywords:** propofol, anesthesia, cat

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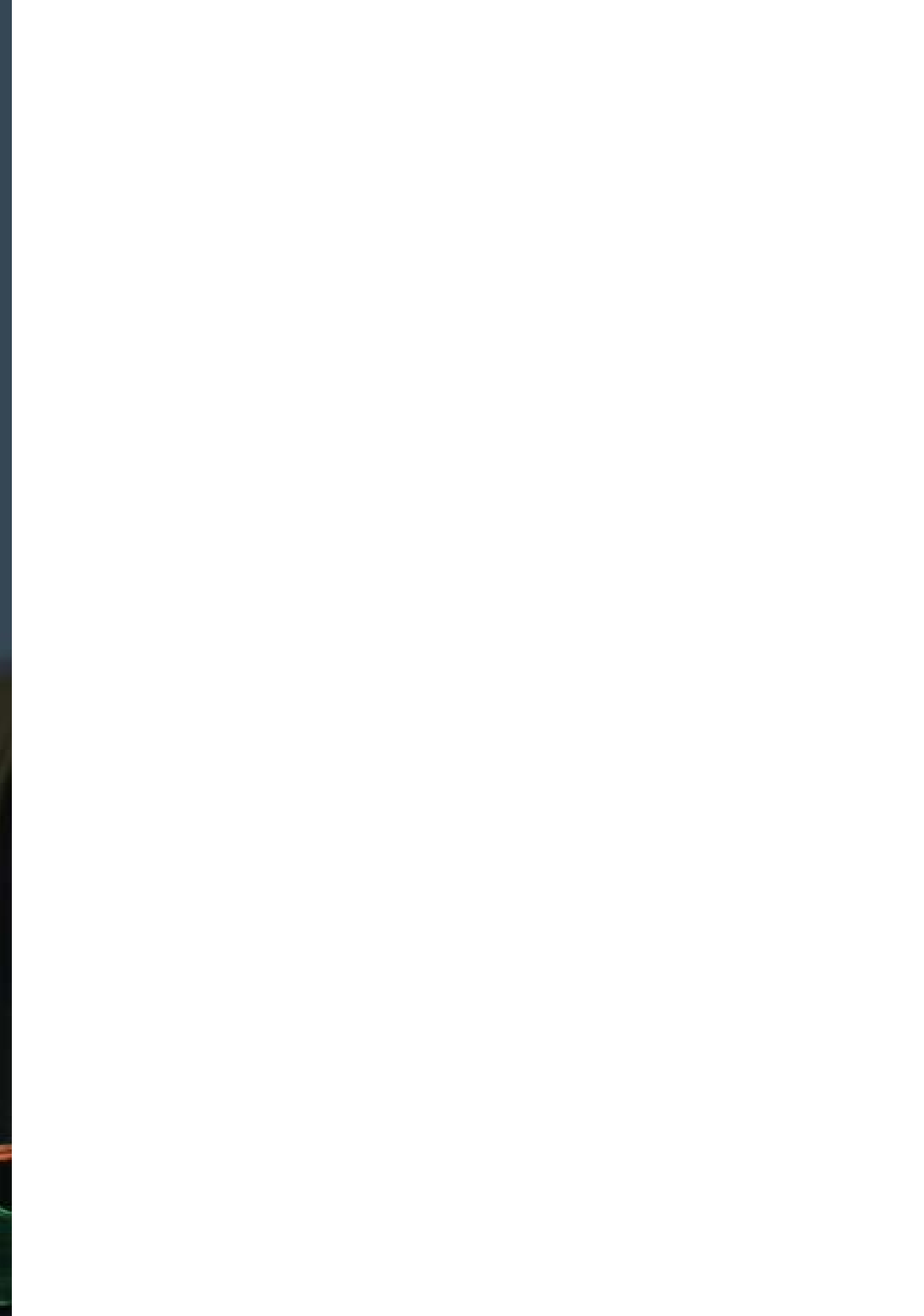
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# Oral Presentations of ISVS and ISVSAD







## **Evaluation Of Effects Of Combination Of Xylazine-Acepromazine And Vitamin C On Sedation, Physiologic Indices And Echocardiographic Parameters In Horse**

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Agonists of alpha-2 are categorized as sedatives and tranquilizers. These agents are used as chemical restraint and premedicate in small and large animals. Ascorbic acid physiologically modulates the nervous system and in excessive doses mimics amphetamines effect on central nervous system. The present cross over study was aimed to evaluate the effects of Evaluation of effects of combination of xylazine-acepromazine and vitamin C on sedation, physiologic indices and echocardiographic parameters in horse. The animals were assigned into two treatment protocols of Xylazine (1 mg/kg, IM)- Acepromazine (0.05 mg/kg) and Vit C 20 minutes pretreatment before xylazine (0.1 mg/kg, IM) - Acepromazine (0.05 mg/kg). Behavioral signs, onset of sedation, onset of maximum sedation, duration of maximum sedation, total duration of sedation, degree of sedation, ECG, MAP, hear rate, respiratory rate, rectal temperature and intestinal motility were recorded 5 min before and 5, 15, 30, 60 and 90 min after xylazine acepromizaine administrations. The animals in second treatment protocols showed significant difference in onset of sedation, duration of maximum sedation ( $P<0.05$ ). No significant differences were observed in Behavioral signs and ECG parameters ( $P<0.05$ ). The present study indicated vit C potentiated the sedative effects of xylazine-acepromazine in horse.



**Keywords:** Sedation, echocardiography, vitamin C, xylazine-Acepromazine, horse

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**Evaluation Of Biofilm Production Ability In Bacteria Isolated From Endotracheal Tubes Used In Small Animal Surgery**

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General anesthesia is a common practice in veterinary clinics and inhalation anesthesia using endotracheal tubes is considered as an essential part of this process. Epidemiological studies have shown the role of anesthesia equipment in infections following surgeries in human medicine. Intubation with endotracheal tube is usually performed to provide supplemental oxygen and inhalation anesthesia and to help prevent aspiration during general anesthesia. Researchers believe that endotracheal intubation is one of the most important causes of bacterial transmission to the respiratory system and development of pneumonia. Biofilms are microbial communities that attach to living or non-living surfaces and are surrounded by extracellular polymeric materials. Biofilm has become a concern in therapeutic places because of its potential role in infections that caused by medical devices. In particular,



ventilator-associated pneumonia (VAP) is a common intubation-related infection that occurs during mechanical ventilation or inhalation anesthesia processes and is associated with an increased risk of death and additional costs to the health care system. However, not much information is available in veterinary medicine. The aim of this study was to evaluate the level of endotracheal tube biofilm contamination in small animals. In this study, 15 used endotracheal tubes from small animal surgery unit of Ferdowsi University of Mashhad teaching hospital were examined. Swab Samples were cultured on McConkey agar, chocolate agar, mannitol, salt agar and cetrimide agar. The samples were incubated at 37 ° C for 48 hours. The ability to produce biofilms of isolated bacteria was evaluated by microscopic and microplate observation methods. In direct culture method, 9 out of 15 endotracheal tubes recorded as positive. In the evaluation of biofilm production by microscopic method, 7 out of 11 endotracheal tubes recorded positive and in the microplate method, two positive samples, two weak samples and 7 negative samples were found. According to the results of this study, anesthesia equipment can cause the transmission of microbial contaminants to the respiratory tract, and since microbial biofilms are not destroyed by conventional disinfection methods and play an important role in antibiotic resistance, the presence of these contaminants in anesthesia equipment and devices is a serious risk to animal health in the surgery section.

key words: Biofilm, Endotracheal tubes, Anesthesia equipment, small animal

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## Clinical Evaluation of Different Anesthetic Methods Following Co2 Pneumoperitoneum in Dogs

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General anaesthesia and pneumoperitoneum are the two main components of laparoscopic surgery. The aim of this study was to evaluate the effects of anaesthesia on monitoring parameters during Co2 pneumoperitoneum in dogs.

Twenty mixed breed adult dogs were randomly divided in 4 groups: propofol and mechanical ventilation (group PM), propofol and spontaneous ventilation (group PS), isoflurane and mechanical ventilation (group IM), isoflurane and spontaneous ventilation (group IS). The dogs premedicated with acepromazine, morphine, and diazepam respectively. Anaesthesia was induced with propofol in all subjects. After tracheal intubation, anaesthesia was maintained in groups PM and PS by intra venous propofol, and in groups IM and IS by isoflurane in oxygen while the subject's lungs were mechanically ventilated in groups PM and IM. Pneumoperitoneum was induced in all subjects and IAP was maintained at 15 mmHg for 40 minutes. During anaesthesia, clinical monitoring including: Blood gas analysis, heart rate, respiratory rate, invasive blood pressure, SpO<sub>2</sub>, temperature and ET CO<sub>2</sub> were done. Data analysis was performed using SPSS software and P values less than 0.05 were considered significant. Among monitoring parameters, there were significant differences in diastolic arterial pressure (DAP), End tidal CO<sub>2</sub>, PH and PCO<sub>2</sub> among four anesthetic groups.

The choice of general anaesthesia during pneumoperitoneum in absence of surgical stimuli did affect hemodynamic parameters. It conclusion laparoscopic surgery needs mechanical ventilation to prevent respiratory acidosis.

Key words: Pneumoperitoneum, mechanical ventilation, Propofol, dog





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## Liver Ultrasonographic Findings Associated With Feline Infectious Peritonitis In Cats

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The feline infectious peritonitis virus (FIPV) is a mutated form of the feline enteric coronavirus (FeCV) that can present a variety of clinical signs. The purpose of this retrospective study was to analyze hepatic ultrasonographic parenchymal changes associated with FIPV infection in cats.

A total of 32 cats were included in the study based on clinical-pathological findings highly suggestive of FIPV infection. The abdominal static and sine loop images were reviewed, and the liver parenchyma was evaluated for the comparative echogenicity, echotexture, contour, and vasculature appearance.

The liver was judged to be normal in echogenicity in 21 (65%) cats, diffusely hypoechoic in 8 cats (25%), and focally hyperechoic in 3 cats (0.01). The liver borders of all the cases were sharp.

Although ultrasonographic findings are nonspecific for FIPV infection,



the results of this study may help differentiate FIPV from hepatic-associated abdominal effusion.

Key words: Feline-FIPV-liver-ultrasound

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## Vascular Ring Anomaly In A 2 Months German Shepherd Dog: A Case Report

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Vascular ring anomalies are congenital malformations of the major blood vessels of the body that result in esophageal entrapment. Typically, a vascular ring anomaly is diagnosed through consideration of patient history, clinical signs and radiographic appearances. Under normal conditions, the aorta is derived from the left fourth aortic arch while the right fourth aortic arch typically regresses. Anomalous development of the aortic arches can lead to secondary extrinsic esophageal compression. Esophageal compression secondary to a vascular malformation is termed vascular ring anomaly. Seven types of vascu-



lar ring anomalies are described, types I through III have a persistent right aortic arch, type IV has a double aortic arch, and types V through VII have a left aortic arch with combinations of persistent right ligamentum arteriosum and right subclavian arteries, all of which cause entrapment of the esophagus. Radiographic findings in this case which were performed with contrast study were left ward deviation of trachea and the base of the heart in ventrodorsal projection and dilation as well as ventral deviation of trachea in Lateral projection. This disorder is typically diagnosed in young animals of 2-6 months of age around the time they are weaned from milk to solid food. Signs observed include failure to grow, thin body condition, voracious appetite, regurgitation, and sometimes even bulging of the neck in the region of the dilated esophagus. Since these animals are at high risk for aspiration pneumonia, other symptoms that may be observed include fever, lethargy, nasal discharge, cough and difficulty breathing. Surgical approach of present case with persistent right fourth aortic arch was left forth intercostal thoracotomy. After identifying ligamentum arteriosum, ligation was performed with silk suture. Fibrosis band around esophagus was dissected and patency of tract was check with endoscopy. Finally the normal tract between esophagus and stomach was confirmed via endoscopy. This should be performed as soon as possible after diagnosis in order to reduce the degree of damage to the esophageal muscles and nerves. Prognosis for survival to discharge is 92 percent.

**Key words:** Vascular ring anomaly, Radiography, Dog, German shepherd

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## Report Of A Fistula Between The Aorta And Pulmonary Artery In A 2-Month-Old Black German Dog

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Venous arterial fistula (AV) is rarely reported in veterinary medicine. Most AV fistulas involve the peripheral arteries of the limbs and are usually caused by trauma. AV fistulas in the central arteries are less common and usually affect the large arteries and cavities of the heart. AV fistulas have ordinarily been reported as congenital malformations in dogs and humans. The clinical signs of pulmonary aortic fistulas are similar to other left-to-right shunt defects, such as open arterial duct or pulmonary aortic window. If the shunt is large enough, the resulting excessive pulmonary circulation can eventually lead to congestive heart failure on the left side. Smaller fistulas cause varying degrees of pulmonary artery regeneration, followed by pulmonary hypertension. A 2-month-old Black German dog with no history of trauma with symptoms of severe shortness of breath, weakness, and lethargy was referred to the private sector. Severe continuous (machinery) murmurs and pulmonary crackles were heard during clinical examinations. In the thoracic graph, the trachea is elevated dorsally at the location of the heart base and mildly right side in VD view. The cardiac silhouette is severely enlarged, and a reverse D-shape is seen at the VD location. Overall opacity of lung parenchyma is severely increased with a patchy appearance. The bronchial tree is clearly visible, and enlargement of



the pulmonary artery and vein of the posterior lobes of the lung is evident. On echocardiography, the image of four right longitudinal cavities showed a large duct about 3 mm in diameter between the aorta and pulmonary artery, as well as enlargement of the right ventricle and atrium. Altogether, more severe cardiomegaly was diagnosed in the right side of the heart, and pulmonary edema with the origin of the heart problem. The patient, unfortunately, died during the treatment and diagnostic actions, exacerbation of the disease, and delay in visiting the clinic. With the consent of the patient's owner, he underwent a diagnostic dissection for further evaluation. Enlargement of the heart, left ventricular hypertrophy, hemothorax, hemopericardium, and a 4 mm fistula were observed in the ascending aorta. Early diagnosis of the congenital pulmonary aortic fistula is based on clinical signs of cardiopulmonary, lack of weight gain, and its confirmation by paraclinical measures such as echocardiography and imaging. If the fistula is closed completely and blood flow through it is stopped, the prognosis is good, but delay in diagnosis and surgical failure is associated with a poor prognosis.

**Keywords:** Venous artery fistula, Pulmonary aorta, Cardiomegaly, Dog

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## Evaluation of Radiology, Ultrasonography, and CT scan of the Abdominal Area of Striped catfish (*Pangasianodon hypophthalmus*)

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Striped catfish (*Pangasianodon hypophthalmus*) is of particular importance to veterinarians, breeders, and aquarium enthusiasts because of its ornamental resemblance to sharks, its food use in Southeast Asia, its large number of eggs, and its expensiveness. Diagnostic imaging is one of the most important clinical tools used to examine ornamental fish diseases. This study aimed to record normal images of digital radiography, ultrasonography, and CT scan of the abdominal area of striped catfish (*Pangasianodon hypophthalmus*). In this project, 10 striped catfish were used to imaging the normal coelomic cavity. Fish were anesthetized with PI-222 for imaging. Radiographs were taken in both lateral and dorsoventral views. Ultrasonography was performed in frontal and transverse view and all fishes were positioned in ventral recumbency for CT scan. Slices of fish were prepared with an electric saw in the anatomy hall for better interpretation of CT scans. Transverse, sagittal and frontal CT scans were interpreted in comparison with each other and with anatomical sections. Anatomic findings gave good results of topography of organs. Radiographic findings included the location of the swim bladder and the fish skeleton, but ultrasonography and CT scans recorded better images in which soft tissues had higher contrast. Ultrasonography findings included the followings: The renal parenchyma was hyperechoic. The surface of the swim bladder was hyperechoic and reverberation artifact could be seen below it. The liver was crescent, the gallbladder with echogenic wall and its contents were oval in shape. The spleen was elliptical.

Keywords: *Pangasianodon hypophthalmus*, Radiography, Ultrasonography, CT scan, Topography



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## Partial Atrioventricular (Av) Canal In A 3-Year-Old Dog

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An atrioventricular canal defect or endocardial cushion defect refers to a congenital cardiac abnormality that results from failure of the septum primum to fuse with the endocardial cushion and abnormal development of the inflow from AV valve rings due to malformation of septal leaflets of mitral and tricuspid valve along with or without high ventricular septum defect (complete or partial AV defect respectively) during the partitioning of the heart and chamber formation between the third and the fourth week of fetal life. Reported cases in dogs of partial AV canal defects include ostium primum defects and AV-valve dysplasia with abnormal leaflets, myxoid degeneration and short thickened chordae tendinae. Patients with AV defects have severe left to right shunting across the atrial septal defect which is enhanced by the mitral regurgitation of the dysplastic septal leaflet. A three-year-old mix breed dog with history of intervertebral disc disease was referred for cardiopulmonary evaluation before anesthesia for MRI procedures without significant cardiopulmonary clinical sign and just minor exercise intolerance after running. In clinical examination gallop heart



sound was detected in left side of the heart. For further evaluations thoracic radiography and echocardiography was performed. Radiographical findings were consistent with general enlargement of cardiac silhouette, enlargement of cranial lobar artery and veins, reverse D appearance due to right ventricular enlargement. Definitive diagnosis and assessment of the hemodynamic were made using echocardiography that were representative of a large ostium premium atrial septal defect with severe left to right shunt and concurrent malformation of the mitral valve with mitral regurgitation. Right ventricular volume overload was detected. The result of this study was compatible with previous reports which indicates that dogs with partial atrioventricular canal defect and concurrent mild mitral regurgitation may exhibit no clinical signs during the first years of life or even may be well compensated for a long time.

**Keywords:** Atrioventricular canal, defect, dysplasia, echocardiography, dog.

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## Excision Of A Fibrotic Atlantoaxial Band To Decompress The Pressure Applied To The Spinal Cord- Report Of An Infrequent Surgery

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Atlantoaxial subluxation results from a ligamentous and osseous abnormality between the atlas(C1) and the axis(C2). Atlantoaxial instability belongs to a craniocervical junction anomalies classification and probably occurs because of hypoplasia or aplasia. This instability leads to compression and contusion of the cervical spinal cord, resulting from the displacement of the vertebrae into the vertebral canal. This abnormality may happen due to trauma or congenitally in small-and toy breed dogs. It doesn't have specific clinical signs on its own, but neck pain is the most common clinical sign related to atlantoaxial luxation. This paper reports a five-year-old female Pomeranian dog presented to the Faculty of Veterinary Medicine, University of Tehran. The main reason for the reference of the mentioned dog was tetraparesis. Clinical examinations resulted in ataxia, and also negative proprioception test on all four limbs was announced. The surgical team recommended magnetic resonance imaging (MRI) to study the vertebral column and identify neurological deficiencies. The fibrotic atlantoaxial band was diagnosed based on syringomyelia evidence and displacement of C1 into the foramen magnum in diagnostic imaging evaluation. Surgery was performed by dorsal approaching to C1-C2. The dog was positioned in sternal recumbency. The midline incision of the skin was done from the external occipital protuberance up to the fourth cervical vertebrae. Osteotomy of transverse processes was done, and the fibrotic atlantoaxial band was removed. In the following step, durotomy was accomplished, and a copious amount of cerebrospinal fluid was detected. The sutures were placed with polydioxanone 2-0, from atlanto-occipital to muscles, to diminish atlantoaxial instability, which appeared due to the ligament removal. A bandage was applied after surgery and changed after two days. Seven and sixty days after surgery, postoperative follow-up showed slightly exaggerated patellar and sciatic reflexes. Forelimb reflexes seemed normal, and total clinical signs were resolved.

**Keywords:** Atlantoaxial instability, Durotomy, Magnetic resonance imaging, Dog, Fibrotic band

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## **Study Of The Effect Of Crataegus Oxyacantha Extract On Motor Physiological Parameters And Sciatic Nerve Repair Following Experimental Injury Repair In Rats**

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The main purpose of this study was to investigate the effect of *Crataegus Oxyacantha* extract on physiological motor parameters and sciatic nerve repair following experimental injury repair in rats.

In this study, of 48 adults male Wistar rats with an age range of 14-12 weeks and a weight range of 210-100 g, the use of all animals before surgery was evaluated for motor health and then all mice were injected intraperitoneally with ketamine. Hydrochloride. (60 mg / kg) and xylazine (10 mg / kg) were anesthetized and after scraping and preparing the animals' left foot, an incision was made in the posterior-outer skin of the left foot. The group and fascia were gently removed and, after exposure to the sciatic nerve, the sciatic nerve was pressed for 60 seconds using a fine hemostat (held on a first-degree forceps to press on the nerve to lock the tooth. Is). Then it was put together and the subcutaneous tissue and skin were sutured using vicryl thread (0-4) and nylon (0-3), respectively, in a simple all-round and simple method. The animals were divided into 4 groups: group 1: untreated nerve damage, groups 2, 3 and 4 were treated with *Crataegus Oxyacantha* extract.



Group 2 (100 mg / kg) and group 3 (200 mg / kg) and group 4 (at a dose of 400 mg / kg) are treated with ordinary extract. There were 12 mice in each group, which were evaluated at two-time intervals of 2 and 4 weeks. The motor test of sciatic nerve function index was performed in the canal. This canal was made of fiberglass and was 50% high and 7% long and 60 cm long. This test was performed on the 14th and 28th days after surgery and the footprints were analyzed. To perform the test, the bottom of the canal was covered with absorbent paper and the animal was gently tied and the soles of its feet were pressed against the stamp or blue ink. The animal was then placed in a canal. After crossing the canal, the papers were grouped separately and evaluated.

**Results** The results show that the repair of sciatic nerve damage in the group treated with 400 mg / kg dose with *Crataegus oxyacantha* extract has better results in pathological examination.

**Keywords:** Sorkhe Valik extract, sciatic nerve repair, rat

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## Studying Of Lesions Of Proximal Sesamoid Bones In Horses In Riding Clubs

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Lameness is one of the most common causes of poor performance in sport horses. Diseases or injuries of the musculoskeletal system are major causes of poor performance of sport horses. The fetlock joint in horses is prone to various injuries and lameness, and sesamoid bone inflammation is one of the abnormalities of the fetlock joint in horses. For this study, 32 horses with lameness and musculoskeletal problems were selected for the study after clinical examinations with suspected complications in fetlock. Horses were examined for appearance and any changes such as soft tissue inflammation, stiffness, pain response in flexion tests and tactile and percussion tests. Radiography was performed. First, radiographs were prepared with lateral and dorsal placement of the sole and, if necessary, oblique and flexed radiographs were taken. After a definitive diagnosis, treatment was performed. The limbs that have lameness and sesamoid bone inflammation were identified and the following results were obtained: cranial limb was 71.87% and caudal limb was 28.12%. If signs of lameness were observed, radiographs were taken of the limb. Radiographic signs were divided into 6 categories: reduction of bone density by 12.5%, formation of new bone growth at the edges of the bone by 9.37%, intraosseous cysts by 15.62%, new bone growth at the edges of the bone and intraosseous cysts by 18.75%, joint inflammation without observing bone complications and bone changes by 28.12%, joint inflammation with inflammation of the flexor tendons without signs and bone changes by 16.52%. Then the necessary treatments were performed: in all cases, 10 days of rest in addition, the administration of ketofen for 5 days; Administration of phenylbutazone for 5 days; Intra-articular administration of methylprednisolone 80 mg once; Intra-articular administration of triamcinolone 15 mg once. Treatment results: 50% were completely cured and 31.25% partially responded to treatment but 18.75% of horses did not respond to any treatment. The incidence of this complication is higher in the forelimbs, especially in adult horses, but in foals, it occurs more in the hindlimbs. Examination of radiographs showed that



arthritis without bone lesions and bone changes had the highest rate of sesamoid bone lesions in horses and the highest response to treatment is in the same group.

Key words: Horses – axial sesamoid bone - Fetlock joint lameness

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## Osteosarcoma Arising From Tibial Ossifying Fibroma In A Cane Corso Dog- The First Case Report In Iran

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In February 1400, a five-year-old female Cane Corso dog was examined at Pardis Veterinary Clinic with ten months history of mild arthrosis in the right stifle joint and occasional inability to bear weight on the right hind limb. Radiographically, a smooth but ill-defined proliferative periosteal reaction was observed in the right proximal tibia and, to a lesser extent, in the distal femur, suggesting an aggressive bone lesion such as osteomyelitis or less likely neoplastic condition. Meloxicam was prescribed in addition to chondroitin sulfate and glucosamine sup-



plements and antibiotics. Subsequently, prednisolone was prescribed (75 mg BID), symptoms were relieved, and full weight-bearing started. After one month, lesions exacerbated; thus, a biopsy was scheduled, and prednisolone was gradually tapered, resulting in a relapse of limping and weight-bearing difficulties. The proximal tibial mass was biopsied, and four irregular, cream-brown tissues of firm to hard consistency were obtained, measuring approximately 1\*0.6\*0.4 cm, and submitted for histopathology. The specimens were fibro-osseous tissues, lacking features of malignancy. Ossification of the neoplastic mesenchymal cells, formation of irregular woven bone trabecula lined by osteoblasts, and several mature osteoclasts led to the diagnosis of ossifying fibroma. Masson's Trichrome staining also confirmed the diagnosis. The patient was followed and returned after two months with a rapidly growing tumor at the same site. Radiographically, proliferative bony changes were associated with irregular spicular and Codman triangle periosteal reaction, with hazy transitional zone, cortical and medullary involvement of proximal tibia, and lytic and remodeling changes of the proximal tibial and distal femur, indicating a more aggressive nature, either malignancy or osteomyelitis. Fortunately, no signs of metastatic lesions were present radiographically. Amputation was undertaken by disarticulating the hip joint, and the tibial mass was histopathologically evaluated. Round to oval and pleomorphic osteoblasts were observed possessing mitotic activity (MC=20/10HPF), with several amorphous osteoid foci, some newly formed spicules, multinucleated giant cells, hemorrhage, and massive necrosis, leading to the diagnosis of moderately productive osteoblastic osteosarcoma. Ossifying fibroma is more commonly seen in horses, and mandible is more commonly affected. It is a rare entity in dogs. To the authors' knowledge, malignant transformation of ossifying fibroma has not been reported in veterinary medicine; however, limited cases have recently been reported in humans.

**Keywords:** Tibia, Neoplasia, Osteosarcoma, Dog, Radiology, Surgical Pathology

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## **Surgical Treatment Of Osteosarcoma In A Great Dean Dog**

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A two-year-old male great dean dog with a history of lameness was brought to the veterinary hospital by his owner. Weight bearing lameness with swelling on the medial side of the right radius and proximal region of the left tibia was detected during physical examination. For the differential diagnosis surgeon recommended bone sampling and radiograph from those sites.FNA was performed in both regions, but the result was inconclusive. A complete blood count (CBC) was taken and only showed leucocytosis by neutrophilia. Radiographs show severe geographic and moth-eaten osteolysis foci in the right radius's distal epiphysis, meta, and distal diaphysis. Same signs in tibial tuberosity and proximal epiphysis of left tibia with cortical destruction were seen. For initial treatment of possible osteomyelitis, ceftriaxone (20mg/kg – q12hr) with clindamycin (10mg/kg – q24hr) was prescribed for ten days. No significant change was visible at both sides and Osteosarcoma was the final diagnosis. Amputation of the right radius and left tibia was recommended by surgeon. Premedication anesthesia was started with ketamine (4 mg/kg) and diazepam (0.2 mg/kg). induction of anesthesia



was with midazolam (0.2mg/kg) and propofol (2.5 cc). Isoflurane was used for maintenance. Due to the severity of the bone lesions, complete amputation of the right radius from the scapula and left tibia from the head of the femur was done without any complications. Postoperative drugs were ceftriaxone (20mg/kg – q12hr) with clindamycin (10mg/kg – q24hr) for five days. The histopathology of amputated regions confirmed the presence of osteosarcoma. The patient was evaluated monthly with chest radiography and abdominal ultrasonography. The evaluation of possible outbreaks of micro metastases was not observed monthly, which are reported as common in patients with osteosarcoma. Osteosarcoma (OSA) or osteogenic sarcoma is the most common primary bone cancer diagnosed in dogs, a malignant mesenchymal tumor from the primitive anaplastic bone cell, characterized by an extracellular matrix osteoid production, which is used for their histological differentiation. The combination of surgery with chemotherapy has been the treatment protocol that provides improved survival. The drug indicated for chemotherapy is carboplatin. Regardless of the therapeutic protocol chosen, the lifetime is estimated at six months to one year. This study aims to report surgical treatment of osteosarcoma in a large-sized male dog, who showed no metastasis lesions.

**Key words:** osteosarcoma – micro metastases – Dog – Amputation

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## **Report Of Surgical Treatment Of A 4-Day-Old Deer With Fracture Of Tibial Bone In Left Hindlimb**

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Wild bovids, especially those kept in enclosed areas, are prone to trauma, which often leads to disability, infection, and eventual death. In domestic ruminants, most fractures reported due to trauma are in the metacarpal/metatarsal areas. In the wildlife, reports of orthopedic condition management in wild cows are very rare. In previous reports, external skeletal fixators have been used to treat metacarpal/metatarsal fractures. A 4-day-old female deer with a history of trauma and an open fracture in the left tibia was referred to Lorestan University Veterinary Hospital. After the clinical examination, the physiological signs were normal and the deer was referred to the radiology department of the hospital for radiography. After radiography, a transverse fracture in the distal diaphysis of the tibia was confirmed. Subsequently, with the consent of the owner, surgical procedures were performed to repair the fracture. Initially, the surgical site was prepared aseptically. Afterwards, to induce anesthesia, due to the low age of the deer, a combination of ketamine and midazolam with doses of 4 mg/kg and 0.4 mg/kg were used, respectively. For maintenance, 1% isoflurane was used by inhalation using a mask. Following anesthesia of the animal, the fracture fragments were reduced and in order to fix the fracture, a 1.5 size intramedullary (IM) pin was inserted in the medulla in a normograde fashion from the medial of the tibial tuberosity. Due to the fact that the deer was referred to the hospital immediately after the fracture and the golden time for suturing the wound had not passed, the surgical site



was sutured. Polyglycolic acid suture material size 3-0 was used for stitching muscle and subcutaneous tissue, and polyamide suture material size 0-3 was used for skin sutures. Eventually, external coaptation was employed using orthopedic fiberglass cast. The owner was advised to refer the deer to the clinic two weeks later to change the cast again. The antibiotics Penstrept 1+1 and flunixin meglumine were administered postoperatively for five and three days, respectively. Follow-up of the case after four weeks showed that the deer had recovered.

**Keywords:** Tibial fracture, deer, pinning, surgical treatment, Gazelle

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## Management Of Distal Tibial Fracture In A Jungle Cat (*Felis Chaus*) Using Orthogonal Double Plating

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The jungle cat (*Felis chaus*) is one of the rare species of cats in the wildlife of Iran, which is distributed in the north of the country and in the Alborz Mountains. A 2 years old male jungle cat was referred to the Small Animal Hospital of faculty of veterinary medicine, university of Tehran from The Eram Zoological Garden with a history of lameness



in the right hind limb from 3 days ago. In primary observation the animal had non weight bearing lameness in right hindlimb. After intramuscular injection of ketamine and medetomidine, further examination was performed and crepitation and instability in distal diaphyseal region of right tibial bone was confirmed. After clinical examinations, blood sample collected for complete blood count and biochemistry evaluation and then the animal referred to department of radiology for radiography and computed tomography from affected bone. Radiographs confirmed a comminuted fracture in the distal diaphyseal region of tibia and an oblique fracture in distal diaphyseal region of fibula. Also soft tissue swelling in distal tibial and tarsal region was evident. According to normal blood results and clinical and radiographic findings, open reduction of fracture was chosen as the treatment of choice. Endotracheal intubation was performed and surgical site prepared aseptically. Double plating of tibia with two 2.7 mm hole plates, one on medial side with 8 bicortical screws and another on cranial side of tibial bone with 6 bicortical screws used as method of fixation. Long acting Amoxicillin used prophylactically and continued for 5 days after surgery. Tramadol and gabapentin used for pain control. Plate removal after 4 months recommended to Zoo veterinary care team. The animal evaluated after 14, 30 and 60 days after surgery and no abnormal signs of surgical complications was observed. One of the most challenging aspects of wild life orthopedic surgery is post-operative care and thus double orthogonal plating of these fractures preferred than single plate methods.

**Key words:** jungle cat, wild life, *Felis chaus*, fracture, tibia

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## Investigation Of The Effect Of Estrogen (17-B Estradiol) On Reconstruction Of Anterior Cruciate Ligament Rupture In Rabbits By Mesenchymal Stem Cells

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Anterior cruciate ligament injury is one of the most frequent sports injuries in humans and one of the most important causes of lameness in dogs. Anterior cruciate ligament injury results in pain, swelling and knee instability and without timely therapeutic intervention, subsequently causes osteoarthritis. According to the limitations of anterior cruciate ligament reconstruction, application of biological treatment such as mesenchymal stem cells is increasing. There are various types of stem cells such as embryonic, induced pluripotent and mesenchymal stem cell. Among these, mesenchymal stem cells are most widely investigated. Estrogen has variety of roles in integrity of anterior cruciate ligament. The purpose of this study was to evaluation of the estradiol effect on mesenchymal stem cells in healing of experimentally induced cranial cruciate ligament injury.

Twenty-four mature male rabbits were neutered, then the anterior cruciate ligaments were transected partially. After 1 week the rabbits were randomly divided into 4: the control group, stem cell group, 17- $\beta$  estradiol group and stem cell and 17- $\beta$  estradiol group. The rabbits received 500  $\mu$ l intracapsular injection of one to the following: (1) PBS only, (2)  $10^6$  MSCs in PBS, (3)  $10^{-4}$  molar 17- $\beta$  estradiol in PBS or (4)  $10^{-4}$  molar 17- $\beta$  estradiol and  $10^6$  MSCs in PBS. Histological evaluation of cellularity, cell morphology, collagen arrangement, vascularity and ground substance of the ligaments has been done at 7 weeks after transection. The anterior cruciate ligaments were evaluated using modified Bonar's scale. The best result has been observed in the mesenchymal stem cells group compared with other groups. Because of interaction with collagen synthesis 17- $\beta$  estradiol is not recommended.

Key words: anterior cruciate ligament, stem cell, 17- $\beta$  estradiol



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## Evaluation Of The Effect Of Differentiated Macrophage Affected By Dexamethasone On Full Thickness Experimental Wound Healing In Streptozotocin-Induced Diabetic Rats

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**Objective:** Skin is the largest organ of the body and a major barrier against the entry of microorganisms into the body. The wound is also called any incision and loss of connectivity of the tissues inside and outside of the body. Researchers around the world are always trying to find a way to accelerate the healing of different types of wounds. In chronic wounds, such as diabetic ulcers, the healing process usually is not complete and various factors are impaired. Chronic ulcers are wounds that are often affected by ischemia, diabetes mellitus, venous arthritis or hypertension. A significant difference was recorded between healthy and diabetic rats in terms of healing time and strength of wound tissue. It has been shown that differentiation of macrophage categories, it has an effect on the healing of diabetic ulcers. The use of dexamethasone-affected monocyte/macrophage has been suggested in the process of neural repair and ischemia, causing suppression of



host immune system and increasing the healing process in this pathway. In diabetic wounds, in the early stages of activation of classical macrophages was incompetent. Considering the key and effective role of inflammatory-defensive cells in wound healing and its distribution, Considering the key and effective role of inflammatory-defense cells in wound healing and its extension, the aim of this study was to investigate the effect of differentiated dexamethasone macrophages on full thickness experimental wound healing in diabetic rats with Streptozocin.

**Materials and Methods:** In this study, 24 adult male white rats of Wistar with an average weight of 250-300 grams were selected. To induce diabetes in rats, single dose injection of Streptozocin was solved in citrate buffer (pH=4.5) and Intraperitoneal method was injected with a dose of 70 mg/kg. And they were randomly distributed in two groups of control (C) and treatment (T), a full-thickness skin defect with dimensions of 2×2 cm on the skin of the back, between the neck and the pelvic area. At the same time, blood glucose levels of all mice were examined through tail vein blood and were higher than normal. Also, blood samples were taken from the hearts of the mices and leukocytes were separated at the laboratory. Then, the cells were separated and cultured by dexamethasone and differentiated to M2 level, then on day 10, differentiated macrophage cells soluble in serum was injected into the treatment group and the control group received serum without cell. The injectable cells are the result of the monocytes of the laboratory animals which were autograft-transferred cells. Histopathological specimens were prepared from mice on days 10, 17 and 24, then facilitation was performed and microscopic examination was performed. Macroscopic examination was performed by using Image j software.

**Results and Discussion:** By evaluating the wound healing percentage parameter, after time in the treatment group, we saw an increase in fleshy tissue formation, increased wound contraction, reduced inflammation and microscopic results in the treatment group, control of fibroplasia, high resolution angiogenesis, severe angiogenesis, The presence of fibroblasts at the wound site, as well as new blood vessels maturing and an increase in collagen at the wound area. Thus, it seems intralesional administration of differentiated macrophage affected by



dexamethasone could improve diabetic wound healing.

**Keywords:** Streptozocin, Wound healing, Dexamethasone, Diabetes, Macrophage, Rat

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## **The Effect Of Topical Application Of Pentoxifylline And Zinc Oxide Combination On The Experimental Full-Thickness Wound Healing In Rats**

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One of the most important challenges for researchers is to find a substance that can have a beneficial effect on the healing of various types of skin wounds. Considering the potential properties of pentoxifylline and the positive effect of zinc oxide on the improvement of skin wound



healing, this study was designed to investigate the effect of topical application of pentoxifylline and zinc oxide on the healing of full-thickness experimental skin wounds in rats. In this study, 48 adults male Wistar rats weighing an average of 250 to 300 g were randomly selected and divided into four groups of twelve: control (C), pentoxifylline (P), zinc (Z), zinc-pentoxifylline (ZP). 5% pentoxifylline ointment was formulated according to the article of Najafi et al. While observing ethical points, after anesthesia by intraperitoneal injection a combination of ketamine 10% and xylazine 2%, under aseptic conditions, using a sterile ruler and a razor blade, we created a 2 × 2 cm thick skin defect in the skin of the back of the animals. In order to manage the wound, the wound created in the control group was washed using normal saline and sterile swabs. In other groups, the wound was treated with a thin layer of pentoxifylline, zinc ointment and a one-to-one combination of zinc and pentoxifylline, respectively. Each main group was divided into three subgroups of four. On days 7, 14 and 21, one subgroup of each main group was euthanized and sampled, then the samples were examined macroscopically and microscopically. At the end of this period, the highest percentage of healing and wound closure, the highest rate of keratinocyte migration and the lowest area of wound and the lowest rate of inflammation belonged to the zinc-pentoxifylline group. Although during 21 days, the decrease in the number of fibroblasts in the Z and ZP groups was more than the other groups, but the rate of inflammation and the number of inflammatory cells at the end of the period was lower in the ZP group than in Z and there was a statistically significant difference ( $p \leq 0.05$ ). At the end of the first week, the largest diameter of vessels belonged to group P, which was statistically significant with group C ( $p \leq 0.05$ ). On day 14, the vascular diameters of all groups were approximately in the same range, and on day 21, the vascular diameters of the control group were larger than those of the other groups. Overall, this study showed that wound healing following topical application of a combination of zinc oxide and pentoxifylline is not only problematic but also performed with better speed and quality. However, more studies are needed to confirm this conclusion.

**Keywords:** Topical Pentoxifylline, Wound healing, Zinc oxide, Rat

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## **Clinicopathological And Epidemiological Study Of Canine Mammary Gland Tumors In Tehran**

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Recent advances in veterinary medicine and the improvement of animal health have increased their longevity. Similar to humans, the incidence of neoplasms in companion animals has been rising for many years, especially in dogs. Canine mammary gland tumors (CMTs) are the most common group of neoplasms, second to skin tumors, while their incidence is highest in intact female dogs. A multifactorial etiology has been proposed for CMTs, including genetic, hormonal, and immunological factors. Various studies have estimated the prevalence of malignant CMTs to be 20-80%. This report partially presents the results of a two-year study (2020-2022) conducted in four clinics in Tehran on canine breast tumors. Of the 76 female dogs with mammary masses, 141 glands were surgically removed and evaluated for pathological lesions. 56% of patients were intact, and 42% were spayed after the third heat cycle. The age group of 10-11 years had the highest incidence of mammary gland tumor development (20%). The majority were Terriers (31.5%). The highest involvement incidence was noted in



the inguinal pair (31%), followed by the caudal abdominal pair (28%). The left chain was more affected. 80% of the referral samples were malignant, and intraductal papillary carcinoma was the most common encountered lesion (17%), followed by complex carcinoma (16%) and carcinoma-mixed type (14%). Approximately 90% of malignancies were Grade I, and lymph node invasion was mainly observed in Grade III malignancies. Clinicopathological and epidemiological studies provide data on the prevalence of neoplasms in different geographies and periods. This data, together with knowledge of breed popularity, dietary habits, and exposure to carcinogens in each region/time, can be used to prevent malignancies. Today, the role of estrogen and progesterone is well-documented in predisposing females to mammary tumors. In the present report, in harmony with the results of previous studies, all the referred dogs were female. However, few mammary tumors have been reported in male dogs, where most of these masses have been diagnosed as benign lesions. In the present study, caudally located glands were more prone to tumor development than the cranial ones, consistent with previous findings. Although the incidence of tumors in the left mammary chain was higher in this study, previous researches have not indicated the predisposition of either chain.

**Key words:** Dog, Mammary gland, Neoplasia, Surgery, Surgical pathology, Epidemiology

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## **Surgical Repair Of Rectovaginal Laceration In 12 Mares And Results**

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Most perineal injuries in mares occur after dystocia and these types of injury are one the most common causes of infertility of mares. These types of injuries categorized based on severity to 3 degrees. In this paper results of 12 cases of surgical repair of rectovaginal injuries that was referred to large animal hospital of faculty of veterinary medicine of university of Tehran between 2020 and 2021 have been reported. The mares age ranged from 4 to 12 years old. 3 of 12 patients had been diagnosed with rectovaginal fistula and other 9 patients diagnosed with third degree laceration after initial clinical examination. One of rectovaginal fistulas repaired directly without turning into third degree laceration (as it is common) due to caudal position of fistula and good accessibility. Two other cases of rectovaginal fistula turned into third degree laceration and repaired as other 9 third degree lacerations. For best results from this surgical repair, stool softeners used for 2 weeks before surgery and all 12 cases fasted for 24 hours before surgery. patients restrained in standard stock with good accessibility to perineal region. Intravenous administration of detomidin was used for chemical restraint and standing surgery. the perineal region and external part of reproductive tract anesthetized with caudal epidural administration of lidocaine and xylazine. Surgical site prepared aseptically. Fibrotic tissue excised and rectovaginal lacerations repaired with modified six bite method. Stool softeners continued for 2 weeks after surgery to prevent pressure on surgical site. Penicillin and streptomycin Prescribed



for 5 days as antimicrobial treatment and flunixin meglumine used for 3 days for pain control. The mares prevented from laying on the ground for 2 weeks after surgery. in none of 12 cases post-surgical complications like fistula formation, suture dehiscence and stenosis was not observed. Artificial insemination of these mares for first conception is preferred over mating with stallion.

**Keywords:** mare, reproductive tract, rectovaginal laceration

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## Application Of Tubular Skin Flaps In Equine Skin Wound

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Wound Healing has been considered as one of the basic challenges in equine practice.

To heal such wounds, free skin grafts or skin flaps can be used. The purpose of this survey is to study blood circulation in single pedicle tubular skin flaps. In six donkeys, shoulder and arm prepared for aseptic surgery. Anaesthesia induced with intravenous ketamin and diazepam. A tubular skin flap prepared in such a way that its pedicle heads up, then the flap rotated approximately 80 degrees into a skin defect and sutured. Penicillin – streptomycin administered as postoperative antibiotic for 7 days. The Flaps monitored daily for healing progress, circulation and checking the possibility of necrosis for three weeks. Three



of six donkeys showed the symptoms of necrosis which expanded up to 20% of flap length. In other two donkeys bruising, decrease in temperature and necrosis observed after 12 days. In one of donkeys, flap detached due to high tension after 3 days. A study by Winsper on distant flaps showed that accurate planning of tubular flaps can be served as reliable method for reconstruction of distal extremity. Gregory and Gourleys showed that in low circulated and high-tension areas, application of tubular flaps is superior to other reconstructive methods. In accordance with previous studies, the flap length must be up to three times longer than its width in order to provide appropriate flap circulation. In this study single pedicle tubular skin flaps, however, cannot provide proper circulation even if it was shorter, because there are incisions on three sides in order to create tubular flaps. So, we should use bipedicle tubular flaps to have proper bilateral circulation.

Key words: Equine, tubular skin flaps, wound healing.

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## **Excision Of 6 Kg Ovary Tumor (Gct) By Diagonal Paramedian Approach In A Kurdish Mare**

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Ovarian tumor has been reported 2.5% of all equine neoplasms and granulosa cell tumor (GCT) is the most common ovarian tumor in horses. The GCT account for 85% of all equine reproductive tract. A 13-year-old Kurdish mare due to ovariectomy was referred to the teaching large animal hospital, faculty of veterinary medicine, University of Tehran. According to the history, the mare had a small cystic ovary one year ago which had been enlarged by the time. On rectal palpation, the left ovary tumor was as large as a football ball. Since the huge size of tumor and inappropriate surgery condition in the farm, the vet referred to surgery. The mare was sedated by xylazine (1 mg/kg), inducted using a mixture of ketamine (2 mg/kg) and diazepam (1 mg/kg). Anesthesia was maintained with Isoflurane and oxygen. After surgical preparation of the abdomen, a diagonal paramedian incision was made. The big ovary was exteriorized by transecting of external rectus sheath, rectus abdominus, internal rectus sheath and peritoneum. It was some difficulty to pull out the affected ovary from abdomen. Approximately 1 liter inside tumor cavity was suctioned to increase maneuver for inserting ligatures on ovary pedicle and then mesovarium hemostasis was made by transfixation ligatures with no.2 polyglycolic acid suture material. Afterward the left heavy ovary weighing 5 kg with 24 cm in diameter was excised and the abdominal incision was closed in routine fashion. The tumor samples were fixed in 10% formalin solution and sent to pathology department. Pathology report confirmed the GCT as an involved ovary tumor in this case. was confirmed by pathology lab. Ovariectomy in horses is considered as an elective surgery and for this surgical procedure, various approaches described include colpotomy, flank, midline, paramedian, diagonal paramedian and laparoscopy. As compared with other approaches, the diagonal paramedian is superior especially for ovary removal up to 25 cm. Exteriorization in this approach results in less tension on the mesovarium which is so



helpful for ligature placement. In this case, removal of the massive ovary was obtained through diagonal approach with no complication and less difficulty. After three months, the mare is in good condition.

**Keywords:** Ovary Tumor, GCT, Diagonal Paramedian, Horse

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## **A retrospective study of the frequency, causes and complications of cesarean section in ruminants in south west Fars**

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Dystocia is a common problem in veterinary clinics. There are various causes for it and often

leads to cesarean section. This study purposed for evaluation of frequency, causes and complications of cesarean section with emphasis on identifying the type of livestock population undergoing surgery. A total of 224 patients underwent cesarean section in Kazeroun veterinary



teaching hospital during 1996-2021, which included 72 ewes (32%), 64 goats (28%), 88 cows

(39%). About 81% of cesarean sections in small ruminants and 92% in cattle result in live births.

75% of the causes of dystocia were related to maternal and 25% were related to fetal factors.

Surgical approach in cattle was left ventrolateral oblique in five cases and low flank in the

remaining cases. Also, in all cases of cesarean section performed on small ruminants, the

approach was low flank. All patients positioned in right lateral recumbency except in two bovines

cases that performed in standing position.

**Keywords:** Cesarean section, Ruminant, Complications

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## Case Series Of 80 Cesarean Section Surgery Of The Ewe, Challenges, And Complications

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Cesarean section surgery should be considered for management of dystocia in situations that lead to impossible vaginal delivery. The most common indications in sheep cesarean section surgery are ringwomb (failure of cervical dilation), fetal malposition, and vaginal prolapse. Occasionally the mentioned technique can be used to terminate pregnancy in ewes that suffering from pregnancy toxemia or ketosis. Emergency situations requiring cesarean section include uterine torsion, ruptured prepubic tendon, ruptured uterus and rectal prolapse. Cesarean section to correct dystocia has been routinely performed with excellent success rates in general veterinary practice. In this study, cesarean section of 80 ewes, the causes and related challenges have been discussed. 57 cases have been diagnosed with dystocia caused by ringwomb, 8 cases by vaginal prolapse and 15 cases by pregnancy toxemia under two years old ewes. All cases were positioned in right lateral recumbency, the left flank area was clipped, and analgesia was performed with lidocaine 2% with a linear fashion (incision site). The selected surgical approaches were the left flank in 62 cases and the lower flank in 18 cases (due to uterine expansion caused by fetal oversize or multiple fetuses) respectively. Surgery performed with two incisions on uterine horns (one on each uterine horn) as a result of fetal oversize in 19 cases. 3 cases have failed after surgery; marked uterine necrosis in one case and delay surgery, anorexia, and inappropriate former medication in two other cases. There was no complication in the subsequent pregnancy of 77 ewes that have a history of surgery. The success rate of Cesarean section surgery for fetal viability is 97 to 100 percent yet, the success rate in this study was 55 percent. The most important factors are timing and discission making for cesarean section surgery and referring to the veterinarian.

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**Key words:** Cesarean section, Surgery, Ewe, Iran



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## **Evaluation The Effectiveness And Comparison Of Combinative Treatment Of Cold Plasma Jet And Low-Level Laser On Wound Healing In Rats**

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The aim of this study was to evaluate and compare the macroscopic effect of low level laser and plasma jet for wound healing in rats. The study was performed on 40 old male white rats with an average weight of 250 g and an average age of the same age. After preparing the rats from Ibn Sina Research Institute, they were kept the same for three under environmental conditions such as temperature, humidity and light, and nutrition such as the type of diet and the number of meals. Then, to start the research, rats were randomly divided into four groups. Group A: medical treatment, Group B: cold plasma treatment, Group C: low level laser treatment, Group D: plasma and laser treatment. All rats were off feed for 4 hours before each anesthesia. Rats were anesthetized by intraperitoneal injection of ketamine 10% and xylazine 2%. After scrubbing between two shoulders of each rat, a circular wound was created by sterile 5 mm biopsy puncture. Group A were treated by silver sulfadiazine 1%, Group B were treated in three sessions with argon plasma jet 20kHz, Group C were treated in three



sessions by low level laser 670nm , Group D were treated by low level laser and argon plasma jet. The process of wound healing and contraction is evaluated by measuring and comparing the wound area on different days of the treatment period. Based on the observed results, taking into the rate of wound healing and duration of treatment it seems that Low level laser radiation has more acceptable and appropriate effects on wound healings.

**Key words:** Rat, Wound healing, Plasma jet, Low level laser

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## Comparison Of The Effect Of Two Methods Of Antibiotic Therapy On The Incidence Of Postoperative Infection After Hysterectomy In Dogs

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This study was carried aimed to investigate the effect of antibiotic dose



on the incidence of postoperative infection after hysterectomy on 100 native dog breeds (two groups of 50) referred to a private hospital in Rasht for one year (September 2020 - September 2021).

For the first group, a dose of cefazolin was administered intramuscularly immediately after surgery. For the second group, a dose of cefazolin was administered intramuscularly (IM) immediately after surgery and then a dose of ampicillin was administered intramuscularly (IM) every 12 hours for 4 days (a total of 8 doses).

In the first group, of the 50 cases studied in the first group, 8 became systemically infected, in total, 16% were infected.

In the second group, 2 cases of infection (mild to moderate) were seen. Of the 50 cases studied, a total of 4% were infected. No cases of severe infection were observed in this group.

According to the results and a 12% reduction in the incidence of infection, it seems that the treatment of the second group is more effective in combating infections after ovario-hysterectomy. Another study in China in 2017 found that animals that received cefazolin injections preoperatively were 0.36 times more likely to develop postoperative infections than animals that received penicillin with dihydrostreptomycin. Another study in the UK in 2020 stated that the use of injectable antibiotics after surgery is a mistake if the aseptic conditions are fully met, which not only tolerates the pain of the injection but can also lead to bacterial resistance and infection.

According to the above studies, it seems that the administration or non-administration of antibiotics is determined according to the surgical conditions.

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to moderate presurgical leukocytosis." *Journal of the American Veterinary Medical Association* .773-765 :(2022) 260.7

## **Clinical Reports Of Laser, Plasma And Light Therapy Applications In Surgical Patients**

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The aim of this study was to evaluate the clinical effect of modern medicine in surgical patients. In general, the effect of modern therapies was studied and evaluated in 31 patients like dogs, cats, birds, turtle and squirrel. In this study, based on clinical findings for these 31 patients, independent and combined therapies including laser, plasma and light therapy were used , The details include treatment of 21 patients in the laser section (reconstructive- surgery),7patients in the plasma section (reconstructive-surgery) and 3 patients in the light therapy section(reconstructive).These cases briefly include soft tissue laser surgery, rapid healing of wounds (acute- chronic), skin lesion resection, non-invasive resection of eyelid masses, non-invasive blepharoplasty, pain relief and inflammation of joint disease along other similar cases can be done easily by modern medicine without the slightest invasion. After examination, diagnosis of the lesion and injury, laser , plasma and light therapy process in 2 surgical and reconstructive parts were selected, started without general anesthesia in most cases (above 93%) and performed with local anesthesia. Finally, after reviewing the results, it can be said that modern medicine in veterinary medicine (laser, plasma and light therapy) has many advantages compared to other classical methods of surgical medicine, including the high accuracy of laser and plasma devices because of less bleeding during the operation, which increases the accuracy of the surgeon and improves the healing process in the local area. In the field of repair, modern medicine (low -level laser and light therapy) is able to make positive changes at the cellular level,



which is created without creating significant heat on the cell surface. These photochemical responses lead to physiological changes in cell function and thus improve the speed of repair, the quality of the surgical procedure, recovery and improvement of the Homeostasis process after surgery.

**Keywords:** Modern medicine, surgery, laser, plasma, lighttherapy, veterinary medicine

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## Removal Of An Aspirated Bone From Trachea By Tracheotomy In A Dog

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A 2-year-old male Shih Tzu terrier mix dog (9.2 kg) with a history of a moderate dyspnea for 6 days was referred to the Veterinary Teaching Hospital of Shiraz University. The owner reported that respiratory distress is intensified in the mornings. In radiographic images, a radiopaque foreign body (a bone fragment) was observed in the trachea. The case received cefazolin (22 mg/kg (IM); Daana Pharmaceutical Co., Iran) as prophylactic antibiotic therapy. The premedication included acepromazine (0.1 mg/kg; Alfasan, The Netherlands) and xylazine (0.5 mg/kg; Alfasan, The Netherlands). Anesthesia induction was performed by a mixture of ketamine (10 mg/kg; Bremer Pharma GmbH, Germany) and midazolam (2 mg/kg; Exir Pharmaceutical Co., Iran). By cephalic vein catheterization, the patient was receiving ringer solution as 10 mL/kg/h (Shahid Ghazi Pharmaceutical Co., Iran) during



surgery. The patient was constantly monitored in terms of heart rate, oxygen saturation (SpO<sub>2</sub>), and respiratory rate. Endoscopic removal was unsuccessful because of the shape of the bone fragment. Therefore, an open procedure was performed immediately to remove the foreign body from trachea. The case was intubated and anesthesia was maintained via isoflurane. In radiological images, the approximate position of the foreign object was determined so that the incision was made at the same location. The dog was placed in dorsal recumbency, and limbs were secured properly. Ventral aspect of neck was shaved and disinfected surgically via povidone-iodine. Surgical drapes were located around surgical site. The incision was made in the middle line and the muscles were separated. A transverse incision was made between the two tracheal cartilages, but unfortunately we found that the tracheal tube had pushed the foreign body forward. We used Noyes alligator forceps and removed the bone from the trachea. At the end, the trachea incision was sutured with a simple interrupted pattern, the muscles were sutured together, and finally the skin was closed routinely. Tracheobronchial foreign bodies are a rare cause of chronic cough but have been reported in humans, dogs, cats, horses, and a chimpanzee [1]. Bronchial foreign bodies are rarely diagnosed in companion animals.

**Keywords:** dog, tracheotomy, foreign body

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## Corrective Surgery of Nares Stenosis with Single Pedicle Advancement Flap Technique in Three Brachycephalic Cats

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Brachiocephalic Obstructive Airway Syndrome (BOAS) is one of the most common causes of upper respiratory tract obstruction in dogs and is less common in cats. The anatomical features of the skull in Brachycephalic breeds, cause this syndrome. Due to these features, major abnormalities such as stenotic nares, tracheal hypoplasia, soft palate elongation, everted laryngeal saccules, and laryngeal collapse. This syndrome can lead to variable degrees of obstruction and symptoms such as dyspnea, wheezing, exercise intolerance, and even in severe cases, cyanosis and collapse.

As mentioned, nostril stenosis is one of the abnormalities that may develop this syndrome. Axial deviation of the alar cartilage has been reported as the main cause of nasal stenosis in dogs. In cats, the skin fold at the junction of the ventral floor of the nostrils mostly causes narrowing of the nares, and deviation of the alar cartilage is less common in this species.

During the year 1400, three brachycephalic cats (a four-year-old Persian flat-faced, a one-and-a-half-year-old Persian and a two-year-old Chinchilla-Scottish) with symptoms of inspiratory obstruction were referred to the surgery department of Veterinary Teaching Hospital of Ferdowsi University of Mashhad. Common symptoms seen in these patients included respiratory distress, dyspnea, nasal discharge, stertor/stridor while examining head and neck, restlessness, and decreased activity. All of these three patients had chronic respiratory problems which was resistant to medication. Based on clinical examinations and evidences, the cause of this obstruction was diagnosed as nostril stenosis due to the presence of redundant skin in ventral floor of the patients' nares. After preparation, patients underwent nasal stenotic corrective surgery. During this surgery, the redundant skin in the ventral floor of the both nostrils was resected and the defect was repaired with single pedicle advancement flap technique. In one of the patients, in addition to skin resection, a part of the alar cartilage was removed as needed. Finally, the patients were followed up to three months after surgery, fortunately, postoperative outcomes were positive and none of the owners complained anymore. After the corrective surgery no respira-





tory distress and signs were seen and the technique seems completely satisfying.

**Keywords:** Airway obstruction, Brachiocephalic, corrective surgery, nares stenosis

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## Management And Treatment Of Tracheal Rupture In Two Mixed Breed Dogs

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Tracheal rupture can occur for variety of reasons, including biting, intubation, accident, and falling. Tracheal rupture is an uncommon but potentially life-threatening condition in small animals. Early identification of associated clinical signs and the use of appropriate diagnostic and therapeutic techniques are important to patient survival. A 1.5-year-old male Afghan and a 4-year-old male Husky were referred to the Ferdowsi veterinary hospital, with similar respiratory symptoms. Dogs were bitten a few days before admission. Common symptoms included difficulty breathing, coughing, dehydration, lacerations around the neck area, and subcutaneous emphysema. The radiograph demon-



strated presence of air in the neck and shoulder area in two dogs. The tracheal rupture was diagnosed according to clinical examinations and radiological evaluation. After stabilization of body general conditions, endotracheal intubation was performed. The trachea was reached by making a ventral midline incision from the neck area. In the Afghan dog, the ruptured forth tracheal ring and fifth tracheal ring were sutured together by simple interrupted suture pattern. A simple interrupted suturing technique was used for tracheal anastomosis after tracheal segment resection (4 rings) in the Husky dog. Then several tension-relieving sutures were inserted to prevent the anastomotic site from rupturing. They recovered without any specific side effects. Post operatively for three days, glucocorticoid, and for seven days broad-spectrum antibiotics were used. The follow-up period was six months. The results of tracheal resection and anastomosis surgery were satisfactory in two dogs and the trachea was healed without significant stenosis. This case report presents the diagnosis and treatment of two dogs with tracheal rupture.

**Keywords:** Tracheal rupture, dog, emphysema

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## Extraluminal Stents For Tracheal Collapse Correction

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Tracheal collapse syndrome is a chronic progressive disease in dogs that is more common in small and miniature dogs such as the Yorkshire Terrier, Maltese, Pug, Poodle, and Pomeranian. Possible causes of this complication are divided into two general categories. The first category is dynamic airway obstructions, which are caused by loosening of the cartilage that makes up the trachea and weakness of the tracheal muscles. The second category is static airway obstruction, which is caused by deformed tracheal cartilage and in recent studies, most reports have been static. One of the most important symptoms of this disease is Goose sound, which is exacerbated by pressure on the trachea, excitement, or hot and humid weather. Other symptoms of this disease include dyspnea. Gathering information through signaling, patient history, clinical examination observations, diagnostic imaging, laryngoscopy, tracheoscopy, or bronchoscopy, as well as laboratory findings (hematology and biochemical tests) can help diagnose the disease. This disease should be differentiated from other diseases that cause chronic cough or respiratory distress such as bronchitis, tonsillitis, brachycephalic syndrome, etc. The treatment of this complication is done in two ways: medical and surgical. In the category of medical treatments, there are two acute and chronic conditions, and for the category of surgical treatments, there are intraluminal and extraluminal conditions. A female dog was referred to the Small Animal Hospital of the Faculty of Veterinary Medicine, University of Tehran, due to the production of goosebumps. After clinical examination and radiography, the tracheal collapse was confirmed on the level of C4-C5. The hematology test of the patient was normal with a slight decrease in red blood cells that did not preclude surgery. Surgery was performed as extraluminal stents. One year after the surgery, the patient went to the hospital to correct the fracture of the humerus and there was no problem for the patient in terms of anesthesia.

**Keywords:** tracheal collapse, dog, Extraluminal stents

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## **Report of 3 cases of Feline Injection-Site Sarcoma, including diagnosis, pathology, chemotherapy and surgery**

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Feline injection-site sarcomas is one of the rarest and most malignant skin tumors in cats. The prevalence of this tumor is one case per 10,000 vaccinated cats. And the prevalence of this tumor has been higher following Rabies and FeLV vaccination. The pathogenesis of this disease is unknown. However, the most accepted hypothesis is that a local post-vaccination (or injection) inflammatory process leads to neoplastic transformation.

The typical initial diagnostic step involves fine needle aspirate cytology. Given the locally invasive nature of these tumors, advanced imaging such as contrast-enhanced CT or MRI is typically necessary to determine the extent of disease prior to an attempt at excisional biopsy. Chest x-rays are necessary to determine whether there is any evidence of metastasis (spread) to the lungs. Surgery is the mainstay of treatment for injection-site sarcoma but Multi-modal therapy, based on aggres-



sive surgical removal of the tumor in combination with radiation and/or chemotherapy, is usually recommended.

During 2020 to 2021, at different intervals, 2 cases of DSH male cats aged 7 and 12 years and one case of 7-year-old Persian male cat due to swelling and abnormal mass in the interscapular area were referred to the Veterinary Clinic. In the history of vaccination, all three cats had a history of vaccination in the past several weeks before a mass in the interscapular region. After physical examination and the presence of a mass after three months of vaccine injection and a large diameter of the mass more than 3 cm and continuous growth of tumors was observed. All three cats were evaluated by ultrasound and in Ultrasound images of the mass were observed subcutaneously with irregular margins and heterogeneous eco-texture and marginal blood supply. Chest radiographs were taken in all 3 cats, and in all 3 cats, radiographs showed no evidence of metastasis. According to the ultrasound images and the location of the mass, the patient was sent to the surgical ward for excisional biopsy. In the pathology report, Fibrosarcoma was diagnosed in two cases and Malignant Fibrous Histiocytoma in one case. In cases 1 and 2, after the diagnosis of Fibrosarcoma, chemotherapy was performed with doxorubicin at a dose of 25 mg/m<sup>2</sup> intravenously every 3 weeks for 9 treatments. In case 3, with diagnosis of Malignant Fibrous Histiocytoma, chemotherapy was performed with doxorubicin at a dose of 25 mg/m<sup>2</sup> intravenously every 3 weeks for 6 treatments and Superficial radiotherapy method was performed for 4 weeks.

Unfortunately, recurrence of tumors was observed in all three cases 3 months later, despite the treatments performed. At the request of all three cat owners, re-surgery was performed and previous treatments were ordered and the follow-up of the patients' treatment process in this study was as follows: In case number 1, after 3 surgeries and despite chemotherapy, the tumor recurred, and this case was euthanized at the request of the owner of the animal. In case number 3, which underwent radiation therapy and chemotherapy, the tumors recurred less quickly, but the masses existed and recurred and enlarged, but at the request of the animal owner, the case continues to live.

Finally, due to the rarity of this type of tumor, but the referral of 3



patients in the same year and in a private veterinary center shows the importance of vaccination in the lowest area of the limb, because in the event of a tumor, amputation can be done easily.

Keyword: Surgery, Vaccines, cats, Sarcoma, chemotherapy, radiotherapy

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## Cholecystoentrostomy In A 6-Year Cat With History Of Chronic Biliary Tract Obstruction: Case Report

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**History:** A 6-year-old neutered female cat with a history of anorexia, lethargy, and progressive jaundice for two months was referred to Small Animal Hospital, Faculty of Veterinary Medicine, University of Tehran. Clinical and pre-clinical examinations were performed (hema-



tological analysis, biochemical analysis, plain radiography, and ultrasonography).

**Clinical findings:** Clinical signs were weight loss, severe jaundice, pale stools, and abdominal pain. Hematological analysis showed normocytic normochromic anemia with leukopenia. Also, schistocytes and keratocytes were seen in the blood smear. The biochemical analysis revealed a severe increase in liver enzymes including AST, GGT, and ALP. Serum total bilirubin was also 70 times the normal threshold. In addition, a decrease in serum urea and total protein and hypocalcemia were seen in the biochemical panel. Radiography showed no obvious clinical signs, but ultrasonography revealed an increase in liver echogenicity with an increase in gallbladder size.

**Diagnosis:** Based on clinical and pre-clinical examinations, extrahepatic biliary tract obstruction was diagnosed. The patient underwent exploratory laparotomy to confirm the diagnosis, during which severe dilation of the common bile duct was seen. Differential diagnosis includes filling-defect lesions (masses, neoplasms, abscesses, etc.), diffuse infiltrative liver disease, infectious hepatitis, toxic hepatitis, cirrhosis, liver failure, biliary cyst, pancreatitis, cholangitis, etc.

**Treatment:** Cholecystojejunostomy by roux-en-y method was performed, in which part of the jejunum is incised and removed from the GI tract and an anastomosis is given to the gallbladder to function as bile ducts in the future. The proximal detached portion of the jejunum is also anastomosed end-to-side to the distal portion attached to the bile to allow food to pass through. Two years after surgery, despite the expected liver complications such as cholangitis and increased liver enzymes, the patient is in good clinical condition and has returned to normal life.

**Keywords:** Cholecystoenterostomy - Bile duct obstruction – Cat

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## **Ureteroneocystostomy Due to Hydronephrosis Subsequent of Ligation of Ureter in 3 Years Old Female DSH Cat**

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A 3 years old female neutered domestic short hair (DSH) cat was referred with history of lethargy, pollakiuria, polydipsia, vomiting and diarrhea after ovariohysterectomy. The signs have been present for 2 weeks without any improvements after en-block procedure.

serum biochemistry hematology revealed mild leukocytosis, high concentration of blood urea nitrogen and creatinine. evaluation and intravenous pyelography confirmed hydronephrosis in left kidney with accompanying complete obstruction in left ureter, it also revealed nephropathy in right kidney which may be due to glomerulonephritis.

After complete evaluation of the condition achieving from diagnostic tools, emergency exploratory surgery was performed for treatment of ureteral obstruction and hydronephrosis. After induction of anesthesia the patient positioned in dorsal recumbency and was prepared for aseptic surgery. Exploratory laparotomy revealed severe adhesion formation between and around cervix and bladder neck especially in left side. Left ureter was dilated in almost all of its length except distal part which entrapped in adhesions. Left pelvis was severely dilated, too. Urinary bladder, right and left kidney and right ureter were seemed normal in size, shape and color.





Distal aspect of Left ureter was isolated from Adhesions and ureteral attachments and excised. To perform intravesicular ureteroneocystostomy, the injured ureter near the bladder was resected and reimplanted into the dorsal aspect of bladder lumen through a ventral midline cystotomy. Because tension along the anastomosis remained a concern as a result of shortening of left ureter, a renal descensus and a left sided cysto-nephropexy performed.

Patient has been followed by laboratory monitoring and ultrasonographic examination after the surgery. Biochemistry blood test result has fluctuated in first 14 days after surgery then decreased to normal range. The all management led to turning the mentioned cat's life circumstance back to normal after twelve months postoperatively which evaluated by clinical examination and by ultrasonography.

**key words:** Hydronephrosis, Glomerulonephritis, ureteroneocystostomy, azotemia, ureteral obstruction

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### **Feline Aortic Thromboembolism: Examination, Diagnosis And Surgical Treatment**

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A seven-year-old intact male Persian cat was referred to small animal hospital, Faculty of Veterinary Medicine, University of Tehran for management of an aortic thromboembolism. It was presented with sudden onset of hind limb paralysis. Clinical examination revealed absence of femoral pulses and cold extremities. In addition, all neurological reflexes and deep pain sensation were negative. Echocardiography showed thickened left ventricular walls associated with prominent papillary muscle. Ultrasonography of the abdominal aorta confirmed a thrombus before the aortic trifurcation. It revealed an echogenic structure with the size of 19\*3 mm. This obstruction has been preventing the caudal part's blood supply. Medical treatment started by prescription of thrombolytic therapy, but no significant change was visible. As a result, the cat underwent surgical thrombectomy. A standard caudal celiotomy was performed and the abdominal aorta was identified. Rummel tourniquet was used in order to attenuate the blood circulation in the zone, temporarily. After thrombectomy, sterile saline was used for flushing the aorta. Then, aorta sutured by 6/0 prolene material with simple continuous pattern. Operation resulted in a good outcome. Blood supply and pulses returned to its normal condition immediately after surgery and a few hours later, taking care of the case in ICU, hind limb's tremor was noticeable. Post-operative long-term medication included aspirin, furosemide and enalapril. 6 months after surgery, the cat was free of clinical signs. However, 14 months post operationally as the owner did not follow the medication properly, recurrence of arterial thromboembolism was reported. Thrombectomy therefore could be considered as an effective treatment.

**Keywords:** Thromboembolism – Cat – Aorta – Paralysis – Hind limb

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## **Clinical Application Of Ct Scan As A Diagnostic Method As Well As Surgical Intervention In A Type Iia Left-To-Right Pda- A Case Report**

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Failure to close the embryonic connection between the aorta and the pulmonary artery shortly after birth causes the most common congenital heart failure in dogs which is called Patent ductus arteriosus (PDA). Poor prognosis of this disease in case of uncorrected ones and an about 64% report of mortality in the first year of the life, uncorrected ones, illustrates the importance of diagnosis and treatment in this congenital deficiency. This article is reporting a 7-month-old intact female Spitz dog in which a type IIA left-to-right PDA was diagnosed for him as an incidental finding following suspicious symptoms of precastration examinations of the dog. On initial preoperative examination, auscultation demonstrated continuous murmur grade V/VI with point of maximal intensity (PMI) at base of the heart on the left side. Hence, echocardiography was strongly recommended and Patent ductus arteriosus was diagnosed. For further studies and surgical intervention, the case was referred to the Department of Surgery and Radiology, Faculty of Veterinary Medicine, University of Tehran. The findings of computed tomography assessment with intravenous administration of iodinated



contrast medium (850 mg of I/kg VISOPAQUE), including a complete tapering funnel-shaped patent ductus arteriosus which was connecting proximal descending aorta to main pulmonary artery with the size of 0.8\*4 mm in diameter and 1.3 mm in length at the level of T4-T5 with mild dilation of mentioned arteries, confirmed a type IIA PDA. In order to disrupt the blood flow from aorta to pulmonary artery and prevent CHF, pulmonary edema and other consequences of PDA, surgical correction of PDA was performed by Ligation of the PDA with standard approach through a left fourth space intercostal thoracotomy. To control the possibility of pneumothorax, chest tube was placed before thoracic closure for about 12 h postoperation. The dog was reported asymptomatic on re-examination and follow-up studies 5 weeks after the surgery. This report can be considered as a confirmation of the accuracy of computed tomography in conclusive diagnosis of patent ductus arteriosus and also a good prognosis for surgical correction of this congenital deficiency in cases of timely diagnosed and absence of pulmonary edema and congestive heart failure.

**Keywords:** congenital abnormalities; vascular ring anomaly; patent ductus arteriosus

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## **Hemimaxillectomy for the Treatment of a Large Oral Tumor in a Dog**

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A 3 years old intact male German Shepherd was referred to the Faculty of Veterinary Medicine, University of Tehran. on presentation, there was a lobular mass at the level of right maxillary third premolar tooth (No.107) occupying both buccal and palatal region of the gingiva with attachments to the hard palate. Other clinical signs included bloody salivation, nasal discharge, displaced teeth, halitosis, anorexia and weight loss. For further para clinical evaluation, Computed tomography was performed under general anesthesia. Based on plain and post contrast CT scan examination of the skull, there was a contrast enhanced soft tissue attenuated mass lesion with a size of 7\*2.6\*2.5 cm in right dorsal aspect of oral cavity at the level of tooth No.107 which extended to nasopharyngeal meatus, right retrobulbar space and right nasal cavity. Finally, tumor resection with caudal hemimaxillectomy technique was selected as the treatment of choice. GA protocol for the operation included propofol (6mg/kg) as induction agent and isoflurane for maintenance after endotracheal intubation. tracheostomy was performed to maximize surgical visualization of the surgical region plus enhancement of the surgical site aseptic condition. To reduce hemorrhage in further hemimaxillectomy, temporary ligation of right carotid artery was performed using Rummel tourniquet technique. For the main procedure the patient was placed in left lateral semioblique recumbency, and Oral cavity was prepared aseptically with antiseptic solution (chlorhexidine 0/2%). In order to enhance surgical site exposure, the external aspect of the mass was resected then a buccal flap was created and for osteotomy incisions an oscillating saw was used. For prevention of the most common complication post extensive maxillectomy being dehiscence and a probable subsequent oronasal fistu-



lae, two techniques were used: first the buccal gingiva flap which was premade and secondly 5 holes were drilled in the hard palate and the flap was secured to aforesaid holes using PDS 3-0 as a tension relieving technique. A second layer of closure was performed using 3-0 PDS in a simple interrupted pattern, apposing buccal and palatine mucosa and submucosa. postoperation, the mass was sent for histopathology evaluation and fibrosarcoma was definite diagnosis. About 4 months post operation a soft tissue swelling was observed and CT scan was obtained again and tumor recurrence was diagnosed. Finally, the case was euthanized with respect to the owner's decision. This case report shows that wide resection surgery increases the quality of life from the time of surgery until the mass was recurred.

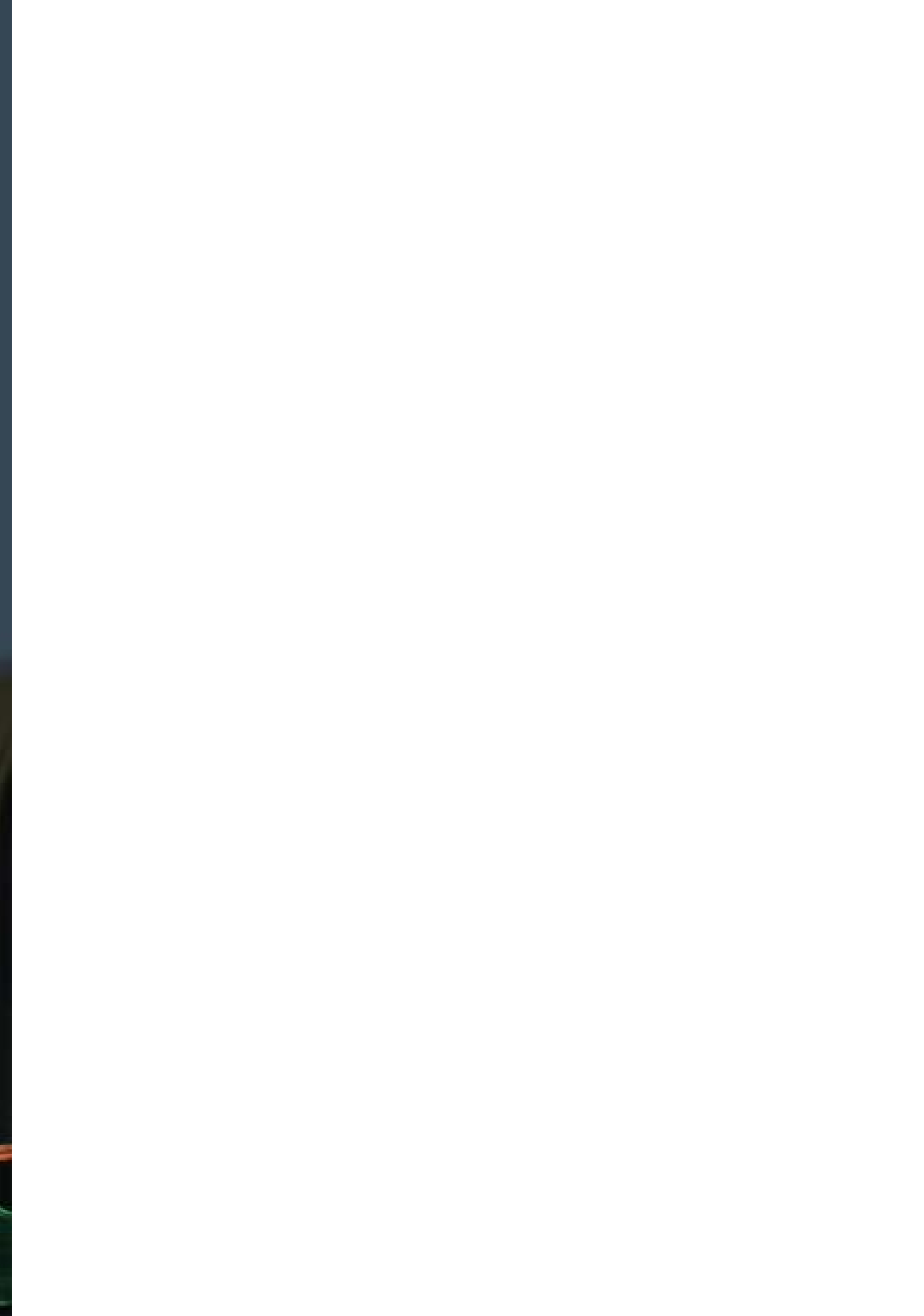
keywords: hemimaxillectomy, oral tumor, dog.

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# Poster Presentations of ISVS and ISVSAD









## Evaluation Of Anesthetic Effects Of Ketamine-Atropine-Xylazine-Diazepam Combination In Comparison With Ketamine-Xylazine In Rats

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A safe and reliable method for anesthetizing rats has long been a leading concern of biomedical researchers. We recently found out in a pilot study that the intraperitoneal administration of ketamine combined with atropine, xylazine and diazepam is safe for rat anesthesia. In this study, 20 male Wistar rats were divided into two equal groups of 10. One group received a combination of ketamine-xylazine-atropine-diazepam (KARD) and the other group received a combination of ketamine-xylazine (KR) the most common and available anesthetic combination intraperitoneally (IP). The depth of anesthesia, induction time, loss of pedal withdrawal reflex, pulse rate, SpO<sub>2</sub>, body temperature and respiratory rate were evaluated, along with the duration and quality of induction, surgical anesthesia, and recovery. Physiological parameters in the KARD group were maintained within the normal range and showed fewer changes than in rats in the ketamine-xylazine group. The combination of KARD induced anesthesia in all rats, while the ketamine-xylazine combination induced anesthesia in only seven rats. In this group, two rats did not reach the appropriate level of anesthesia and one rat died. The combination of KARD provided a predictable induction and sufficient hypnosis and muscle relaxation. Sufficient surgical anesthesia (loss of pedal withdrawal reflex) time was readily achieved with this protocol. In conclusion, combination of ketamine (100 mg/kg), Atropine (0.4 mg/kg), xylazine (2 mg/kg), and diazepam (5 mg/kg) is a safe and practical technique for intraperitoneal anesthesia in rats, providing a surgical window of 45 min, with acceptable recovery time.

Keywords: Rat, Anesthesia, Combination of ketamine-atropine-xylazine-diazepam.

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## **Applying Intranasal Pre-Anesthesia Sedation And Total Intravenous Anesthesia (Tiva) In Flamingo (Phoenicopterus Roseus), Undergoing Amputation; Challenges And Solutions**

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Most species of nondomesticated birds may react adversely to handling, which is required during medical and surgical procedures. Chemical restraint of captured birds is necessary to avoid stress, anxiety, and struggling that may reduce the chances of survival after a procedure. Because IV injection is difficult, the usual route of administration is via IM or SC injection. Intramuscular injection is generally accomplished in the pectoral muscles, which may involve the risk of accidentally puncturing large vessels or penetrating the coelomic cavity. Injections in the thigh muscles may increase the potential for nerve damage. Because birds have a renal portal system, excessive excretion through the kidneys may reduce drug bioavailability after injection of medication into the thigh muscles. Following IM injection, signs of considerable pain may develop, particularly with irritant agents. To avoid the pain and anxiety associated with IM injections, the intranasal route of drug administration has been evaluated for the induction of sedation in animal. Birds have unique anatomical and physiologic features that have an important impact on anesthesia. A flamingo was taken to our clinic



as a result of unsuccessful surgery in another center, after traumatic wing fracture. Surgeon decided to amputate the wing. Administration of intranasal midazolam (2 mg/kg) as a pre-anesthesia and intravenous ketamine (20 mg/kg) with diazepam (0.2 mg/kg) for induction and maintenance of anesthesia was done. Orthopedic surgery and anesthetic recovery were done without any complications. This protocol made acceptable anesthetic and recovery period in flamingo, when inhalation anesthesia is not available.

Keywords: flamingo, intranasal pre-anesthesia sedation, intravenous anesthesia.

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## **Evaluation of the effects of aminophylline on cardiopulmonary parameters and quality of recovery in total intravenous anesthesia with propofol in castration of male dogs**

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Many surgical complications, occur during recovery time. Accelerating the recovery period can reduce some of these problems. The aim of this study was to evaluate the effects of aminophylline, on cardiopulmonary parameters and the quality and time of recovery from propofol-induced anesthesia, in dogs. In this study, 10 adult male dogs with an average weight of 20 kg were used which were randomly divided



into two groups of 5. After inserting the IV catheter in left cephalic vein, 1% acepromazine HCl (0.2mg/kg) was administered intravenously as premedication. After 15 minutes, anesthesia was induced in all dogs by IV injection of propofol (3mg/kg). The maintenance dose of propofol was calculated to be 0.3mg/kg/min, which was added to 5% dextrose solution in a microset. The duration of castration in all dogs according to the experimental sample was about 20 minutes. At this time, the injection of propofol was stopped and in the treatment group, aminophylline was injected intravenously (10mg/kg) and in the control group a similar volume of normal saline was injected. Anal temperature, respiratory rate, heart rate, indirect blood pressure and SpO<sub>2</sub> at times; before premedication, 15 minutes after that, 5, 10, 15 and 20 minutes after induction of anesthesia, 5 and 10 Minutes after injection of aminophylline or normal saline and at time of complete recovery were recorded. The quality of anesthesia and recovery was evaluated and the times to the tracheal tube removal and lift the head for the first time were measured. In treatment group the time to remove the tracheal tube (return of the swallowing reflex) and the time to lift the head for the first time were significantly reduced and the quality of recovery was improved significantly ( $P < 0.05$ ). Also the other parameters related to the quality of anesthesia were significantly higher in the treatment group ( $P < 0.05$ ). But the Anal temperature and SPO<sub>2</sub> were not significantly different between the two groups ( $P > 0.05$ ). According to the results of this study, intravenous administration of aminophylline (10mg/kg) at the end of propofol TIVA, can reduce the time of recovery and improve the quality of anesthesia.

Keywords: Anesthesia, aminophylline, propofol, recovery

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## Comparison Of The Effects Of Ketoprofen And Meloxicam On Glutathione Pathway In Ketamine-Xylazine Anesthesia In Rats

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Oxidative stress is one of the side effects of anesthesia and surgery. Therefore, the use of appropriate analgesics in patients undergoing surgery is necessary to reduce the pain and prevent the increase of oxidative stress factors (glutathione pathway). The aim of this study was to compare the effects of ketoprofen and meloxicam (NSAIDs) on the glutathione pathway in ketamine-xylazine anesthesia in rats, in order to suggest a more appropriate analgesic and anti-inflammatory drug with less complications for surgery in this anesthesia protocol. 80 male rats aged 5 weeks were purchased. Before any injection, 5 rats were sampled from the heart after inhalation superficial anesthesia using ether. Then 75 rats were randomly divided into 3 groups of 25. Thirty minutes before induction of anesthesia, the control group received saline and the experimental groups 1 and 2 received ketoprofen (5 mg/kg) and meloxicam (2 mg/kg) respectively by subcutaneous route in the same volume. All rats were then anesthetized with xylazine (5 mg/kg) and ketamine (75 mg/kg) by intraperitoneal injection. For each blood sampling 5 heads from each group were selected randomly in times; before induction, 30 and 60 minutes, and 24 and 48 hours postinduction. The serum levels of oxidized glutathione, glutathione, glutathione peroxidase and glutathione reductase were measured by calorimetry using commercial kits. The results of the present study showed that anesthesia with ketamine-xylazine changes the markers of the glutathione pathway associated with oxidative stress. According to the findings of this study, ketoprofen and meloxicam significantly ( $P < 0.05$ ) increase glutathione, decrease glutathione oxide, increase total glutathione and glutathione oxide and the ratio of glutathione-to-glutathione oxide and increase glutathione peroxidase activity. However, they have high in-



hibitory effects on glutathione reductase. These findings showed that the balance between stress indicators due to general anesthesia, and the glutathione pathway is better maintained by ketoprofen under 24 hours. But meloxicam maintains this balance better after 24 and 48 hours. Therefore, in surgeries where analgesia under 24 hours is more important, it is better to use ketoprofen, and if analgesia after 24 and 48 hours is important, it is better to use meloxicam.

**Keywords:** Ketoprofen, meloxicam, glutathione, anesthesia, rat.

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## **Evaluation Of The Effects Of Ketamine-Diazepam And Ketamine-Xylazine On Saturation Of Arterial Blood Oxygen And Changes In Oxidative Stress Parameters In Dogs**

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The present study aimed to evaluate the effects of two anesthesia regimens, including ketamine-diazepam and ketamine-xylazine on arterial blood oxygen saturation (SpO<sub>2</sub>) and oxidative markers in the dog. Eight male healthy dogs were selected and were divided into two groups of four subjects. Following the assessment of clinical signs, SpO<sub>2</sub> was measured using a pulse oximeter and first blood samples were taken. Next, the dogs in two groups received diazepam (1 mg/kg) and xylazine (1 mg/kg) respectively. After 10 minutes of administration and re-examination of SpO<sub>2</sub>, induction of anesthesia with ketamine 10% (10 mg/kg) was performed and the animals were prepared for castration surgery. The SpO<sub>2</sub> was measured and recorded every 5



min until the end of the operation. Blood samples were taken again in the middle of the surgery and the third sampling was performed after the termination of the surgery. Our results demonstrated that SpO<sub>2</sub> was reduced significantly in both groups 5 min following the initiation of anesthesia. Moreover, the decreasing trend continued until 20 min in the xylazine group, compared to the diazepam group. In both groups, SpO<sub>2</sub> tended to return to the primary state and elevated at the end of the anesthesia when ketamine injection was ceased. Furthermore, laboratory evaluation showed that antioxidant levels and superoxide dismutase activity declined during the time. However, the latter reduction was not statistically significant neither in the groups nor between the groups ( $P>0.05$ ). Nitric oxide (NO) level in both groups was different between pre-operation (T<sub>0</sub>) and during the operation (T<sub>1</sub>) times ( $P<0.05$ ). Our findings showed that serum NO during surgery had a more prominent elevation in the diazepam group, compared to the xylazine group. Considering the role of NO in regulating oxygen during surgery and its influence on decreasing oxidative stress, diazepam-ketamine combination functions better concerning SpO<sub>2</sub> and reduces oxidative stress, in comparison with the xylazine-ketamine regimen. Consequently, this combination could be preferred for short surgeries in dogs.

**Keywords:** Ketamine, xylazine, diazepam, oxidative stress, pulse oximeter

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## **Determination Of Bupivacaine And Iohexol Mixture Spread Following Spinal Anesthesia In Dogs**

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Neuraxial anesthesia including spinal and epidural anesthesia is widely used in human and veterinary medicine. The excessive cranial spread of the injected drug in either method can be associated with hazardous cardiovascular side effects. Therefore, determination of drug spread, especially for subarachnoid injections, is of importance. The objective of the present study was to determine the spread of a mixture containing bupivacaine and iohexol following injection to subarachnoid space in dogs. Twenty-one dogs were randomly and equally divided into three groups of Spinal G1 (table without slope), Spinal G2 (15 degrees slope to the head), and Spinal G3 (15 degrees slope to the tail). Injected compound was bupivacaine (0.5%) 0.22 mg/kg and iohexol (300 mg iodine/mL) 0.08 mL/kg. The injection rate in all four groups was 1 mL/40 seconds. After injection, lateral radiographs were taken at 0, 5, 10, 20, 30 and 40 minutes. The results showed that the maximum spread of the mixture in the dogs was T12 in Spinal G1, T11 in Spinal G2, and T12 in Spinal G3. Blood pressure in all groups showed a decrease over time with no significant differences among treatments. In conclusion, the cranial spread of injected mixture showed no significant difference in terms of the cranial spread in radiographic evaluation in dogs. Decrease in blood pressure was observed in all three treatments.

**Keywords:** Bupivacaine, Iohexol, Spinal

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## **Report Of Home Sedation In A Chow Chow Dog**

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Sedation in animals that suffer from fear and stress and are aggressive towards their surroundings is always a challenge for the patient and anesthesia staff. However, sedatives are mainly administered by intramuscular and painful injections, which can exacerbate stress in the animal. Therefore, the use of methods that reduce the stress of the animal in going to the clinic can both reduce the risk of bites and injuries to staff and will create greater confidence in the patient. Oral sedatives may be helpful in such cases. A patient of a non-sterile one-year-old male dog named Shoga from the miniature Chow Chow breed weighing 20 kg presented with symptoms of right leg pain for 4 days. The animal did not allow the surgeon to examine and radiograph. Therefore, due to incomplete clinical examination, the diagnosis was made on patellar dislocation of the knee and the patient was given a turn for the next day for diagnostic and therapeutic measures. Due to the aggressiveness of the patient and the accompanying sensitivity, the anesthesia team decided to administration sedatives from home. For this purpose, chlorpromazine under the brand name Normazine 25 of Tehran Shimi Company for the patient in the amount of 2.5 mg/kg twice in the night before surgery with the last meal and an hour and a half before referral to the clinic with An interval of 8 hours was prescribed. According to the patient's history and clinical examination, there was no particular problem with the patient's health. On the morning of his



return, Shoga easily allowed the surgeon to examine him and had the least reaction to the pain. After radiography and confirmation of grade 3 patellar displacement, IM sedation with a combination of 2.5 mg/kg ketamine and 0.12 mg/kg midazolam was administered for Shoga. Patient preparation and induction of anesthesia were performed well and in the recovery phase of anesthesia, the animal was sternal and discharged after half an hour. According to this report, it can be concluded that chlorpromazine can be used in stimulated, aggressive and healthy animals to reduce stress at the mentioned dose from home.

**Keywords:** Sedation, Chlorpromazine, Anesthesiology and critical care  
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## **Aspirated Endotracheal Tube In A Cat – Case Report**

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An intact male DSH cat weighing 2.1 kg was anesthetized for radial fracture repair at a teaching veterinary establishment. The cat was premedicated with acepromazine (0.05 mg/kg) - methadone (0.25 mg/kg) and anesthesia was induced by intravenous (IV) co-administration of 0.25 mg/kg midazolam and 5 mg/kg ketamine mixed in the same syringe and administered via a 22 gauge catheter inserted in the cephalic vein. Since the cat was apneic, quick intubation using a 3-mm uncuffed endotracheal was performed. During connection of tracheal tube to wye piece, the endotracheal tube adapter detached from the tube and



the tube disappeared from sight in the mouth and pharynx. Since the ventilation and O<sub>2</sub> saturation on the pulse oximetry was normal, it was thought that the tube has been lost in the esophagus. Therefore, the cat was easily reintubated with another 3.5-mm cuffed endotracheal. A lateral thoracic radiograph confirmed the presence of two ET tube in successive order in the trachea. Since the breathing pattern, O<sub>2</sub> saturation were normal and the cat seemed to be stable, the fracture repair was performed under isoflurane anesthesia. Following the completion of orthopedic surgery, the first endotracheal tube was removed through midcervical tracheostomy with an alligator forceps while the 2nd tracheal tube was kept in place in order to continue inhalation anesthesia. During the procedure, all vital parameters (HR, RR, SpO<sub>2</sub> and EtCO<sub>2</sub>) were within normal ranges. The second ETT was removed at the end of anesthesia following the return of the protective swallowing reflex. The cat received a single dose of dexamethasone (0.1 mg/kg, IV) in order to reduce airway edema and inflammation caused by excessive manipulation. The cat had an uneventful recovery. In the next visit a few days later, the cat was quite normal with no obvious complication. This case report highlights the importance of proper attachment of endotracheal tube to its adapter in order to reduce the possibility of tube aspiration during endotracheal intubation.

Keywords: endotracheal tube, aspiration, adapter, cat

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## **Evaluation of changes of superoxide dismutase following the injection of Aminophylline during anesthesia for castration of male dogs**

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Anesthesia and surgery are important causes of oxidative stress in the body. We can reduce oxidative stress by controlling and reducing the side effects of anesthetic drugs. Aminophylline is one of the drugs that can reduce the recovery time by affecting the cardiovascular system. The aim of the present study was to evaluate the effects of aminophylline on superoxide dismutase (SOD) during the recovery from Propofol-induced anesthesia in dogs. In this study, 10 adult male dogs with an average weight of 20 kg were used which were randomly divided into two groups of 5. Acepromazine was administered intravenously (0.02 mg/kg). After 15 minutes, anesthesia was induced in all dogs by injection of propofol (3mg/kg). Anesthesia was maintained by infusion of propofol; (0.3 mg/kg/min in 5% dextrose) via cephalic vein. The duration of castration surgical time in all dogs was about 20 minutes. At the same time, the injection of propofol was stopped and in the treatment group, aminophylline was injected intravenously (10 mg/kg) and in the control group a similar volume of normal saline was injected. Blood samples were taken before anesthesia (T1), one hour (T2) and 24 hours (T3) after which the red blood cells were isolated by centrifugation. For lysing the red blood cells, they were mixed with distilled water and centrifuged again. SOD were measured using a commercial kit. The recorded amounts of SOD in the treatment group were 569.08 (T1), 599.6 (T2) and 545.19 (T3) respectively. SOD was increased significantly in T2 ( $P < 0.05$ ). In control group they were 559.7 (T1), 562.09 (T2) and 557.18 (T3) respectively with no significant changes. These results show that aminophylline can increase the SOD during anesthesia; though it may decrease the oxidative stress in anesthetized dogs.

**Keywords:** Propofol, Aminophylline, superoxide dismutase

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## **Histomorphological Study Of The Effects Of Hydroethanolic Extract Of *Dracocephalum Kotschyi* On Skin Wound Healing In Diabetic Male Rats**

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**Background and purpose:** Diabetic ulcers and skin ulcers are an important issue in medicine. Diabetes is a metabolic disorder characterized by hyperglycemia due to impaired insulin secretion and dysfunction of the pancreas. *Dracocephalum kotschyi* Boiss is a medicinal plant in traditional Iranian medicine used to treat pain, fever, inflammation and seizures, and its decoction relieves rheumatic pains and wounds, and also strengthens the immune system. Studies have shown that some species of lemon balm have antibacterial, anti-flatulence, anti-diarrheal and soothing properties. Due to the medicinal properties of *Dracocephalum kotschyi* Boiss extract, this study was performed by histomorphological study of the effects of hydroethanolic extract of *Dracocephalum kotschyi* Boiss on the skin wound healing process in male diabetic rats. In this study, 50 male Wistar rats were divided into 10 healthy groups without treatment, healthy phenytoin 1%, healthy treated with osrine, healthy receiving 5% of plant extract, healthy receiving 10% extract. Percentage of plantain, untreated diabetic, diabetic treated with phenytoin 1%, diabetic treated with osrine, healthy receiving 5% of plant extract, healthy receiving 10% of plant extract. After anesthetizing the mice, we created a wound with an area of 4 cm<sup>2</sup> in the back of the animal and on days 3, 7 and 21 after wounding, different histopathological traits were examined and also on days 0, 3, 7, 21 the wound area was analyzed. In all groups, a significant difference was observed on the 21st day of sampling with the control group. Histopathological results of collagen production, vascular formation and proper epithelium production were also seen in diabetic and healthy groups receiving 10% golden plant extract. Subsequently, this decrease was observed in diabetic and healthy groups receiving 5% golden plant extract and also in the group treated with phenytoin. According to the results of



this study, it was found that the use of hydroalcoholic extract of *Dracocephalum kotschyi* Boiss in concentrations of 5 and 10% can have a beneficial effect on improving the healing process of skin wounds in healthy and diabetic rats. Also, compared to the common drugs used to heal these types of wounds, the use of hydroalcoholic extract of *Dracocephalum kotschyi* Boiss plant has better results.

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### Calculation And Software Designing Of Improved Socket Prostheses Model For Amputated Canine Forelimb In Carpal Region

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Increasing interests and demands for use of orthopedic prostheses (specially socket prostheses) in cases of amputation, highlights the need for research and applied design in order to improve the manufacture of these prostheses in the country. The aim of this study was to present new designs for artificial limbs that are producible and exploitable, to increase adaptability and eventually to facilitate postoperative rehabilitation process of dogs. This technical article proposes a set of



new solutions to improve the common problems and increase efficiency of socket prostheses for amputated frontal limb of dog by using mathematical tools, gait analysis of the model, and advanced computer modeling. The mentioned designs includes the use of PTFE (polytetrafluoroethylene) sheets to laminate two cross section contact surfaces of uniaxial joints to reduce friction and thus reduce energy dissipation, the use of polyethylene packages containing thixotropic non-Newtonian fluids (combined solution of sodium tetraborate decahydrate with polyvinyl alcohol) with high and extraordinary viscosity in order to incur a better weight and ground reaction force pressure distribution on the cross-sectional topology at the distal portion of the residual limb, and finally the use of a pistol-clad prosthetic claw equipped with spring to strengthen the dorsiflexion and plantarflexion torque and convert its momentum into propulsive force towards the motion vector necessary to obtain normal gait and also running. Comparing Analyzed results of mathematical calculations and computer modeling with performance of previous prostheses and previous researches resulted in improvement of function, reduction of friction and applying a harmonious pressure force and weight distribution as well as creating a suitable base for approaching normal gait. According to the results of this study, it seems that the widespread usage and manufacture of this modified prosthesis can lead to greater acceptance and prevent secondary complications of former prostheses, avoids further costs and expenses and ultimately animals comfort.

**Keywords:** Prosthesis, Amputation, Canine, Modeling

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## **Extraction Of Premolar (No. 208) And Molar (No. 209) In A Female Dlh(Tuxedo) Cat: A Case Report**

Teeth are consequential as an important part of the digestive system. About 70% of cats referred to veterinary clinics have periodontal and dental problems. With adequate training and performing home care by the owner, tooth loss can be prevented. To allow a tooth to be maintained, tooth extraction is recommended only if there is no other treatment option, (e.g. endodontic therapy and restoration methods). However, treatment by extraction is always preferable to leaving the pathological condition untreated. Some common conditions that generally require extraction include the following.

1. Advanced periodontitis: in many instances, when the periodontal destruction is excessive or home care is not effective, extraction is required.

2. Extensive destruction of dental hard tissue: In mild cases, restoration methods and endodontic therapy are recommended, while in advanced caries, and in the presence of resorptive lesions the treatment recommendation is extraction to avoid periapical pathology.

3. Persistent primary teeth: If primary teeth persist in place when their permanent counterparts start erupting, resulting in the development of malocclusion. Persistent primary teeth should generally be extracted early in the cat's life.

4. Malocclusion

5. Traumatic tooth injuries and fractures

A five-year-old neutered DLH (tuxedo) Queen with clinical signs of severe gingivitis and periodontitis, halitosis, dysphagia, unilateral chewing, Pain in the left maxilla, gingival resorption, Discoloration of teeth, and tooth movement, high accumulation of plaque and tartar referred to one of the clinics in Shiraz city. After Performing clinical examination, Susp. Metronidazole, 15 mg/kg, q12h was used to reduce inflammation and control the oral infection. After one week, the case was referred and after re-examination and surgical preparation, scaling was performed, teeth num.208 and num.209 were extracted and the cross mattress pattern was used as sutures. After surgery, Susp. Amoxicillin 250, 10 mg/kg, q12 was prescribed. Other care included: soft food and soup, to reduce local inflammation and maintain oral hygiene, silver nitrate oral spray for cats were used. The effect of treatment after one week was: the disappearance of bad breath, marked reduction of gingivitis,





and chewing and swallowing food easily. The homecare of the animal's oral hygiene should also be considered by the owner.

**Keywords:** Cat, Tooth extraction, Periodontitis, DLH

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## **Case Report Of; The Effects Of Using Silver Nitrate Solution Following Dental Scaling On The Preventing And Controlling Dental Plaque In Two Female, A 5-Year-Old And A 10-Year Old, Cats For One Year**

Dental plaque causes Periodontal disease, which is one of the most commonly diagnosed in the practice of cats. By age three, most cats show some degree of periodontal disease. Plaque formation can be mostly controlled after dental scaling, by proper oral hygiene and dental home care. According to recent studies, 76.8% of cat owners never brushed their pet's teeth which causes dental plaque formation and periodontitis development. The main reason is that cats don't allow brushing. In this article, the effect of using silver nitrate solution, instead of brushing, on preventing or controlling dental plaque and reducing gingivitis in two neutered female cats, a 10-year-old(Persian mix) and a 5-year-old(DSH), following dental scaling, 3 times a week for a year, was investigated. the results were a specific reduction of; plaque formation, Halitosis, and marginal gingivitis. For cat owners, using dental solutions and sprays are more easily than brushing teeth. furthermore, it takes less time to do.

**Keywords:** silver nitrate, periodontitis, cat, dental scaling

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## **A Study Of The Effects Of Blind Wolf Teeth In Equines**

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Wolf teeth are small (often tiny) teeth that can be found immediately in front of the first upper cheek teeth. They erupt at 6-18 months and vary considerably in size and position : they can also rarely be found in front of the first lower cheek teeth. Wolf teeth (pre-molar tooth number 1), in some equines, appear more on the upper jawbone. This tooth is known as a hidden wolf tooth if it does not come out of the gums. In some cases, the tooth continues to move in a downward anterior direction below the gums. Wolf teeth sometimes lead to injuries and side effects on the horse's health. In the latent state of growth, pressure on the gums leads to destructive effects on the feeding, digestion and general health of mares. A mare (Arab, age 21 months) with signs of inflammation and swelling in the anterior region of the pre-Asian tooth No. 2 in the upper jaw bone (left), decreased nutrition, increased head movements (due to pain) was observed in the equestrian club . After clinical examination, diagnostic imaging was used. Our diagnosis was the presence and improper growth of an ungrown wolf teeth. After placing the horse in the box, the large animal was extracted using a mouth opener and appropriate anesthesia. Due to the lack of a long period of tooth growth, the periodontal ligaments were not very wide, but the Elevator



tool was used to remove the minimum connections. The loose tooth was removed by forceps and the animal's gums were cut. Studies have shown that the horse improved, and returned to her previous nutrition and head movements had eliminated. Improper growth of this tooth, in addition to its destructive effects on bone tissue, affects the proper functioning of the dental and gastrointestinal tract, and ultimately the general health of the animal; To reduce the destructive effects, special attention should be paid during tooth eruption; Periodic examinations can also prevent preventable problems.

**Keywords:** Wolf Teeth, Equines, Oral and dental diseases

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## **Evaluation Of Dental Diseases Effects On The Gastrointestinal Tract In Rabbits**

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In this study the effect and involvement of rabbit oro-dental diseases on the gastrointestinal tract and gastrointestinal diseases, while recognizing the treatment methods was investigated. The anatomical structure of rabbit teeth was evaluated based on superior references and used as a reliable source. A questionnaire was designed in veterinary clinics in Tehran and Kerman in order to collect information about the above plan and helped the



study findings. The rule of teeth in nutrition is quite obvious. Different diets in rabbits, anatomical differences in maxillary and mandibular teeth, as well as various chewing movements contribute to the health of the teeth and ultimately the health of the rabbit. Also, the presence of elements such as silica in the rabbit's diet can be helpful in maintaining healthy teeth. Early attention to the effect of teeth on rabbit gastrointestinal diseases helps us to prevent many gastrointestinal problems and, if the disease occurs, to prevent further progression. Rabbits with oral cavity diseases not only have difficulty eating, but also elongation of tooth roots can cause damage to sinuses, followed by nasal discharges and ocular discharges. In rabbits, the teeth grow throughout life, and if the food is not properly placed to wear the teeth, there is a possibility of excessive lifting of the teeth and subsequent injuries. Gastrointestinal diseases occur in rabbits with clinical symptoms such as anorexia, weight loss, diarrhea, cecotrops feces accumulation in the anal area and many other signs. The replacement or modification of the rabbit's diet with the addition of maximum abrasive elements in the primary stages, as well as trimming teeth or trimming the tooth distances in the advanced cases, can prevent its secondary effects on endangering the oral cavity and gastrointestinal tract health of rabbits.

**Keywords:** Tooth - Rabbit - Gastrointestinal tract

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## **Report of a malocclusion in anterior teeth of a male rabbit**

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Acquired tooth disease are considered a progressive syndrome which cause change in the structure , shape and position of the teeth. The nonexistence of proper friction on teeth surface Due to insufficient fi-



ber in the diet And also the lack of some mineral such as calcium , vitamin D ,vitamin A ,magnesium and protein cause acquired tooth diseases.A mature male rabbit with symptoms of severe progressive curvature in anterior teeth in the power jaw was brought to the clinic which after the examination of the general condition of the patient we began the treatment .first with the subcutaneous injection of 0.15 mg/kg of ketamin and 0.25 mg/kg medetomidine we put it under anesthesia , then we kept its mouth open and whit an electric razor. We attempted to polish and cut the teeth.to avoid damaging the soft texture and heat. Injuries to tooth pulp we used a tongue protector to collect the tongue and we used water to keep the teeth's surface cool.It was also important not to cut the teeth too short because in that case the would not be able to chew food that contains fiber and because the animal is susceptible to anorexia of post operation , it will cause GI stasis and liver lipidosis .growing teeth that suffer from malocclusion are always subjected to periodic adjustment of teeth and because of this a suitable diet would slow the disease progression and prevent lack of nutrition which lead to stronger teeth texture and protection against periodental infection.

**Key words:** malocclusion , rabbit , diet

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## **Evaluation Of Antimicrobial And Cytotoxic Effects Of Herbal Extracts(Zataria Multiflora, Echinacea Purpurea, Arctium Lappa) On Pathogenic Bacteria In Dog's Mouth**

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Dental caries is defined as a biotic multi-microbial disease caused by pathogens and caused primarily by the complex interaction of oral bacteria (cariogenic oral flora) with refined, fermentable dietary carbohydrates on the tooth surface over time. The aim of this study was to investigate the antibacterial, antifungal, and cytotoxicity characteristics of the extracts of *Zataria multiflora*, *Echinacea purpurea* and *Arctium Lappa* as a potential herbal formulation. The essential oil of *Zataria multiflora* leaves and the extracts of *Echinacea purpurea* and *Arctium lappa* roots were prepared. The characterization was carried out by GC-MS to determine the thymol and carvacrol of essential oil (EO) and also, total phenol and flavonoid were assayed for all three samples. The antimicrobial and anti-biofilm effects were evaluated against *S. mutans*, *S. mitis*, *S. salivarius*, *L. acidophilus*, *E. coli*, *S. aureus*, *C. albicans*. The cytotoxic effect of extracts and formulation was evaluated on HEK 293 and HDFa cells by MTT test. Thymol and carvacrol content in EO of *Zataria multiflora* were measured 31% and 42.2% respectively. The MIC values of *Zataria*, *Arctium*, and *Echinacea* against *S. mutans* were 0.011% v/v, 187.5 mg/ml, and 93.75 mg/ml, while MBC were 0.011% v/v, 375mg/ml, and 187.5 mg/ml, respectively. The formulation showed bactericidal activity against *S. mutans* in the concentration of 5.86 mg/ml for *Echinacea* and *Burdock* extracts and 0.08µl/ml for EO of *Zataria*. The formulation showed a significant effect against formation of microbial biofilm and induced biofilm degradation after its formation ( $p < 0.001$ ). The cell viability percentages were higher than 50% in the tested concentrations for all groups in the both cell lines during 24 and 48 h. The formulation of three herbal extracts had a significant antimicrobial effect on cariogenic bacteria and *C. albicans* with the lowest cytotoxic effects. Therefore, this formulation can be an appropriate candidate for mouthwash

**Keywords:** Antimicrobial, Cytotoxicity, *Zataria multiflora*, *Echinacea purpurea*, *Arctium lappa*

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## **The Inhibitory Effects Of Alcoholic Extract Of Iranian Citrullus Colocynthis (Sistan And Baluchestan Province) On Common Bacteria And Fungi In Oral Diseases And Dog's Dental**

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Dental caries is defined as a dysbiotic multimicrobial disease caused by pathobionts and caused primarily by the complex interaction of oral bacteria (cariogenic oral flora) with refined, fermentable dietary carbohydrates on the tooth surface over time. Given the effective compounds in this plant, it is attempted to evaluate the inhibitory effect of the alcoholic// extract of *Citrullus colocynthis* on bacteria and fungi common in oral diseases in laboratory conditions. The ethanol extract was obtained from the dried fruit of *Citrullus colocynthis* and the essential oil of dried fruit and fresh fruit of this plant was obtained via water distillation. After conducting phytochemical tests including determination of total phenolic and flavonoid compounds of the extracts, GC-MASS test as well as microbial tests of the extracts were conducted on *S. mutans*, *E. coli*, *S. salivarius*, *L. acidophilus*, *C. albicans*, and *S. aureus*, and MIC and MBC rates were obtained. DAD tests and the effect of ethanolic extract were also conducted to prevent the formation and degradation of biofilm of all microorganisms. The survival rate of HGF1-PI and HEK-293 cells was assessed by MTT assay. MIC value obtained for *S. mutans*, *S. salivarius*, and *L. acidophilus* was 1.56 mg/ml, and 3.12 MBC mg/ml. Moreover, *Citrullus colocynthis* also has an inhibitory effect on bacteria and *C. albicans* at these concentrations according to the DAD test. The survival rate of human viable cells at concentrations of 5 mg/ml and 10 mg/ml was less than 50% and at concentrations of 2.5 mg/ml and 1.25 mg/ml was less than 70% after 24 hours and 48 hours. In addition, the extract of this plant had a significantly lower effect against biofilm formation and biofilm degradation of the investigated microorganisms compared to the chlorhexidine group ( $P < 0.01$ ). The ethanolic extract of *Citrullus colocynthis* has inhibitory and lethal effects against pathogenic bacteria and fungi, but according to the results of cytotoxicity of this plant at concentrations



1.56 mg/ml and 3.125 mg/ml, using this plant as a mouthwash is not recommended to prevent caries and fungal infections of *Candida albicans*. It is recommended to evaluate the effect of the extract of *C. colocynthis* in pulpotomy treatments.

**Keywords:** *Citrullus colocynthis*, alcoholic extract, antibacterial, anti-fungal, anti-cavity.

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## Evaluation Of Proper Prescription And Use Of Antibiotics In Small Animal Dentistry

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Preventing infection and recognizing the conditions in which complicated infections following dentistry treatments are probable in spite of existence of no oral infection are so important. They can be prevented or the probability of their occurrence can be minimized by prescription of antibiotics. In this study, regarding the primary conditions of prescribing antibiotic in treatment procedure, field study was done in veterinary clinics of Tehran and Kerman cities. After analyzing the statistical data, the factors of proper selection of antibiotics, dosage, and treatment period were studied. In the following, it was tried to explain the goal of antibiotic prophylaxis, and the side effects that threaten





patients' health in the case of inobservance. The major uses of antibiotic are limited to treatment procedure (acute dentoalveolar cellulitis and abscess, pericoronite, osteolyelitis, etc.) and prevention procedure (post-surgical wound, general or topical weakness of immune system, etc.). Improper prescription of antibiotic can lead to digestive symptoms, more infection, drug resistance, drug interaction, etc. The problem with excessive use of antibiotics is that the physician will never find out that nothing would happen in the case of not prescribing. Improper and excessive prescription of antibiotic is common in oral surgeries and dentistry treatments. This method not only does not decrease the probability of infection, but also is wrong, non-scientific and harmful. Unfortunately, there is no certain strategy based on the evidences of antibiotic prescription in oral and dental patients especially in small animals, and prescription is usually done based on experience, cost, and the method used by the owners of animals, etc. Consider how antibiotics work. If the drug is in high enough concentration around the bacteria, the drug either prevents bacterial reproduction (bacteriostatic) or actually kills the bacteria (bacteriocidal). In order for this to happen, the drug must come into contact with the offending bacteria for a sufficiently long time.

**Keywords:** Antibiotic, Small Animal, Dentistry

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## **Evaluation Of The Effect Of Polyurethane And Zeolite And Hydroxyapatite Nanocomposites On Canine Dental Tissue**

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The aim of this study was to provide suitable nanocomposites with new applications and higher strength and greater compatibility with a higher success rate in treatment with longer durability along with accelerating the healing of damage to tooth tissue. This study was performed on 12 dogs and 2 and 3 premolars of the maxilla and the premolars 2, 3 and 4 of the mandible as follows. Dogs are in NPO condition before surgery. The dogs are first placed on a dental table and then, under aseptic conditions, atropine 1% at a dose of 0.04 mg / kg is injected subcutaneously into the animals to reduce discharge and saliva during surgery. Dogs are anesthetized with 1% aspromazine 0.02 mg / kg and 10% ketamine 10 mg / kg, and 5% halothane and isoflurane are used to administer anesthesia. Then the dogs in the teeth of anesthetized dogs because the amount of enamel is between 0.5 to 1.0 mm. We make a hole of 0.5 mm and then remove the debris with normal saline and then fill it with polyurethane with zeolite and hydroxyapatite. And harden it with UV light. Then we used ceftriaxon at 20 mg / kg and tramadol at 5 mg / kg to reduce pain and analgesia. After the surgery, the dogs are anesthetized 4 times every 15 days and then the treated teeth are extracted to make a layer of them with a microtome and also a radiological photo is taken from them. This is repeated on days 15, 30 and 45 after surgery. Then, in the tissue section of the tooth, we examined the amount of odonto-blasts and the amount of possible inflammatory cells in the presence, as well as bacteria, if any, and the amount of healing and tissue improvement during this period. As a result, nanocomposites are suitable options. Because they help us to increase the success rate of treatment with new applications and higher resistance and greater compatibility.

**Keywords:** Nanocomposite, Polyurethane, Dental, Zeolite, Hydroxyapatite

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## **Laparoscopic Normal Anatomy Of The Abdomen In Standing Positoin Female Donkey (Equus Acinus)**

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Laparoscopy is considered as a standard method for surgical techniques of abdominal exploration in standing position. Laparoscopic anatomy of healthy and live animal is different from anatomic structures of the cadaver and provided more accurate information for veterinary surgeons. In the present study five female healthy donkeys (*Equus assinus*) approximately 180-200 Kg weight and 5-10 years of age underwent laparoscopy in standing position. They were sedated with xylazine hydrochloride (1.1 mg/kg) and the local anesthesia was supplied using lidocain hydrochloride 2%. The insufflation was performed using 12 mmHg. The light source was inserted from another port, and anatomical features of left and right hemioabdomen were investigated. In the present study, tendinous part of diaphragm, lateral left, quadrate process of the liver, ligaments of liver, stomach, duodenum, spleen, gastro-splenic lig., diaphragmaticosplenic lig, nephron splenic lig., female reproductive tract, left and right dorsal colon and pelvic flexure of the colon were observed. The anatomical findings were more accurate and natural than those of the cadaver. The anatomical laparoscopy of the female donkeys ended up accurate information on normal position of the anatomic structures and peristaltic movements in the abdomen that would be helpful in surgical procedures of the abdomen in standing po-



sition. Furthermore, this study could help DVM students and DVSc candidates of surgery and anatomy to have more deep understanding of anatomic structures of the abdomen.

**Keywords:** Laparoscopy, laparoscopic anatomy, standing, female donkey

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## Hemivertebrae In The Thoracic Vertebrae In A 9-Month-Old Filly

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Developmental abnormalities of thoracic vertebrae are infrequent in horses. Hemivertebrae is a congenital spinal anomaly resulting from failure of formation on one side of a vertebral body. This condition can cause kyphosis, lordosis, or scoliosis with or without neurologic gait deficits. This report describes the clinical findings of congenital thoracic hemivertebrae in a filly. A nine-month old walking filly with a distinct mass over the back region was referred to the Veterinary Teaching Hospital of Ferdowsi University of Mashhad. According the owner, this mass was present since her birth and increased in size over time. There was no history of trauma. On physical examination the filly was alert and her body condition was normal. The respiratory rate, heart rate and temperature were within normal limits. Examination of the filly back revealed kyphoscoliosis over the thoracic vertebrae. No pain was detected on palpation. Mild ataxia and abnormal gait in hind-



limbs were observed on examination of the limbs. In plain radiographs of thoracic vertebrae, multiple hemivertebrae were seen in 13th-15th thoracic vertebrae and vertebral canal stenosis with malformations of the vertebral bodies of T12, T16 and T17. In myelographic evaluation under general anesthesia, ventral and dorsal aspect of contrast medium column was not passed that revealed extradural compression of the spinal cord in mentioned thoracic regions. Various aspects of this disorder including its progression, treatment options, outcomes, prognosis, and animal's welfare were fully explained to the owner, but the owner refused to its management. Thoracic vertebral malformations are an uncommon congenital disorder occurring in horses. Complete clinical examination and diagnostic imaging techniques are required to diagnosis of vertebral malformation.

**Keywords:** Hemivertebrae, thoracic vertebrae, horse.

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## **Biometric Evaluation Of Adult Arabian Horse Eyes By Ultrasonography**

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Ultrasonography is a non-invasive, safe and painless method that is used to study the structures inside and outside the cavities of the horse's eye and through which useful information is obtained. The aim of this study was to determine the exact biometric characteristics of the eyes



of purebred Iranian Arabian horses using ultrasonography. This study is a clinical study that was performed on 8 completely healthy horses adult horses, For this purpose, using ultrasonography (drumski) and linear water (frequency 8 MHz) and with the help of lighting modality, both eyes of the horse were examined and the size of their internal structures were determined. The results showed that the mean diameter of cornea, anterior chamber, lens length, lens width, posterior chamber, length of black body and width of black body of right eye of adult horses were equal to 1.50, 5.75, 6.88, respectively. 17.75, 16.38, 2.50 and 2.12 mm and in the left eye of adult horses are equal to 1.50, 6.25, 7.38, 17.38, 17.15, 2.62 and 2.50 mm. It was also found that although the mean of different parts of the right and left eyes are different from each other, but this difference is not statistically significant in any of the parameters ( $P \leq 0.05$ ). The results of this study can be used as a standard criterion for examining the eyes of Arabian.

**Keywords.** Ultrasonography, Arabian horses, eyes, biometrics, anatomy

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## **Diagnostic Imaging Findings Of A Femoral Fracture In A 20-Day-Old Foal**

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One of the most common causes of femoral diaphysis fracture in the foal is being kicked by other horses, especially the mother. Another cause of this fracture is falling from an organ with a history of injury



and trauma. Clinical signs of long bone fractures include high-grade of non-weight-bearing lameness with severe swelling of the surrounding soft tissues. Also, damage to the femoral or popliteal arteries may occur regional bleeding, causing hematoma and threatening the foal's life. The region's swelling can be seen from the lateral view. However, the complication shows itself well when we look at the foal from a caudal view and compare the appearance of hindlimbs on both sides. Complications related to the structure of the fracture and its importance in foals include problems related to the fracture and cause deformity, secondary infection, and fixation of the fractural fragments with surgery. Infection is directly associated with damaging soft tissues around the fracture, and whole effort should be made to manage the wound, stabilize the fracture, and minimize damage to the surrounding soft tissues. In addition, broad-spectrum systemic antimicrobial should be performed before and during surgery. Despite all these efforts, deformity in bone structure and tendons disorder may eventually lead to impaired bone growth and shortening of the limb. The presented foal, a 20-day-old mare, was referred to the Department of Radiology Faculty of the Veterinary Medicine University of Tehran with clinical signs of swelling in the right femoral region and non-weight-bearing lameness (grade 4). There was a kick by the mother in the box five days ago in history. In standard view of radiographs taken from right hindlimb, spiral and override fracture in the diaphyseal region of right femoral bone with a detachment of 2-3 small non-reducible bone fragments were detected. Also, The sharp borders of the fragments cause severe regional muscle rupture and, consequence, subcutaneous and intramuscular hemorrhage. In clinical observation, skin bruising and swelling were seen from the outside of the soft tissues of the region.

Keywords: Foal, spiral fracture, grade 4 lameness, digital radiography

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## Hoof Imbalance As The Negative Angle Of The Solar Border Of The Third Phalanx (Negative Palmar Angle) In A 13-Year-Old Jumping Horse

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The angle between the palmar surface of the third phalanx with the ground is normally between 2 and 7 degrees. If this angle changes and a negative angle is created, the condition is representative of negative palmar angle conformation. This condition is caused by the lack of soft tissue structures (especially the digital cushion) on the palmar section of the foot, which allows the distal phalanx to descend distally in the palmar section. These changes cause malalignment of third phalanx with second and first phalanxes and creates a broken back hoof condition, negative balance of third phalanx also increases the tension on the deep digital flexor tendon and this results in excessive pressure on the navicular bone and the navicular bursa. This condition can occur in either the forelimb or hind limb. A 13 year old jumping horse was clinically examined with a history of pain in right forelimb. Initial examination showed no signs of abscess formation in solar surface of hoof and also by doing a nerve block in hoof area, the animal's lameness has been eliminated. For further examination, radiographs were taken at standard views of the hoof, coffin and pastern joints of the limb. In the lateral radiographs, third phalanx imbalance as significant downward displacement of the palmar surface of the third phalanx along with symptoms of pedal osteitis was observed. The condition of the navicular bone was acceptable and radiographic signs of abscess in solar surface of hoof were not seen and there were also no chip fractures in the coffin and pastern joints. Excessively low palmar surface of the third phalanx due to pressure on DDFT and navicular bursa is a common cause of pain and lameness in the hoof area. The use of MRI in these cases can determine the extent of tendon and navicular bursa damage. Correction of hoof by horseshoeing and the use of corrective pads can help reduce clinical symptoms.





**Key words:** Horse, Lameness, Palmar angle, Tendon , Radiography

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## **Radiologic Evaluation Of Overextended Of Carpal Joint In Newborn Holstein Friesian Calf: A Case Report**

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Congenital malformations in farm animals depend on multi factors and some of these malformations distinguished by maternal deficiencies and other iatrogenic traumatic items. Skeletal deformities often differentiate by clinical exam and imaging methods. In newborn bull calf, the bilateral carpal joint overextension about 50 to 60 degrees is a really rare disorder that radiological evaluated. All of the carpal joint bones specified and the main cause of the deformity explained as carpal joint laxity. Both forelimbs supported by the fiberglass cast.

**Keywords:** calf, deformity, congenital, carpal joint, radiography

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## Determination Of Normal Mean Ejection Fraction Index By Echocardiography In *Oryctolagus Cuniculus*

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*Oryctolagus cuniculus* are an excellent model for cardiovascular research because the size of these animals is more suitable for study and experimentation than smaller animals and are economical and cost-effective in research. One of the most important diagnostic imaging techniques is echocardiography, which is used today to perform anatomical and functional evaluation of the cardiovascular system and is one of the most accurate and sensitive non-invasive methods for examining heart diseases. Ventricular function indices could be assessed by cardiac imaging techniques. One of these important cardiac parameters is the ejection fraction, which has a valuable position along with other involved parameters. Ejection fraction is a measure of blood percentage that comes out of the heart with each contraction. For this study, 100 six-month to one-year adult, standard and young *Oryctolagus Cuniculus* (in Iran) and in healthy appearance of both sexes (50 female rabbits and 50 male rabbits) were studied without anesthesia and sedation. In this study, the mean ejection fraction in the studied *Oryctolagus Cuniculus* was  $58.753 \pm 6.889$  in male animals and  $61.397 \pm 6.530$  in females which indicates that the ejection fraction in the assessed male population was significantly higher than the female population.

Conclusion: The measured ejection fraction values were comparable to those mentioned in the authoritative books and there is no significant difference in the average size of ejection fraction measured in this study with the previous research.

**Keywords:** Echocardiography, *Oryctolagus cuniculus*, Ejection fraction, Heart

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## Heart Biometry Of The Healthy Cane Corso By Echocardiography

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The aim of this study is assessing natural variations of heart of healthy immature Cane Corso. For this reason, 6 Cane Corso (6-10 months old) with healthy heart that were admitted to a Taghipour veterinary hospital for checkup. Echocardiographic images were obtained in Right parasternal short and long axis views. The results of these studies showed that means and standard deviations of the Cardiac parameters including Aortic root ( $1.86 \pm 0.2$  cm), Left Atrium ( $2.39 \pm 0.51$  cm), Right Atrium ( $3.50 \pm 0.32$  cm), intraventricular septum during diastole ( $0.84 \pm 0.11$  cm), Left ventricle during diastole ( $4.52 \pm 0.25$  cm), left ventricular wall during diastole ( $0.84 \pm 0.16$  cm), intraventricular septum during systole ( $1.45 \pm 0.34$  cm), Left ventricle during systole ( $2.29 \pm 0.13$  cm) and Left ventricular wall during systole ( $1.78 \pm 0.29$  cm). From these findings, it can be concluded that by having the dimensions of different parameters, it is possible to study the heart diseases of Cane Corso dogs relatively accurately and take preventive measures based on them.



**Keywords:** Anatomy, Heart, Biometry, Cane Corso, Echocardiography

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**The Co-Occurrence Of Unilateral Ectrodactyly And Syndactyly In A Shorthair Cat Indigenous To Tehran: A Case Study**

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Syndactyly refers to a condition in which two or more toes are fused together. Ectrodactyly is a condition represented by the absence or malformation of one or more of the toes. Both complications are congenital and are reported only in a few cats. Our case was a non-sterile shorthair cat indigenous to Tehran that was referred to Dr. Taghipour Veterinary Hospital due to lameness in the anterior motor limb from birth. Pain and malformation in the left toes (lack of space between to lateral digits, digits malformation, low number of digits) were detected in orthopedic examinations. The radiographs indicated the absence of V digit, and complete fusion was observed in the metacarpus and the joints of digits III and IV. Malformations in the carpal bones (particu-



larly in the accessory bone) and the joint of digit II were also detected in the radiographs. However, this complication was absent in the mother of this cat. The reported evidence suggests that the congenital malformations of limbs, especially ectrodactyly and syndactyly, are rarely seen in animals, in particular cats. In Iran, no report is available on the occurrence of such disorder in cats. Therefore, this is the first observation of ectrodactyly and syndactyly disorders in Iran.

**Keywords:** Congenital complication, syndactyly, ectrodactyly, cat

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## **Comparative Evaluation Of Relative Heart Size In Male And Female Dogs By Radiography**

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The heart is one of the main and important organs of the body and it is necessary to know its exact size. Chest radiography is one of the most important ways to identify this vital organ. This method is a relatively accurate tool for measuring the size of the heart, especially when echocardiography is not possible. The aim of this study was to evaluate the relative size of the heart with two criteria, namely the maximum width of the heart relative to the width of the thoracic cavity (CTR) and the maximum size of the heart relative to the sixth thoracic vertebra (CT6R) (as a new criterion) in dogs using radiography. The animal studied in this study was 30 healthy dogs that were referred to Dr. Taghipour Veterinary Hospital. The condition for admission of these



dogs was the absence of abnormal heart sound in cardiac hearing and no clinical signs of heart disease. Radiographs were taken from all animals in the ventral-dorsal view (VD view) at the time of expiration. Then the maximum width of the heart, the width of the chest at the site of the maximum size of the heart and the width of the sixth thoracic vertebra (T6) were measured. The results were evaluated using statistical tests. The results of this study showed that first: the mean and standard deviation of CTR in the whole population, female and male dogs were  $0.58 \pm 0.11$ ,  $0.57 \pm 0.15$  and  $0.58 \pm 0.05$ , respectively. Second: The mean and standard deviation of CT6R in the whole population, female dogs and male dogs are  $4.99 \pm 0.69$ ,  $5.04 \pm 0.68$  and  $4.93 \pm 0.72$ , respectively. Third: There is no statistically significant correlation between CTR and CT6R in female dogs ( $P=0.34$ ), Fourth: There is a statistically significant correlation between CTR and CT6R in male dogs ( $P=0.05$ ), Fifth: There was no statistically significant difference between CTR in female dogs and male dogs ( $P=0.33$ ). Sixth: There is no statistically significant difference between CT6R in male and female populations ( $P=0.59$ ). Conclusion. The CT6R criterion can be used as a new and useful indicator to determine the size of the heart in dogs, but studies with a larger community are recommended for closer examination. Gender also has no effect on heart size.

**key words.** Radiography, relative heart size, chest width, vertebrae

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## **A Comparative Study Of Dog Renal Size In Males And Females By Radiography**

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The kidneys had a large and varied role in the normal functioning of the body, so it is important to try to diagnose and identify various kidney diseases, as well as follow-up and treatment of those diseases. For this purpose, accurate knowledge of the size of the kidneys and their differences between males and females seems necessary. Therefore, this study was performed to accurately measure the kidneys of males and females and compare them with each other. method. In this study, among adult, sterile and healthy dogs (clinically, blood cell and blood biochemistry) referred to Dr. Taghipour Veterinary Hospital, 8 females and 8 males were randomly selected. The length of the left kidney (LK) and right kidney (RK) as well as the length of the second lumbar vertebra (L2) were then measured in the ventral-dorsal view of their radiographic images. Then, using t-test and at the error level of 0.05, the difference between the measured values between males and females was compared. Results. The results of this study showed that first: the mean and standard deviation of LK, RK, LK/L2 and RK/L2 in females were  $4.30 \pm 0.61$  cm and  $4.45 \pm 0.60$  cm, respectively. It is  $2.79 \pm 0.28$  and  $2.89 \pm 0.27$ . Second: Mean and standard deviation of LK, RK, LK / L2 and RK / L2 in males  $5.23 \pm 0.94$  cm,  $5.29 \pm 0.95$  cm,  $2.87 \pm 0.26$  and,  $2/28 \pm 90/2$ . Third: LK and RK in males are larger than females and this difference is statistically significant. However, the difference between the two and L2 was not statistically significant. According to the obtained data, it can be concluded that all males are significantly larger than all females.

**key words.** Dog, kidney, radiograph, male, female

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graphic kidney size in Miniature Schnauzer dogs. J. Vet. Med. Sci. 2016;16-0003.

## Case Report Of Craniomandibular Osteopathy In A Immature Mixed Breed Dog

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CMO, also known as “Lion jaw” is a proliferative bone disease occurs mainly in young immature dogs usually between 3-8 months. Affected dogs have mandibular swelling, pain on opening the mouth or jaw lock, difficulty or inability with mastication, pyrexia or combination. CMO is a self-limiting disease with unknown etiology, bony proliferation generally ceases with skeletal maturation. Rarely concurrent metaphyseal long bone changes similar to hypertrophic osteodystrophy have been seen in dogs with CMO. A 8 month old large mixed breed dog was referred to Tehran-azma veterinary diagnostic center, The patient had poor body condition, jaw lock and mandibular swelling, there is also swelling around the left carpus region. DV, lateral and lateral oblique radiography of the skull and orthogonal views of the left forelimb has been taken.

Bilateral asymmetrical irregular new bone formations noted around and specifically in the ventral aspect of the mandibles, TMJs and the petrous temporal bone. Chronic irregular palisade periosteal productive response surrounds the distal metaphyses of the left radius and ulna was also noted. The physes was relatively unaffected. Diagnosis of craniomandibular osteopathy associated with concurrent chronic phase of the hypertrophic osteodystrophy in the left forelimb has been made based on signalments and radiographic signs, however, bone biopsy can also provide additional information in non-terrier breeds. CMO is a self-limiting disease and proliferation ceases with bone maturation, anti-inflammatory drugs and supportive IV serum therapy is the first step of treatment, further steps are depend on the involvement of the TMJs on the CT-Scan.

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## **Case Report Of Diagnosis Of An Abdominal Gossypiboma In A Spitz Dog Using Radiography And Ultrasonography**

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Gossypiboma usually referred to any mistakenly remained object inside the patient's body during surgical procedures. The most common complication of the gossypiboma is surrounding adhesion tissue and pain. A 2 years old female spitz breed dog were referred to Tehran-Azma diagnostic center with chief complain of caudal abdominal pain. The patient has good appetite and normal body condition although uncomfortable in palpation of the caudal abdomen. The patient has been neutered a year ago after internal fixation of the ilium fracture caused by car accident. VD and lateral radiography of the abdomen has been made. An oval shape, well-defined, soft tissue opacity mass like structure noted in the caudal abdominal region cranial and slightly to the right side of the urinary bladder. Following the radiography, for more investigation of the nature of this mass-like structure, abdominal sonography has been performed. The structure has a thin layer of tissue on the surface and distal shadow, some linear architecture appeared after increasing the brightness and gain. No parenchymal vascularization noted in the doppler exam although the surface tissue has shown mild blood supply. Based on the radiographic and sonographic appearance of the lesion, gossypiboma diagnosis made for this patient and the patient has been referred for exploratory laparotomy. The mass like structure were adhered to the adjacent organs by surrounding fibrotic tissue and the center of the mass were a remained sterile tampon. Gossypiboma usually resulted form sterile surgical tools and therefore secondary infection is unlikely if the remaining object is unsharp, however, adhesion to adjacent organs may cause pain or secondary complications if the gossypiboma located near the vital organs, vessels or nerves.

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## Empty Sella Syndrome In A Mix-Terrier Dog, A Case Report

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A three-year-old Mix breed terrier female neutered dog with 2 months history of depression, uncoordination and collapse with exercise, was referred with perior hypoadrenocorticism suggestive by ACTH stimulation test in addition to elevation of the serum alkaline phosphatase and cholesterol level and hyponatremia and decreased urinary specific gravity. Ultrasonographic examination of the abdominal cavity revealed bilateral small adrenal glands with normal echogenicity and echotexture. Based on the neurologic signs skull Magnetic Resonance Imaging performed. In MRI the pituitary fossa was fluid empty and was filled with a well-defined homogeneous fluid like signal intensity communicated with the third ventricle by way of the infundibular recess. Based on the imaging and the history, hypophyseal dysplasia corresponded to and empty sella syndrome was diagnosed. Empty sella syndrome is characterized by an intrasellar herniation of the suprasellar subarachnoid space which results in a flattening of the pituitary gland. This is either due to the gland hypoplasia/aplasia and ex-vacuum extension of the third ventricle into the sella turcica or due to herniation the ventricle related to an underlying obstructive ventriculomegaly. Patients with the mentioned syndrome may present abnormal endocrine functions but also can be not clinically relevant.

In our knowledge there are few reports of associated of empty sella syndrome with hypoadrenocorticism.

**Keywords:** Empty sella syndrome, hypoadrenocorticism, MRI, Dog

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## **Volumetric Determination Of The Spleen By Computed Tomography Comparing With Orthogonal Abdominal Radiographic In Dogs**

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Many studies have shown that computed tomography (CT) and radiography are useful diagnostic imaging techniques for the abdominal organ volume estimation in the dog; however, the CT measurements supposed to be more accurate based on its three dimensional imaging nature. Spleen size estimation on radiographs is always challenging due to its very mobile orientation and displacement. The aim of this study was to evaluate the volume of the spleen by the means of CT scan images and compare it to the orthogonal radiographic images to obtain a possible association between spleen size in these two methods. A total of 15 healthy adult dogs were included and underwent CT scanning and standard abdominal radiographic examination under general anesthesia, almost at the same time. Data was evaluated by Pierson test using SPSS version 17.

Based on our results, there was no significant differences between the measured values of spleen in radiography and the CT volumetric data ( $P > 0/05$ ): however, significant correlation was observed between the



splenic area in the ventrodorsal radiographic view the CT measured volume ( $P > 0/184$ ) which can be considered better radiographic positioning compared to the left and right lateral and dorsoventral radiographs. Despite small sample size, it is the first prospective study to assess the accuracy of the radiographic positionings on volume estimation of the spleen.

**Key words:** Spleen, Radiograph, CT scan, Dog

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## **Rare Case Report Of Osteochondroma In The Nasal Cavity Of A Terrier Mix Dog**

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Osteochondromas are a relatively common imaging finding, accounting for 10-15% of all bone tumors and approximately 35% of all benign bone tumors. Although usually thought of as benign bone tumor they may be thought of as a developmental anomaly. They are frequently asymptomatic and have very low malignant potential if sporadic and solitary. An 8-year-old male Terrier Mix dog with clinical signs of difficult breathing and coughing referred to the Small Animal Hospital of Tehran University and CT scan of the varicose skull was performed at the request of the veterinarian. A CT scan showed a large, round, smooth-edged, slightly lobulated, mineral-dense, protruding mass at the junction between the right parietal bone and the forehead. It was



a heterogeneous and punctuated mass that was drawn into the right calvary and compressed the parietal lobe and the right forehead of the brain. Evidence of cerebral edema and slight displacement to the left of the fox brain was also seen. After that, the surgical section of the mass was removed and sent to the pathology laboratory. The laboratory results of the mass showed the presence of biphasic growths comprising a cap of hyaline cartilage and a base of endochondral ossification. The intertrabecular spaces typically were contained loose fibrous connective tissue. The cap were discontinuous and cartilage columns less obvious. Islands of cartilage were retained in cancellous bone within the base of the lesion. Continued proliferation of chondrocytes in the cartilage cap were seen. Histopathologically, endochondral ossification was also observed beneath a superficial cap of hyaline cartilage. There have been no reports of osteochondroma in dogs' Nasal cavity, and only a few cases have been reported in dog's trachea and two in horse's nasal cavity. One of which is a study revealed the presence of osteochondroma of the P1 in 6 Tbourida horses in 2019 and another one was about a 3 years old Appaloosa stallion with a 4 cm x 4 cm x 2.5 cm mass protruding from his nasal bone in 1993. Since research has shown that this type of tumor is benign and no metastasis was observed, in this case, the removal of this mass by the time of writing had solved the animal's problem.

**Key words:** Osteochondroma, Nasal cavity, Dog

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## Ultrasonographic Assesment Of The Effect Of Hydroalcoholic Extracts Of Echinacea Purpurea On Achilles Tendon Healing In Rabbit

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This study has been conducted to research and assesses the effects of hydroalcoholic extracts of Echinacea purpureae on Achilles tendon healing in a rabbit model using an ultra-sonographic method. To pursue this objective 10 healthy New Zealand male rabbits were selected. The rabbits were divided into two groups of experimental and the control group the mean age of the control and treatment group was  $13/90 \pm 3/32$  month also the mean weight of control and treatment was  $1/70 \pm 0/26$  kg. The experimental group received Echinacea extract at the dosage of 400milligrams per kilogram body weight orally, each day for a total of 8 weeks. Ultrasonography was performed with a linear transducer 12 MHZ Frequency. Measurements of Achilles tendon dimensions such as thickness, width and cross- sectional area were done both sagittal and transverse view. Every two weeks both of these groups were submitted to ultrasonography of the operated tendon and in each of these procedures, the diameters of the tendon were measured. Results of this study showed that significant differences was found between the amounts of thickness and cross-sectional area of tendon between 8 weeks after administration of extract and before receiving the drug in treatment group. There was no significant changes in the control group. The results confirmed that using Echinacea purpureae in treating the wounded tendon will have some benefit and can reduce the inflammatory phase duo to its anti-inflammatory compounds.

**Keywords:** Rabbit, Achille, Tendon, Echinacea purpurea, Ultrasonography

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## **Radiographic Measurements Of Some Parameters Related To Hip Dysplasia In Clinically Normal Iranian Mixed Breed Dogs**

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Hip dysplasia (HD) is an inherited ,non-congenital disease that is particularly prevalent in large and giant breeds of dogs. Many of the dogs involved with HD, show no clinical signs, and the disease gradually causes the dogs to become weak. The aim of this experimental study is Radiographic measurements of some parameters related to hip dysplasia in Iranian mixed breed dogs. 10 Iranian mixed breed male dogs with the mean age of  $5.33 \pm 1.65$  years and weight  $22.16 \pm 5.5$  , after clinical examination and ortolani test for HD, using standard ventrodorsal hip extended view in both hip joints( Left and right) were evaluated using the FCI rating system. The Penn HIP method was also used to measure DI. The Mean $\pm$  SD of Norberg angle on the left & right coxofemoral joint was  $108.11 \pm 1.26$  degree and  $110.66 \pm 5.78$  degree respectively. Also, the mean $\pm$  SD of PC on the left & right coxofemoral joint was  $60.66 \pm 12.38\%$  and  $66.77 \pm 11.43\%$  respectively. The Mean $\pm$  SD of DI on the left & right coxofemoral joint was  $29.44 \pm 12.5\%$  and  $30.33 \pm 11.53\%$  respectively. Results showed that there was no significant differences between left and right hip joints ( $P \geq 0.05$ ). The results obtained in this study can be applied as a template in recognition and



treatment of hip dysplasia in Iranian mixed breed male dogs.

**Keywords:** Dog, Radiology, hip dysplasia, FCI

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## **An Ocular Tvt In An Iranian Native Dog, A Case Report**

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The case, a five-year-old intact male Iranian native dog, was referred to Peyman Pet Hospital with symptoms of ocular disease in the right eye. Clinical examination revealed the presence of reddish lesions originating from the conjunctiva of the upper and lower eyelids of the right eye and overlaying the Orbit and swelling of the prepuce. Routine hematologic studies did not reveal any abnormalities. Radiographic examination of skull showed an irregular well-defined soft tissue mass like lesion without signs of bone involvement in mentioned eye. Ocular ultrasonography was also performed and showed a large, heterogeneous mass with mild sign of blood supply in cranial aspect of right eye which compresses and deviates all internal ocular structures including





anterior chamber and obliterates the posterior chamber. The lens which was displaced markedly axially, was decreased in size associated with thickened capsules and internal echoes. Signs of retinal detachments was also evident. For definitive diagnosis, fine needle aspiration was done and reddish yellowish fluid was aspirated and sent to the laboratory. Cytological results showed numerous round cells with round concentric nuclei. All of the findings above, were compatible with diagnosis of transmissible venereal tumor (TVT). Enucleation of the right eye was performed by surgery because of extensive intraocular damage and then the mass was sent for histopathologic examination. After the surgery two weeks of antibiotic therapy was prescribed and after the confirmation of TVT from histopathologic examination, five sessions of chemotherapy with vincristine sulfate at a dose of 0/025 mg/kg was performed weekly. After the last session of chemotherapy, the case had no sign of the disease in clinical examination and para-clinical tests. Canine transmissible venereal tumor (TVT) is a sexually transmitted neoplasm that frequently affects dogs of either sex, distributed globally. The disease is transmitted between dogs by contact with mucous membranes usually of the genitalia. Tumor cell inoculation is also possible in extragenital primary sites such as the nasal and oral cavities, rectum, skin and ocular membranes (conjunctiva) via licking or sniffing of the vaginal and/or preputial discharge.

**Key words:** Ocular, Transmissible venereal tumor (TVT). Ultrasonography, Histopathology, Chemotherapy, Dog

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## **Tympanic Bullae Hypoplasia And Otitis Media In 6-Month Old German Shepherd Dog**

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There is little published information about anatomic variation and morphology of tympanic bulla in mesaticephalic dogs and subsequent abnormalities including middle ear effusion which is known to be one of the most common causes of peripheral vestibular signs in dogs and cats. Although such malformation and variation is described as brachycephalic phenotypic features. This study aims to represent radiographical and CT scan features of unilateral tympanic bulla hypoplasia and concurrent middle ear effusion in six-month old German shepherd dog with clinical signs of right sided head tilt, deviation of the neck to right side and ataxia (right sided peripheral vestibular sign) for two months. In conventional radiography, borders of right tympanic bulla were indistinct with increased opacity of right middle ear and small tympanic cavity. CT scan examination confirmed malformation of right tympanic bulla, lower height of right tympanic cavity (1.33 cm) compared to the left one (1.93 cm) lower total volume of right tympanic bulla (24%), soft tissue attenuation material in right tympanic bulla and confirms right sided otitis media. After confirming right sided otitis media patient relieved from the vestibular signs by long term treatment for two months. Due to complex anatomical structure of middle ear, thorough evaluation of middle ear in conventional radiograph is impossible and CT scan examination provide further information by cross sectional imaging about subtle changes in anatomical morphology or pathology of the otitis media. It has been proposed that malformation of middle



ear, smaller tympanic cavity with narrower pathway of auditory canal and increased mucosal swelling impairs tympanic bulla drainage and should be considered as predisposing factor for prevalence of otitis media in young patients. Further investigations such as MRI, histopathological examination of epithelial and bony samples from affected tympanic bulla is required for considering definite relation between congenital malformation of tympanic bulla and middle ear infection.

**Keywords:** Hypoplasia, Tympanic bola, Middle ear inflammation, CT scan, Radiography

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## **A case report of subcutaneous hemangiosarcoma with invasion to the Abdominal wall in a Doberman dog**

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Hemangiosarcoma as an invasive and malignant tumor that originates from endothelial tissue and can occur anywhere in the vascular bed



but often primarily affects the spleen and occurs in both male and female dogs and cats. Among its variants, cutaneous and subcutaneous hemangiomas are very rare and usually occur over time. The most common places for occurrence is the skin of head and face and the possibility of its occurrence in the chest and abdominal wall is very rare. It affects most large breeds such as German and Golden Retriever and should be differentiated from fibrosarcoma tumors. A 7-year-old neutered Doberman dog with clinical signs of progressive weight loss, anorexia, immobility and history of previous cured TVT tumor was referred to Department of radiology, Faculty of veterinary medicine, university of Tehran and based on the patient's symptoms ultrasound evaluation from the abdominal region was requested. Ultrasonic examination showed any abnormality in the visceral organs just the distinction between cortex and medulla of both kidneys were reduced, which could be due to degenerative changes or chronic renal disorders. Also there was solitary subcutaneous hypoechoic lesion without detectable blood flow in the color Doppler signal beneath the right abdominal wall in caudal aspect of the 13th rib, which invaded the abdominal wall through skin defect but did not involve the visceral. To confirm the neoplasm and its type, sampling (FNA) was performed on the target lesion. After sampling and performing histopathological studies, the presence of mesenchymal mass of hemangiosarcoma in the subcutaneous tissue of the abdominal wall was confirmed. The neoplastic cells were oval to round with granular cytoplasm and vesicular nucleus and exhibited moderate cellular and nuclear pleomorphism. surgical process to remove of the mass from the abdominal wall were recommended to the patient's owner.

**Keywords:** Mesenchymal tumor, abdominal wall defect, Hemangiosarcoma, Ultrasonic examination, FNA

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## **Nutritional Management And Treatment Of A Case With Portosystemic Shunt In An 8-Month-Old Jack Russell Dog**

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A network of blood vessels that contains nutrients, hormones, and wastes carries blood out of the gastrointestinal tract and into the liver. The liver receives what it needs from the blood to function properly and detoxifies it before distributing it to the general circulatory system. The shunt is a communication channel between two structures that are not usually interconnected. The portosystemic shunt is specifically an abnormal blood vessel that connects the portal system to the systemic circulatory system and thus bypasses the liver. Liver shunts are divided into congenital and acquired. This study assesses an 8-month-old male Jack Russell dog who was referred to the private sector with symptoms of insomnia, severe vomiting, weight loss, and increased recovery time after anesthesia. After clinical examinations, hematology tests and biochemical profile evaluation were performed. Liver enzymes, including ALT, AST, and ALP, were higher than normal. On suspicion of liver complication, an ultrasound was performed. The appearance of the liver was normal and without changes in echogenicity with sharp edges, distinct and without space changes. According to the ultrasound results, no pathological changes were observed in liver tissue. Since the contrast-enhanced CT scan is the best method for assessing health problems, the patient was referred to the radiology department of the Small Animal Hospital of the University of Tehran. After intravenous injection of the contrast agent iodixanol, a CT scan was performed, which showed the following: The caudal vena cava was mildly dilated, and the shunting vessel extended ventrally, leftward, and caudally along the lesser curvature of the stomach and inserted to CVC at the



level of T13-L1 vertebrae with the size of 1\*0.43 cm. The splenic vein was also inserted on the shunting vessel at the level of T13 vertebrae. The definitive diagnosis was an extrahepatic portosystemic shunt as right gastric caval. The patient underwent surgery, and the shunt was closed. For the treatment of portosystemic shunts, surgical and supportive actions along with diet management are effective. Accordingly, following the treatment process, dietary modification and lactulose syrup were prescribed to reduce the protein intake, Livergel tablets were used as antioxidants, and serum therapy was performed. The patient's clinical symptoms improved with the mentioned treatment measures, and the liver enzymes returned to the normal range.

**Keywords:** Liver, right gastric caval shunt, dog

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## **Diagnosis Of Colonic Volvulus By Radiograph Of Contrast Agent In Cat**

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A 1.5-year-old neutered male DLH cat with a history of abdominal pain and intermittent vomiting for two days was referred. In the clinical examination, the body temperature was normal and the possibility of a foreign body in the gastrointestinal tract was given. A blood sample was taken from the patient for further examination, but no abnormalities were found. Due to suspicion of a foreign body in the gastrointestinal tract, radiograph was taken from the abdomen, but the foreign body was not observed. Then, ultrasound of the patient's abdomen was performed in order to examine the gastrointestinal tract and pancreas. No signs of peritoneal effusion, intestinal inflammation, pancreatitis, intestinal intussusception or plication were observed. For this reason, the patient underwent serial radiography with barium sulfate contrast agent from the gastrointestinal tract at 0, 4 and 16 hours, which finally remained in the colon after 16 hours. The radiographic appearance of the helical shape of descending colon indicated volvulus in that region. Then he was referred to the surgical ward to perform the necessary measures and using the method of colopexy to the abdominal wall, the volvulus was corrected.

**Key words:** Radiography, Colon, Volvulus, cat, Colopexy, contrast agent

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## Diagnosis Of Hydrocephalus Fetus Using Screening Ultrasound In Dog

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A two-year-old female terrier dog was referred to a veterinary clinic for an examination. On clinical examination, no special abnormal clinical sign was detectable and according to the owner history, the female terrier dog was pregnant due to mating with a Spitz male dog. To confirm the pregnancy and evaluate the health status of the fetuses, the female dog was undergoing abdominal ultrasonography. Using screening ultrasound and measuring fetal bi parietal diameter, abnormal dilation of the lateral ventricles of one fetus's brain with anechoic fluid and consequence an unusual increase in BPD was seen. The findings indicated that only one of the fetuses was suffered from hydrocephalus. Monitoring of the mother and fetuses by weekly screening ultrasound was recommended to the owner in order to check the fetuses' viability and mother health; however, the owner refused and finally the aforementioned fetus was died. Due to the fact that the diagnosis of any congenital disorder, including hydrocephalus in the fetus can be a ref-





erence to stimulate the abortion process or eventually dystocia. The results show that ultrasound is effective and important in diagnosing mother pregnancy status, age and fetal viability. Ultrasound also helps determine the survival rate and vital signs of the fetus.

**Keywords:** hydrocephalus fetus, Screening ultrasound, dystocia, dog, pregnancy

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## **Case Report Of Peritoneal-Pericardial Diaphragmatic Hernia (Ppdh) In A 7-Year-Old Male Boxer Dog**

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The diaphragm is a muscular structure that separates the abdominal cavity from the chest. Rupture of this muscle can lead to a diaphragmatic hernia. One of its most common forms is the peritoneal-pericardial hernia (PPDH), which occurs congenitally due to incomplete diaphragmatic growth. Most commonly reported in Weimaraner dogs, Cocker Spinel, and Himalayan cats. This complication is caused by an abnormal connection between the pericardial cavity and the peritoneum and eventually the displacement of the abdominal organs (liver, gallbladder, small intestine, stomach, and spleen) into the pericardium



Depending on the pressure caused by the presence of the abdominal viscera in the chest, the complication can be associated with or without clinical symptoms. The disease in dogs is often not associated with clinical symptoms and is recognized as an accidental finding during clinical examination and imaging. A 7-year-old male sterilized boxer dog with clinical signs of anorexia, difficulty breathing, especially during stress and physical activity (abdominal breathing), weight loss, and hearing of heart and lung muffle sounds during the clinical examination; was referred to the radiology department of the University of Tehran Veterinary Hospital for CT scan of the chest area. CT scan of the patient's chest, gallbladder and left middle lobe of the liver and Falsiform ligament were observed in the pericardial sac. Based on the symptoms and radiological findings, the decision was made to operate on it. The surgical procedure was performed by entering the abdominal cavity along the midline of the abdomen (midline abdominal celiotomy), and the organs inserted into the chest were placed in their normal anatomical position. To ensure that the viscera did not return to the pericardial cavity after two weeks of surgery, the patient underwent ultrasound and the patient's recovery after surgery was confirmed. Based on this, the surgical prognosis in dogs with PPDH can be from conservative to good.

**Keywords:** PPDH, congenital, CT scan, difficulty breathing, dog

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## **Diagnostic Findings Of Ct Images In A Male Lion With Thoracic Vertebral Fracture**

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The spinal column is a unique skeletal nervous system that due to pressure and trauma subject to sever damage, fractures and dislocations. One of the most important complications is that the fractures in the spinal column can cause damage to the nervous system and depending on the affected region, different clinical signs would be created. The distance between the tenth thoracic vertebra and the second lumbar vertebra is the most location that confront to fracture. One of the best way to diagnose spinal column injuries is CT scan. Treatment of these injuries, whether surgically or non-surgically, depends on bone damage grade and the region of nerve involvement. However recently, less invasive treatment methods have received more attention. 3-year-old immature male lion with history of poor nutrition and maintenance and without history of trauma, with clinical signs of falling while rotating and also suddenly lifting the hindlimbs was referred from the Eram Park Wildlife Complex to Division of Radiology, Faculty of Veterinary Medicine, University of Tehran for CT scan examination of thoracolumbar region. For anesthesia, Ketamin and Medetomidine were used. CT images of the case were observed and an old fracture was seen on right dorsal aspect of caudal endplate of the thirteenth thoracic vertebra. The bone fragment was caused 40% occupation of spinal cord cavity. Other findings observed in the thoracic vertebrae, were remodeling lesions in caudal endplate of 2nd thoracic vertebra and cranial endplate of the tenth thoracic vertebra which probably were as a result of repetitive stress or trauma. Also there was a mild generally decrease density in the skeletal system bones (MBD). In this report of male lion, all CT



images would be described and discussed.

Keywords: Vertebral fracture, MBD, CT scan, Male lion

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## **Report Of Hippocampal Atrophy In A Mixed Terrier Dog By Magnetic Resonance Imaging Technique**

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A three-week-old mixed-breed puppy with a four-week history of epileptic seizures, ataxia, anorexia, and vomiting that did not respond to routine treatment was referred to a vet medical center. Magnetic resonance imaging (MRI) of the animal's skull was performed to determine the cause of the seizure. MRI results showed asymmetric dilatation of the lateral ventricles of the brain as well as normal size of the third and fourth ventricles. The right lateral ventricle was connected to the subarachnoid space through a CSF-filled cavitory lesion in right dorsolateral aspect. The hippocampus was bilaterally small and symmetrical. The septum pellucidum was not visible between the lateral ventricles. Based on MRI observations, the final diagnosis of developmental porencephaly and bilateral symmetrical hippocampal atrophy was confirmed. Porencephaly is a congenital brain defect and a rare abnormality that has been reported in few veterinary cases. Concurrent findings of porencephaly with unilateral or bilateral hippocampal at-



rophy due to seizure symptoms have been reported in humans. In this case, the study also showed an association between porencephaly and bilateral hippocampal atrophy and severity of seizure symptoms. Hippocampus is a complex brain structure embedded deep into temporal lobe. It has a major role in learning and memory. Hippocampal atrophy, which is recognized commonly as a key role in Alzheimer and epilepsy in human, is controversial in canine epilepsy. It seems that seizure symptoms due to hippocampal atrophy occur in canine but less than human. The patient was re-evaluated by MRI after 6 months to assess the condition of the brain. The asymmetric and gentle enlargement of the lateral ventricles was still visible and did not change in terms of signal volume and intensity. The connection of the subarachnoid space to the right lateral ventricle was still visible. The hippocampus did not change in size compared to the previous study and was symmetrically small. The septum pellucidum was still not visible and the connection between the lateral ventricles was unchanged.

Key words: dog, MRI, hippocampus, porencephaly, seizure

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## **Radiological Features And Surgery Of Penetrating Intramural Gastric Foreign Body In A Persian Cat**

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Gastrointestinal foreign bodies are a common clinical problem encountered in surgical emergencies of small animal medicine. Patients with GIT foreign bodies can present with a variety of non-specific clinical signs including vomiting, anorexia, abdominal pain and weight loss. Penetration of gastrointestinal layering by foreign bodies occur almost when sharp ingesta has been swallowed. The situation can be more complicated by perforation of GIT and septic peritonitis. A 2.5-year-old Persian cat with clinical sign of intermittent vomiting, anorexia, weight loss and depression for several month was referred to the radiology department of veterinary hospital of university of Tehran, Iran. In ultrasonographic examination, the pyloric region was thickened and created a bull eye like appearance with a central hyperechoic and hypoechoic rim. The lesion continuous into the gastric lumen. Linear hyperechoic lesions with distal acoustic shadowing representing penetrating intramural foreign bodies was presented in the ventral aspect of the pyloric mass. The rest of the gastric lumen was filled with corpuscular food material. CT scan examination revealed increase thickness of pylorus and proximal duodenum (~1 cm) associated with post contrast enhancement of mucosal layer as well as presence of three penetrating linear foreign bodies (more likely sharp bony ingesta) in ventral wall of pylorus and subsequent severe chronic gastritis and proximal duodenitis. No sign of complete pylorus perforation and peritoneal free fluid was noted. Following the CT scan results, surgery was recommended. Gastrojejunal anastomosis was planned for surgical treatment due to extension of the lesion and to preserve pancreatic and biliary ducts flow. During surgery an anastomosis by enterotomy and gastrotomy was created between body of stomach and jejunum to make a bypass from



pylorus to small bowel. In 2 month follow up after surgery, hypomotility of small intestinal loops as a common consequence of gastrojejunal anastomosis were detected by contrast radiography and no other significant GIT problems were seen.

Key words: Gastrointestinal, foreign body, CT scan examination, gastrojejunal anastomosis, Persian cat, radiography

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## **Evaluation Of The Accuracy Of Radiography And Ultrasonography In Nasal Bone Disorders In Dogs**

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Nasal fracture is one of the most important disorders as a result of trauma in small animals. Clinical examination is the main method of diagnosis of nasal bone fracture. The aim of this study was to evaluate diagnostic accuracy of nasal diagnostic imaging (ultrasound and



radiography) in dogs suspected of traumatic nasal bone disorders and its relationship with clinical and surgical findings. This study was performed on 20 large breed dogs including 14 males and six females with nasal disorders and suspected cases of nasal bone fracture. The results of clinical examination, ultrasound and radiography were recorded and compared with the findings during surgery. Study data were statistically analyzed with chi-squared test and using SPSS 25 and Excel 2016 softwares. Evaluation of these dogs and their ultrasound showed that the accuracy and sensitivity of ultrasound in diagnosing fractures of bridge and lateral wall of the nose are higher than plain radiography. Ultrasound was more accurate and sensitive than clinical examination to detect fractures of the bridge and the lateral wall of the nose. In the case of nasal septal fractures, the accuracy and specificity of ultrasound were higher than plain radiography, and the sensitivity of both methods was the same. In the diagnosis of the bridge and the lateral wall fractures, the diagnostic accuracy in both the surgical and ultrasound methods and in the diagnosis of nasal septal fracture, the diagnostic accuracy in both the surgical and clinical examination methods, were higher than the other methods. According to this study, ultrasound with higher sensitivity and specificity is a useful method in the diagnosis of nasal fractures; Therefore, compared to radiography, ultrasound could be useful as a non-invasive method in the diagnosis of nasal bone fractures in dogs.

**Keywords:** Radiography, Dog, Ultrasonography, Nasal disorders

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## **Effect Of Single Dose Of Pimobendan On M-Mode Echocardiographic Parameters In Healthy Adult Rabbit**

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Pimobendan is a drug commonly given to veterinary patients with heart failure. It is an inodilator, it has both inotropic and vasodilator effects. pimobendan usually used in dogs and little is known about its effects in cardiac function in rabbits. The objective of this study was to investigate the effect of pimobendan on M-mode echocardiographic parameters of left ventricular function in healthy adult rabbits. Eleven healthy New Zealand White rabbits were included in this study. To make sure rabbits are adults we take x-ray picture to check their growth plate. Each rabbit underwent five echocardiographic examinations: the first and second examinations were performed 1 hour apart on day 0. On day 1, the third examination served as baseline, whereas the fourth and fifth examinations were performed 30 minutes and 3 hours after administration of a single oral dose of pimobendan (0.3 mg/kg), respectively. Parameters of left ventricular morphology and function were collected and compared among time points. Pimobendan oral administration in rabbits produced a change in some echocardiographic variables. Specifically, Fractional shortening (FS), Ejection fraction (EF), Stroke volume (SV) and left ventricular posterior wall end-systolic (LVPWs) increased ( $p=0.0001$ ,  $p=0.0001$ ,  $p=0.0284$  and  $p=0.0007$ , respectively), whereas left ventricular end-systolic internal diameter (LVIDs) and End-systolic volume (ESV) decreased ( $p=0.0343$  and  $p=0.038$ , respec-



tively). This study showed that oral pimobendan has positive effects on left ventricular function and improve cardiac function in healthy rabbits. In most previous study, some functional echocardiographic variables like EF and FS were increased by pimobendan administration. In this study we had similar results. Morphology M-mode parameters that changed during this study can be helpful like size reduction of the left ventricle end-systolic and it can be harmful like increased left ventricular posterior wall thickness end-systolic in some of the cardiac disease. Further studies are needed to determine whether pimobendan has similar effects in rabbits with cardiac disease.

**Keyword:** pimobendan, echocardiography, rabbit, cardiac function

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## **Case Report Of Transitional Cell Carcinoma (Tcc) In A 13-Year-Old Dsh Female**

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TCC is a malignant tumor cell carcinoma of the bladder of dogs and cats that is more likely to occur in dogs than cats and in males than females. The location of this tumor is different and is mostly in the neck (trigon) areas of the bladder, and the separation of polyps and tumors is examined based on ultrasound diagnosis of tumor location and urinary cytology. Following referral of a 13-year-old female DSH cat with a history of hematuria, and was referred to the imaging department. On ultrasound examination, the mass was irregular and attached to the



bladder wall, had mixed echogenicity, there was no mineralization, and the mass was seen in the bladder neck and the caudal wall of the bladder. Inflammation of the bladder wall was also evident on ultrasound. In urinalysis, following the cytology of centrifuged urine sediment, a cluster of transitional cells had several criteria of malignancy, including anisocytosis and overt anisokaryosis.

**Keywords:** TCC, bladder, tumor, ultrasound, cytology

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## **Anatomical Study Of Common Fox (*Vulpes Vulpes*) Respiratory System With Ct Scan**

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The aim of this study was to provide an accurate description of the topography and morphometric features and dimensions of the organs in the respiratory system of red foxes (*Vulpes vulpes*). Common fox or



red fox is distributed in most parts of the Iran except the northern rainforests. In this study, four normal healthy male foxes kept at Pardisan Park, Tehran, were studied. After intravenous anesthesia with dexmedetomidine (20 mg / kg) as pre-anesthesia and ketamine (4 mg / kg) to induce anesthesia, the foxes were transferred to an imaging center at the University of Tehran Pet Hospital. CT-scans were obtained from the thorax of each fox. scanning sections were examined and were construction in 3D in Radiant DICOM viewer software. The trachea was bifurcated at the caudal edge of the sixth rib before the beginning of the seventh rib. The thoracic part of trachea was inclined to the right of the midline in the chest and ran from the first rib to the sixth rib, or at most the sixth rib space. The trachea was inclined to the right of the midline in the chest and ran from the first rib to the sixth rib. The mean length of foxes thoracic trachea was  $5.19 \pm 0.58$  cm. The bronchi entered the lungs at the level of the seventh to eighth ribs. There was no significant difference between the length of the left and right bronchi (right bronchus  $2.21 \pm 0.32$  and left bronchus  $2.33 \pm 0.11$  cm). Also, the main bronchi were inclined to the dorsal after being separated from the tracheal bifurcation. The left lung started in front of the right lung in all studied foxes, and the cranial lobe of the left lung started from rib No. 1 and the beginning of the chest. The length of the left lung continued up to the twelfth rib. The right lung starts from the first intercostal space to the second rib and extends to the thirteenth rib. In all studied images, the right lung ended more caudally compared to the left lung. The difference between the right and left lung widths and height was not statistically significant and therefore the left and right lung widths and height were equal. The length of the left lung was longer than the right (right lung  $12.64 \pm 0.12$  and left lung  $15.31 \pm 0.28$  cm). The volume of the left lung was larger than the right (right lung  $11/25 \pm 0.58$  and left lung  $11/13 \pm 0.31$  cubic centimeter). The results of this study are comparable to similar studies on other animals, especially others Caniformia.

**Key words:** Common Fox, Respiratory System, Lung, CT scan

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## **Radiological Evaluation Of Vertebral Column Injuries In Dogs Referred To Tehran Hospitals And Veterinary Clinics**

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Radiography is one of the most important diagnostic tools in spinal diseases. Although other imaging techniques such as CT scan, MRI, radioisotope scanning and other methods are used to examine spinal problems, in most cases, before preparing any of them, the veterinarian prefers to first see a simple radiograph of this area.

The aim of this study was to examine the spine for abnormal curvature of the spine, such as scoliosis and kyphosis. There was numbness or weakness. We also examined osteoarthritis of the intervertebral joints and the collapse (degeneration) of the discs between the bones of the spine in this study.

Examine spinal injuries, such as fractures or dislocations, and evaluate the effects of problems such as infections, tumors, or bone bridges, as well as all complications that can be examined on radiographs of the vertebrae, and examine the relationship between these injuries and age and sex. And the breed of dogs referred to clinics and hospitals in Tehran during 1400 was studied.

Percentage of spinal disorders of thoracic and lumbar vertebrae in different breeds among 100 dogs referred to radiology, Boxer 9.30%, Doberman 13.46%, German Shepard 23.94%, Great Dane 2.08%, Labrador Retriever / 47 10%, Sarabi 2.08%, Pameranin 18.75%, Spitz 14.58% and Pag 5.34%.



The incidence of spinal disorders in different age groups during the study period was 17.89% in the age group 0 to 5 years, 49.75% for 6 to 10 years. 32.36% were observed for 11 to 15 years of spinal disorders. The incidence of spinal disorders in different sexes during the study period was 39.80% in males and 60.20% in females. The incidence of various types of spinal disorders in this study was observed as follows: 37.92% intervertebral disc, 18.92% vertebral fracture, 15.55% vertebral dislocation, 14.66% spondylitis and vertebral infection, and 6.64% vertebral malformations (kyphosis, lordosis and scoliosis), 67.67 1% of spinal canal lesions such as Wembler syndrome and Spina bifida and another 4.65% of spinal cord lesions such as spondylosis and discospondylitis.

**Key words:** Radiography, vertebral column, dog

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**The First Ct Angiography Of Sixteen Slice Thromboembolism Of The Right Subclavian Artery Of The Cat In The World**

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An 8-year-old male sterilized DLH (long-haired domestic) cat with a history of lameness and weight loss with decreased temperature in the right fore limb was referred. On clinical examination, the sensation of deep pain in the right forelimb was positive and its proprioception was negative and complete blood test was normal. The color of the nails and the palm of the right hand turned cyanotic compared to the other organs, which showed a decrease in blood supply to the target organ. Also, this organ seemed colder than other organs in touch and significant pain was seen in the touch of this organ. The patient was referred to the radiology department for echocardiography because of the additional sound in the form of cardiac murmur with the intensity of 4/6 was heard in the patient's cardiopulmonary examination. On echocardiographic examination of the patient, the left ventricular wall became severely diffusely thickened and confirmed the diagnosis of hypertrophic cardiomyopathy. So, considering the patient's clinical signs, the diagnosis of thromboembolism in one of the right anterior arteries was confirmed, thus for more detail of the patient's status

, CT angiography of the right forelimb arteries and neck arteries of the patient was performed. On CT angiography, a large clot was seen in the right subclavian artery at the beginning of the chest entrance and in the first rib section, after that no contrast material was observed in the right subclavian artery and subsequent arteries. According to the reference books, which state that the survival rate of the cases of this disease is very low, unfortunately, the mentioned cat was died 72 hours after the diagnosis. CT angiography is helpful in diagnosing many vascular diseases and we will have a more accurate



evaluation of the arteries by increasing the power of the device (16 slices).

**Keywords:** Echocardiology, Thromboembolism, CT angiography, Cardiomyopathy, Cat

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## First report of metaphysical osteopathy in a DSH cat in Iran

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Metaphysical osteopathy, also known as hypertrophic osteodystrophy, is a disease that causes fever and lethargy with pain in the limbs of large and young dogs at 3 to 4 months of age. The disease has been diagnosed in 40 breeds of dogs as well as in mixed breed dogs. Dogs such as the Great Dane, Boxers, German Shepherd and Irish Setter have a racial susceptibility to the disease, so it is possible that an inherited factor may play a role in the pathogenesis of the disease. There are very rare reports of this disease in cats. However, metaphyseal osteopathy has been described with slipping of the femoral head epiphysis in cats. This complication is characterized by severe swelling of the distal metaphysis of the radius, ulna, tibia, proximal humerus, and cranial region. This is the first case of clinical report of metaphysical osteopathy of cat in Iran. A case of a 7-month-old DSH cat with severe lameness of the left hind limb, open wound and imbalance was referred to Urmia University Veterinary Hospital. Other clinical manifestations such as





fever, anorexia, lethargy, pain during examination of the limb and other limbs were also observed. Evaluation of radiologic graphs showed abnormalities in the proximal and distal regions of the tibia, radius, ulna, humerus, and femur as scattered radiolucent points in the metaphysis. On hematological examination, all blood parameters were within the normal range. Degrees of abnormal increase in neutrophils with a slight decrease in lymphocytes were observed. Total protein was also reported to be above the normal range. Metaphyseal osteopathy was diagnosed according to clinical and radiological symptoms. Treatment was started with oral prednisolone. After one month, the clinical symptoms had significantly improved, and a maintenance dose of steroidal anti-inflammatory drug was recommended due to the course of the disease and its possible recurrence. Therefore, metaphyseal osteopathy in cats can be considered as one of the causes of lameness and movement problems among differential diagnoses.

**Keywords:** Cat, lameness, Metaphyseal osteopathy, treatment, Prednisolone

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## **Ct Scan Features Of Traumatic Atlantoaxial Subluxation In A Two-Month-Old Dog**

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The atlantoaxial joint comprises the first two cervical vertebrae including atlas (C1) and the axis or C2 vertebra. An abnormal movement of the joint causes the atlantoaxial subluxation and extradural compression on the spinal cord. Although this condition occurs most commonly due to congenital malformations such as absence or hypoplasia of the dens or deficiency in the ligaments that support the atlantoaxial joint. Traumatic atlantoaxial subluxation (TAAS) occurs when trauma to the cervical spine results in instability of the atlantoaxial joint. The instability can be as a consequence of fractures of C1 or C2, damage to the supporting ligaments or both. As previous researches represent, radiographic imaging has moderate sensitivity for diagnosing fracture and subluxations of atlas and axis vertebrae. Therefore, advanced imaging procedures such as CT scan should be considered for assessment of instability and spinal cord compression that may not be radiographically visible. Furthermore, imaging the entire vertebral column should be considered because there can be possibility of multiple vertebral fractures and luxation (VFL). A two-month-old husky puppy was referred to the small animal hospital of the Faculty of Veterinary Medicine, University of Tehran, with chief complaint of tetraparesis and history of head and neck trauma. In clinical examination, lower motor neuron (LMN) signs were observed. Also general proprioception on all four limbs and panniculus tests were negative. In the following step, the CT scan was performed which demonstrated fracture of the cranial part of the body of axis. Moreover, dorsal displacement of the caudal fracture fragment with compression on spinal cord was observed and alignment of dorsal lamina of atlas with spinous process of axis has been distorted which could be as a result of injury of supporting ligaments. Advanced imaging findings is crucial for precise evaluation of TAAS and the extent of the injury for presurgical planning. This kind of subluxation (TAAS) is an uncommon occurrence, hence, the exact location of the lesion should be determined. In this case, CT has been shown to have the priority of identifying the extent of the injury, exact location and facilitating surgical planning compared to conventional



radiography.1,2

**Keywords:** CT scan, Atlantoaxial subluxation, Trauma, Dog.

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## **Laboratory And Ultrasonography Findings In A Dsh Cat With Cholangiocarcinoma: A Challenge To The Final Diagnosis**

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There are some diseases in cats that may be confused with Feline infectious peritonitis (FIP) due to the production of body cavity effusions, lymphadenopathy, with inflammatory profile. This study concerns a 12-year-old intact male domestic shorthair cat presenting with inappetence, weight loss, abdominal distention, and jaundice admitted to the Small Animal Hospital, University of Tehran. The patient had been given a preliminary diagnosis of FIP in another veterinary clinic. Hematology findings showed mild anemia and regenerative left shift. Serum biochemical analysis revealed marked elevation of GGT, AST, ALT, and ALP activity with hyperproteinemia and bil-



irubinemia. Based on laboratory findings, there was a possibility of septic cholangiohepatitis and obstructive jaundice. Ultrasonographic examination of the abdomen revealed massive abdominal free fluid, hepatomegaly, pancreatopathy, splenopathy, moderate lymphadenopathy and mildly enlarged duodenal papillae with echogenic contents, cholecystitis and as a result, thickening of the gallbladder wall (2mm) which presumably could justify ultrasound findings. Furthermore ultrasonography findings showed an infiltrated hyperechoic mass bulged into the lumen of common bile duct (CBD) with the size of 4\*2.5 cm (height-length respectively) which caused complete CBD obstruction. Ultrasound-guided fine-needle capillary sampling of the intraductal mass and fine-needle aspiration of free peritoneal fluid (5ml) were performed under aseptic conditions. Cytological assessments of the CBD sample were consistent with cholangiocellular carcinoma. In cytology exam, there were relatively uniform cuboidal epithelial cells, with a scant amount of cytoplasm arranged in densely packed sheets. The laboratory assessment revealed the presence of neoplastic cells and a modified transudate nature of the sample obtained from abdominocentesis. The albumin to globulin ratio was less than 0.5 and the Rivalta test was negative. Cholangiocellular carcinoma(CCA) is the most common primary liver neoplasm arising from the bile duct epithelial cells. CCA is a relatively uncommon neoplasm that accounts for less than 1% of all neoplasms in cats. Based on the foresaid high rate of future metastasis with the lack of chemotherapeutic options for CCA in cats, the owner refused further surgical intervention and opposed euthanasia. This report demonstrates that due to the high prevalence of FIP in cats, other diseases with similar clinical, paraclinical and radiological signs should always be considered before the diagnosis, and ultrasound accompanied with paraclinical studies have an essential role in accurate diagnosis.

**Keywords:** cholangiocellular carcinoma, ultrasound, clinical pathology, bile duct carcinoma, FIP

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## **Ultrasound And Ct Scan Findings Of A Kidney With Severe Unilateral Pyonephrosis In A 1-Year-Old Rottweiler Male Dog - A Case Report**

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Pyonephrosis is a term which describes a suppurative hydronephrotic kidney which arise from pyelonephritis followed by purulent sediments accumulation in a dilated renal pelvis or hydronephrosis associated by an ascending infection. An intact 1-year-old Rottweiler dog weighing 20 kg with a distended belly and normal appetite was referred to the Small Animal Hospital of the Faculty of Veterinary Medicine, University of Tehran. The clinical examination finding were a muffled heart sound on auscultation, normal BCS , abdominal effusion. In sonographic assessment, the left kidney was appeared as an extremely large cystic structure filled with echogenic fluid with a thin cortical rim. The renal parenchyma was almost completely obliterated and there was no evidence of renal parenchyma. Other ultrasound evidence were echogenic sediments settling to the renal pelvic. These sonographic findings confirmed pyonephrosis. Ultrasound-guided cystocentesis was performed under aseptic condition. Follow the location of the caudal portion of the ureter below the pubis bone and the impossibility of fully examination of the whole path for ureteral obstruction or aberrant termination of the left ureter, computed tomography examination was performed with in-



travenous administration of iodinated contrast medium. And the results repudiated the presence of calculi or aberrant termination in the path. Left kidney size was reported 27.5\*21\*16 (length-width-height respectively) extending at the level cranial aspect of the 11th thoracic vertebrae to cranial aspect of 7th lumbar vertebrae and maximum size of dilated ureter was measured 4.4 cm. Complete blood cell count, serum chemistry profile, and urinalysis findings were included: non-regenerative microcytic anemia, leukogram degenerative left shift, hypoalbuminemia, hyperphosphatemia, proteinuria, hematuria, high serum creatinine concentration and, which all confirmed the presence of inflammation, CKD, renal failure, UTI and pyuria. As complete loss of renal parenchyma and to avoid septic shock, surgical intervention with complete nephrectomy was performed While the kidney structure contained about 5 liters of exudative contents. But due to hypovolemic shock the dog was expired during the surgery. This study can be considered as a confirmation of the key role of ultrasound diagnostic method in differentiating pyonephrosis from hydronephrosis.

**keywords:** Pyonephrosis, Pyelonephritis, Nephrectomy, Hydronephrosis, Ultrasonography

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## **Supraspinatus Tendinopathy: Clinical Sign, Radiographic And Ultrasonographic Findings And Treatment In An Adult Golden Retriever Dog – A Case Report**

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Shoulder joint is one of forelimb joints and it is where distal part of scapula and proximal part of humerus meet. Joint capsule, biceps brachii tendon, supraspinatus tendon and ligaments are other parts of this joint. This joint can suffer from many diseases like avulsion, tendinopathy of biceps brachii or supraspinatus tendons and etc. Supraspinatus tendon connects supraspinatus muscle to greater tubercle of humerus, in some conditions; it may be torn or calcified. Calcification of this tendon can cause pain in shoulder area and non-weight bearing lameness in forelimb. Pathogenesis of calcification in this tendon is unknown. Surgical or medical treatment is recommended in this disease. In this study we are discussing about a mature male Golden Retriever dog with non-weight bearing lameness of his right forelimb which his owner suddenly had noticed it. Orthopedic specialist got suspected to calcification of supraspinatus tendon of right forelimb. Radiographic examination showed mineralized focus in cranial aspect of greater tubercle and ultrasonographic examination showed there was a heterogeneous degenerated part in insertion of the right supraspinatus tendon associated with a well-defined irregular hyperechoic focus (mineralization) with peripheral anechoic area. The shoulder area was scrubbed and methylprednisolone acetate was injected to supraspinatus tendon sheath under ultrasound guide. An hour later, symptoms of pain and lameness disappeared. About 6 month later, the dog was brought with the same symptoms of last time but in left forelimb, so the same examinations were done on left shoulder joint and the same problem detected and the same medication at the same condition were injected to the left supraspinatus tendon sheath. This time the symptoms lasted a bit longer but according to the follow up, they were disappeared 1 week after injection. Weight bearing lameness and pain haven't returned since first and second injections. In conclusion, ultrasonography is helpful in diagnosis of supraspinatus calcifying tendinopathy and injective anti-inflammatory treatment is responsive, so this method is effective.

**Keywords:** Supraspinatus tendinopathy, Shoulder joint, Ultrasonography, Methylprednisolone acetate

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## **Peripheral Odontogenic Fibroma In Male Boxer 7 Years Old Dog Refers To Small Animal Hospital, University Of Tehran: A Case Report**

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Odontogenic tumors mainly occur as intraosseous growths but sometimes may present in a peripheral location on the gingiva where they are referred to as peripheral odontogenic tumors (POTs) which are a rare entity, the most common of them being the peripheral odontogenic fibroma that is an otherwise uncommon, slowly growing, benign odontogenic neoplasm of the periodontal soft tissues. The World Health Organization (WHO) defined it as a benign odontogenic neoplasm of fibroblastic origin. This lesion has been seen in all age groups and in both Mandibular and Maxilla.

It appears as a firm, slow-growing and usually sessile gingival mass covered by normal appearing mucosa. Clinically, it cannot be distinguished from common fibrous gingival lesions. Encountered mainly on facial gingiva of mandible, with incisor-canine and premolar area being the most common sites, they seldom cause displacement of teeth. Rarely, multifocal or diffuse lesions have also been described.

A cryptorchidism (male) boxer 7 years old dog with oral tumors (odontogenic fibroma) from mandibular has been referred to small animal hospital of The Faculty of Veterinary Medicine, University of Tehran.





Radiographic signs including moth-eaten lytic lesion and amorphous periosteal reactions were seen in the areas around the right mandibular, indicate that the lesion is aggressive. fine needle aspiration was taken from pre scapular lymph node and oral mass. For more accurate diagnosis, histopathological sections were prepared from surgical lesions of this case. Histopathological examination showed odontogenic epithelial with bundles of collagen throughout the lesion. Peripheral odontogenic fibroma does not involve the underlying bone and only sometimes shows areas of calcification on radiograph.

Conclusion And final diagnosis according to radiographic images, histological sampling and preparation of histopathological sections of the lesion are odontogenic fibroma.

**Keywords:** odontogenic fibroma, moth-eaten, periosteal reaction, collagen bundles

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## **Echocardiographic Findings Of Pulmonary Artery Thrombus In A 4-Years-Old Dog With Lymphoma**

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Clinical signs of PTE are widespread and nonspecific depending on the extent of underlying disease and thromboembolic occlusion. Complications such as IMHA, cardiac disease, neoplasia, systemic bacterial disease, protein losing nephropathy and hyperadrenocorticism should



be considered as high risk diseases for prevalence of pulmonary thrombosis. Many other predisposing conditions for development of PTE includes intravenous catheterization, excess exogenous glucocorticoid consumption, use of cytotoxic agents, recent surgery and blood transfusion. PTE can occur in any age, sex or breed of dog. It may be manifested with various presenting clinical signs or physical examination abnormalities because it is almost exclusively a secondary disease. No pathognomonic laboratory finding for PTE has been declared but hematological findings will be aid in the diagnosis of primary disease conditions. A 4-year-old mix breed dog were examined with clinical signs of anorexia, respiratory distress, reluctance to move and abdominal distention. Decreased HCT, HB, RBC, MCV, MCH and increased ALT, Alp and serum urea were revealed in laboratory finding. Abdominal ultrasound was performed and Large amount of peritoneal free fluid, Swiss cheese appearance of spleen, hepatomegaly with multiple small nodular lesions, mesenteric lymphadenopathy and lymphadenomegally were detected. In cytological examination by FNA from spleen and lymph nodes and abdominocentesis lymphoma were diagnosed and nodular lesions of he liver were diagnosed to be benign nodular hyperplasia. For further evaluations, echocardiography was done and right ventricular and atrial dilation, high velocity tricuspid regurgitation (2.6 m/s), paradoxical ventricular septal movement and large echogenic thrombus formation presents in main pulmonary artery bifurcation with dilation of main pulmonary artery annulus. Increased pulmonary vascular resistance resulted to pulmonary hypertension and presence of ascites (transude), hepatomegaly and dilatation of caudal vena cava confirms right sided heart failure due to incomplete occlusion of pulmonary artery by thrombus.

Pulmonary artery thrombosis should be considered in cases of dyspnea, respiratory distress and right-sided heart failure of unknown origin. Blood-gas analysis, radiography, echocardiography and angiography if available aids in diagnosing the condition.

**Keywords:** Thrombus, Pulmonary artery, Echocardiography, dog, lymphoma

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## **A Report Of Successful Treatment Of Paralysis And Spinal Cord Injury Due To A Gun Projectile By Hemilaminectomy In A Mixed Breed Dog**

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These injuries usually have a high severity so it is very important to perform detailed and specialized examinations to assess the severity of the lesion and the prognosis of treatment. A 3-year-old intact male mixed breed dog was referred to the Small Animal Hospital, University of Tehran one day after the onset of symptoms of paralysis. Clinical signs including wound around the spine, urinary and fecal incontinence, complete paraplegia of rear limbs, positive nociception in both hindlimbs, increased forelimb muscle tone (Schiff Sherrington syndrome), exaggerated patellar reflex, and negative anal reflex revealed a recent SCI and so diagnostic evaluations were performed to investigate the cause of the injury. The patient blood test showed an increase in AST, ALT, and ALP enzymes. The patient was first evaluated using radiography and then by computed tomography (CT). Radiographs (of the lateral and dorsoventral views) and CT showed a small metal structure near the spinal cord with damage to the ninth and tenth thoracic vertebrae walls which indicated a gunshot between the T9 and T10. The presence of the bullet on the right side and the wound and perforation



caused by the bullet on the left side indicated that the bullet path had damaged parts of the spinal cord. According to the patient's condition and the clinical signs, the bullet was removed from the spinal canal by hemilaminectomy. After surgery, physiotherapy was recommended to improve mobility. After a few months of surgery, the patient was in good neurological and locomotive condition, and also there was no problem related to this surgery 10 months after the operation.

**KeyWords:** Gunshot, Spinal cord, Hemilaminectomy

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## **Occurrence And Clinical Diagnosis Of Progressive Myelomalacia In Two Dogs**

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An 8-year-old male neutered Shih Tzu Terrier dog with symptoms of sudden paraplegia was referred to Small Animal Hospital, Faculty of Veterinary Medicine, University of Tehran. Neurological examinations revealed negative general proprioception, negative deep pain sensation, absence of patellar and sciatic reflexes, and negative withdrawal test in hindlimbs, negative panniculus before L4-L5 vertebrae, urinary incontinence, and normal forelimbs. Plain radiography and computed tomography with contrast medium were performed to confirm the diagnosis. Radiographs showed compressive intervertebral disc extrusion at L4-L5 intervertebral space associated with impingement of right nerve



root by herniation of disc materials between mentioned vertebrae and non-compressive intervertebral disc protrusion at the level of L5-L6 intervertebral space. Preoperative examinations on the day before surgery showed previously mentioned symptoms, but the panniculus was negative before the T12-T13 vertebrae. In addition, no lesions were found on examination of the cranial region and cranial nerves. Progressive myelomalacia was suspected due to the condition. The next day, after informing the owner about the prognosis of the disease and despite the progression of the disease, hemilaminectomy and extended durotomy were performed at the request of the owner. Three days after the surgery, the clinical signs progressed again and tetraplegia, negative deep pain sensation in the forelimbs, paradoxical breathing, and aphonia were observed, which resulted in the decision to euthanize the patient. A 5-year-old intact female dog with symptoms of lameness in the hindlimbs, hyporexia, and incontinence in urination and defecation was referred to Small Animal Hospital, Faculty of Veterinary Medicine, University of Tehran. Neurological examinations revealed negative general proprioception, negative deep pain sensation, exaggerated patellar and sciatic reflexes, positive withdrawal test and UMN signs in hindlimbs, negative panniculus before T13 vertebrae, and normal forelimbs. IVDD was suspected and to confirm the diagnosis, plain radiograph revealed multiple calcified disks and computed tomography revealed intervertebral disc extrusion at T11-T12 intervertebral space. Two days later, preoperative examinations revealed decreased spinal reflexes, negative perineal reflex, negative deep pain sensation in the hindlimbs, tetraplegia, dysphonia, and negative panniculus. Progressive myelomalacia was suspected due to the condition. Due to the poor prognosis of the disease and the patient's condition, the owner decided to euthanize the patient without surgery.

**Keywords:** Progressive Myelomalacia – Laminectomy – Dog

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## **Fracture of Distal third of medial splint bone in a stallion**

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Injuries to the second and fourth metacarpal and metatarsal bones can occur anywhere along the length of the bone in horses of any age. The scarce soft tissue covering of the small vestigial metacarpal and metatarsal bones in addition to their location makes them particularly vulnerable to external trauma. An 8 years old KWPN stallion referred to large animal hospital of university of Tehran with history of lameness in left hindlimb. After initial clinical examination presence of third degree of AAEP lameness in left hindlimb diagnosed and after radiographic examination a fracture in distal third of medial metatarsal bone confirmed. Intravenous ketamine and xylazine used for induction of general anesthesia and after endotracheal intubation, Isoflurane used for maintenance of anesthesia. Surgical site prepared aseptically and a 5 mm incision was made directly over fracture site. Soft tissues dissected and primary callus removed. Distal fragment of fracture excised and removed from fracture site. Soft tissues closed in routine method. Pressure bandage applied for 14 days. Penicillin used as prophylactic antibiotic and continued for 3 days. Phenylbutazone used as treatment of choice for pain control. After 14 days exercise program which consist of 2 weeks of walking, 2 weeks of trotting and 2 weeks of canter without rider recommended. 30 days after surgery the patient evaluated and no lameness observed. Concurrent soft tissue injuries of deep digital flexor tendon, superficial digital flexor tendon and suspensory ligament of most important complications after splint bone traumatic injuries. In these patients these tendons and ligament evaluated before and 30 days



after surgery by ultrasonography and no injury was diagnosed in these structures. Distal and mid-body fractures are recommended to be managed surgically with removal of the distal fragment of the splint bone, removal of callus, and excision of the most distal aspect of the remaining proximal fragment. This treatment provides a quick recovery and return to previous use by avoiding excessive callus formation, which may lead to secondary suspensory desmitis and chronic lameness. The prognosis is generally good and complications are rare, unless other abnormalities are present.

**Keywords:** lameness, stallion, splint bone, fracture

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## **Studying of Lesions of Proximal Sesamoid Bones in Horses in Riding Clubs**

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Lameness is one of the most common causes of poor performance in sport horses. Diseases or injuries of the musculoskeletal system are major causes of poor performance of sport horses. The fetlock joint in horses is prone to various injuries and lameness, and sesamoid bone inflammation is one of the abnormalities of the fetlock joint in horses. For this study, 32 horses with lameness and musculoskeletal problems were selected for the study after clinical examinations with suspected complications in fetlock. Horses were examined for appearance and



any changes such as soft tissue inflammation, stiffness, pain response in flexion tests and tactile and percussion tests. Radiography was performed. First, radiographs were prepared with lateral and dorsal placement of the sole and, if necessary, oblique and flexed radiographs were taken. After a definitive diagnosis, treatment was performed. The limbs that have lameness and sesamoid bone inflammation were identified and the following results were obtained: cranial limb was 71.87% and caudal limb was 28.12%. If signs of lameness were observed, radiographs were taken of the limb. Radiographic signs were divided into 6 categories: reduction of bone density by 12.5%, formation of new bone growth at the edges of the bone by 9.37%, intraosseous cysts by 15.62%, new bone growth at the edges of the bone and intraosseous cysts by 18.75%, joint inflammation without observing bone complications and bone changes by 28.12%, joint inflammation with inflammation of the flexor tendons without signs and bone changes by 16.52%. Then the necessary treatments were performed: in all cases, 10 days of rest in addition, the administration of ketofen for 5 days; Administration of phenylbutazone for 5 days; Intra-articular administration of methylprednisolone 80 mg once; Intra-articular administration of triamcinolone 15 mg once. Treatment results: 50% were completely cured and 31.25% partially responded to treatment but 18.75% of horses did not respond to any treatment. The incidence of this complication is higher in the forelimbs, especially in adult horses, but in foals, it occurs more in the hindlimbs. Examination of radiographs showed that arthritis without bone lesions and bone changes had the highest rate of sesamoid bone lesions in horses and the highest response to treatment is in the same group.

**Keywords:** Horses – axial sesamoid bone - Fetlock joint lameness

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## **The Effect Of Intra Articular Administration Of Morphine On Synovial Fluid And Sds-Page Of Synovial Fluid Proteins In Donkeys**

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Today, due to the abundance of injuries to the limbs, including the joints in humans and animals, the need to use analgesics is felt more than ever. In order to investigate the effect of intra-articular injection of morphine on the electrophoretic pattern of joint fluid proteins, research was performed. Fifteen female donkeys of approximately equal weight were selected for the study. Two doses of 0.05 or 0.1 mg/kg were used. Before the operation, the hair in the area was shaved and antisepticated with soap, betadine and alcohol. No anesthetics were injected. Before sampling, the animals were divided into 3 groups of 5. Group 1(control): The same amount of joint fluid obtained from saline solution was injected into the joint. Group2: Morphine sulfate at a dose of 0.05 mg/kg diluted with saline was used. Group3: Morphine sulfate at a dose of 0.1 mg/kg diluted with saline was used. After preparation and before the drug injection the first sample of the joint fluid from the knee joint in a bent position were took as the control sample. The drug was injected in a volume equal to the sample taken in the joint and 24 hours later, again from the same joint the second sample were taking. The articular fluid samples were centrifuged after transferring the samples to the laboratory, and the resulting precipitate was expanded and the supernatant was transferred to a clean tube stored at sub-zero temperatures for subsequent experiments. The study was per-



formed on the joint fluid protein of the groups by SDS-PAGE method using a concentration gradient of 5 to 20%, in which the percentage of joint fluid protein gel was separated and compared with the standard protein studied. In electrophoretic examination of joint fluid proteins, more than 26 protein bands were separated. It contains proteins with a molecular weight between 5 and 208 kDa. These protein bands can be divided into proteins with an approximate molecular weight of 11,14,20,25,29,45/50, 57, 66(the most), 69 and 77 kDa. In comparison between pre- and post-injection samples, an increase in the amount of 3 protein bands with approximate molecular weights of 9,25,57kDa was observed in a number of post-injection samples belonging to all three groups. The results of electrophoretic pattern in the 3 groups showed that morphine is a suitable drug for intra-articular use to relieve joint pain without any visible side effects.

**Keywords:** Intra-articular injection, morphine, donkey

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## **Surgical Resection Of A Bone Mass In The Anterior Region Of The Lower Right Lower Jaw Of A Arabian Stallion**

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Patient Description - Bone masses usually have unknown cause and



can be benign or malignant. A case report of bone mass in the ventral border of rostral part of right mandible of an Arabian stallion that was surgically removed.

**Clinical Findings** - A seven-year-old Arabian stallion with a unknown cause bone mass at the ventral edge of the anterior right mandible with 5 cm diameter was referred over the last year. In the history taken, no discharge or bleeding was seen from the aforementioned area and no pain was felt in the animal during physical examination and palpation. radiographic evaluation showed no mass aggressive mass in the mandibular bone tissue and no connection with the teeth structures. Due to bone tumor suspicion and its effect on the horse beauty, the decision was made to surgical removal of bone mass.

**Treatment and Outcome** - The horse was operated through standing sedation and regional anesthesia. intravenous combination of acepromazine (0.05mg/kg) and detomidine (0.01mg/kg) provided good sedation, and then using local injection of 2 % lidocaine in the mandibular nerve area, mandibular nerve block was obtained and suitable analgesia was provided for right mandibular surgery. A longitudinal incision was made on the ventral surface of the bone mass and then the tumor base was exposed by blunt dissection. Then, using gigliwire and rongeur forceps, the bone tumor was isolated from the mandibular base considering healthy tissue. Up to two years after surgery, there was no report of recurrence of this bone mass.

**Clinical application** - Clinical application of this surgical method for removal of bone masses in the mandible without need for general anesthesia and and performed through sedation in a standing position

**Keywords:** jaw tumor, horse, surgery

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## **Return To Performance With Complete Excision Of Distal Left Second Metacarpal Bone Fragment By On-Site Radiology Assistant In A Kwpm Stallion**

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The equine orthopedic disorders are so serious can cause the horse to be removed from his sports activities forever. Fractures of the splint bone in horses are commonly seen in practice. A 12-year-old KWPN stallion with history of lameness in the left hand as well as swelling and the presence of a hard mass in the involved site was referred to the teaching large animal hospital of the faculty of veterinary medicine, University of Tehran. On radiology, the fracture of distal left second metacarpal bone was diagnosed. After administration of the prophylactic antibiotics, the stallion was anesthetized in general anesthesia. After preparation of surgical site, the skin, subcutaneous and fascia over the firm swelling region were incised. Afterward the involved site was bounded by on-site radiology to release of periosteal, intraosseous ligament and callus involvement by periosteal elevator and the part of fragment was removed with curette. The remaining of the distal fragment of splint bone and the mineralized tissue were excised from the most distal site next to suspensory ligament using an osteotome and then radiographs was made. The distal end of the second metacarpal bone was corrected and smoothed with an osteotome, and finally the fascia, subcutaneous tissue and skin were sutured. Limb bandage was done. Postoperative antibiotics including cefazolin and gentamicin, Phenylbutazone, fluid therapy and physiotherapy were performed to 3 days so that the horse was discharged in a favorable condition. Fractures of the distal splint bone are mainly encountered in performance horses and occur at exercise, while fractures of the proximal splint bone are



traumatic in origin and usually have an associated wound and infection. When investigating lameness or a wound localized to the region of the cannon bone, splint bone fractures can often be overlooked due to the vestigial nature of the splint bones and their close relationship to the cannon bone, the suspensory ligament and synovial structures at both their proximal and distal extents. Complete and accurate excision of bone fragment and the formed callus using simultaneously on-site radiology would be helpful for horses to return to performance. Six months after surgical treatment, the stallion restored to normal exercise performance successfully.

**Keywords:** Splint- Return to Performance- Radiology – Horse

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## **Morphometric Measurements Of Hoof Indices Before And After Hoof Trimming**

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Anatomical features of hoof may change with improper shoeing, delay in trimming and shoeing, activities, such as show jumping etc. Balance of the hooves may change by its growth which should be fixed in trimming and shoeing. This study, was held in Mashhad on trimming and shoeing of the horses. Thirty healthy horses aged 9.5 years were se-



lected. Photos were taken from lateral and solar sides of hooves using a scale, before and after trimming. Heels and toe angles, the length of heels and toes, the height of heel and toes, hoof length, width, middle hoof angel, side hoof angle were measured. Over 2880 measurements on 480 photos were done by using the scale in Image J software. The heel angel recorded as  $35/8 \pm 73/49$  degrees in forelimbs and  $35/50 \pm 7/43$  degrees in hind limbs which was higher than reported length. Toe angle in fore and hind limb recorded as 51.6 and 53 degrees respectively. Although toe degree in fore limbs recorded less than hind limbs as previous reports but its measurements in forelimbs recorded as 52.6 that is higher from previous standard reports. Toe angle in hind limbs recorded as 53.5 that is closed to previous standards. Similar toe angles in fore and hind limbs is not acceptable following hoof trimming. Lateral and medial angles in solar view of fore limbs recorded and 90 and 89.9 and in hind limbs 90.6 and 89.3 in lateral and medial angles in solar view. We didn't find any similar study in Iran. No prominent difference in other measurements were recorded.

**Keywords:** Hoof trimming, Horse, furriery, hoof measurements

## **Achilles Tendon Healing Using Photochemical Tissue Binding In Rats: Biomechanical And Functional Evaluations**

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Tendon repair presents a major clinical challenge in orthopedic surgery. Tendon is poorly vascularized and therefore heals slowly. Photochemical tissue bonding (PTB) is an emerging technique for bonding or sealing tissue surfaces which involves using specific dyes and light-activation to initiate a chemical reaction that forms cross-links with collagen fibers. The aim of present study was to examine the potentials of PTB for tendon repair using functional and mechanical evaluations in a rat model. Thirty-two adult male rats were randomly divided into four equal groups including 1) control, 2) Rose Bengal, 3) Laser, and 4) Rose Bengal+Laser. Under general anesthesia, the left Achilles tendon was aseptically exposed and transected. Then, it



was sutured in modified Kessler pattern using 4-0 nylon. In the control group, no further intervention was done. In group 2, after suture placement, the tendon was irradiated with 532 nm green laser from 3 cm distance. In group 3, tendon stumps were impregnated with 0.1% rose Bengal solution prior to suture placement. In group 4, rose Bengal impregnation and laser irradiation were performed. During the experimental period, Achilles functional index (AFI) was recorded weekly. Eight weeks after surgery, sampling was done. The data were analyzed using one way ANOVA and Mann-Whitney tests. Biomechanical evaluation showed a significant increase in tensile strength of the tendon in group 4 compared to the other groups in terms of ultimate load, yield load, stress and stiffness. However, energy absorption was significantly higher in group 3 in comparison to the other groups. The walking track analysis indicated significant improvement in functional recovery of Achilles tendon in group 4 from the 3rd week until the end of study. Adhesion formation in group 3 was lower compared to the three other groups. Also, lower adhesions were observed in groups 2 and 4 compared to the control group. The results of the present study showed that PTB using rose Bengal and green laser could improve functional index and increase tensile strength of Achilles tendon in rats.

Keywords: Achilles tendon, Adhesion, Green laser, Rose Bengal, Tensile strength

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## **Case Report: Surgical Fixation Of Fractures Of Radius And Ulna In An African Hedgehog (*Atelerix Albiventris*)**

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**Description and clinical finding:** A 3-year-old female African hedgehog (*Ateleris albiventris*) presented with instability of both hands was referred to veterinary hospital of shahid chamran university of ahvaz. Radiographic examination showed transverse fractures of radius and ulna both hands. **Treatment and outcome:** the induction and maintenance of anesthesia done via properly fitted face mask with the percentage of 4% and 2% respectively. The surgical treatment of ulnar and radial simultaneous fracture is IM pin inserting of proximal end of ulna (olecranon process). We used a 22 G angio-catheter as pin for this purpose. Despite many attempts to insert the pin from the proximal side (olecranon process) of the ulna and due to the fineness and fragility of the hedgehog bones, we had to insert the pin from the distal end of the bone. For comparative purposes we inserted one pin into ulna and the other into radius. The animal experienced a gentle recovery. After three weeks of care and administering antibiotics and analgesics, the bones healed and no side effects were observed. **Clinical relevance:** To fix radius and ulna fractures in hedgehogs, it is not necessary to insert the pin from the proximal side of the bone and acceptable results can be obtained from inserting the pin from the distal side. To our knowledge this is the first report of surgical fixation of radial and ulnar fracture in hedgehog.

**Keywords:** African hedgehog, radius fracture, ulnar fracture, orthopedic surgery, exotic animal surgery

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## **Radiographical Comparison Of Osteogenesis By Using Adipose Drived Stem Cells In Critical Size Defect In Dogs Mandible**

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Trauma, congenital diseases, and bone resection surgeries would lead to a reduction of the bone volume. One of the crises in the field of oral and maxillofacial surgeries is bone deficit regeneration. In the case of large bone defects, this regeneration would not occur spontaneously, even if it would occur the bone would not be integrated. Due to the fact that there are limitations related to bone grafts, it is more reasonable to perform cell therapy and tissue engineering in order to major defects regeneration and accelerating their recovery. The purpose of this study is the expansion of previous studies' results in the field of bone defect regeneration to larger animals such as dogs and to the larger defects. In this study there were two groups consist of 6 male mature dogs; a) control (gelatin sponge scaffold without cells) and b) gelatin sponge scaffold along with stem cells derived allogeneic adipose tissue. For receiving adipose, a mature dog that did not belong to the study group was chosen. Adipose mesenchymal stem cells were separated from visceral adipose tissue and were cultured in the DMEM-Dulbecco's Modified Eagle's Medium which contained penicillin and streptomycin. After identification, these cultured cells were placed on the gelatin sponge. This sponge was replaced on the 3cm-mandible defect (which was without cell in the control group and was fixed in the mandible lesion location along with screw and plate). The stage of mandible regeneration is categorized based on the degree of regenerated bone integrity



and also the degree of bone remodeling (the degree of remodeling was determined based on the transparency of cortex and medulla shown by radiographs). Three cases were chosen as the control group and were just treated with gel foam without cell. In contrast, three cases were chosen as the study group and were treated by using stem cells derived from visceral adipose along with gel foam. One case that belonged to the study group was given a score of 5, which means that the bone was integrated and remodeled completely. It is likely that more positive results would be obtained if the chosen study group would be larger in size.

**Keywords:** Stem cells, scaffold, gelatin sponge, tissue engineering

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## **Tibiotarsal Fracture Repair In A Hoopoe (Upupa Epops) Using An Intramedullary Pin**

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Bone cortex in birds is less strong than that of mammals, so they are more prone to fractures. Stabilization of long bones with an intramedullary pin is one of the surgical methods that used in open fractures and in this surgery.

**Key words:** hoopoe, fracture, IM pin

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## **Comparison Of Three Methods Of Fixing Femur In Salter Harris Fracture In Dog**

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Fractures of growth plates are injuries that occur in growing animals. These lesions grow in the area of the bone that is responsible for growth, at the end of the long bones. Orthopedic surgeons classify growth plate fractures according to the Salter-Harris system. Salter-Harris 1 fracture occurs in more immature animals (4-11 months old dogs) and the transverse fracture is through the growth plate and has a 6% chance of occurring. These lesions act directly on the growth plate and do not involve the surrounding bone. Radiographs of an animal with Salter-Harris 1 fracture often appear normal. The appropriate treatment for these injuries is surgery with 3 methods, which include: Double pin, Cross pin, Rush pin. The aim of our study was to compare these 3 methods of bone stabilization in terms of the time it takes for the clinic to heal (when we can remove the pins) and how the animal returned to function (how long it takes for the animal to return to normal life). In the small animal clinic of Shahrekord Islamic Azad University in Isfahan in 1397-1399, more than 60 dogs referred to our study period. We randomly operated on 20 dogs with this fracture with each of these



3 methods. After surgery and pinning, we examined the animals and found that approximately 3-5 weeks after surgery, all signs of clinical fusion were seen and we could remove the pins. Symptoms of clinical fusion were seen in animals operated on by Rush method 3-4 weeks later, in animals operated on by Cross method 5-4 weeks later, in animals operated on by Double method 5-6 weeks later. After seeing the signs of fusion and removing the pins, we examined the treated animals in terms of when they can return to their normal function. Animals operated by Rush method 6-8 days later, Cross method 7-9 days later and Double method more than 14 days reached to the normal function. After reviewing the results in this study, the best methods in terms of higher speed of clinical fusion and return of the animal to its normal function are respectively Rush, Cross and Double methods.

**Keywords:** Dog, Salter Harris Fracture 1, Rush pin, Cross pin, Double pin

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## **Tibiotarsus Fracture In A Cockatiel, A Case Report And Its Treatment**

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A cockatiel afflicted with the damage history in distal region of left pelvic limb was referred to the department of veterinary surgery and radiology of clinic. Clinical signs included severe lameness, swelling and pain in the palpation and not bear weight on the involved limb. In the evaluation of the region's radiology section, the fracture of the Shaft left tibiotarsus bone was determined. Isoflurane gas and inhaled anesthesia were used for bird anesthesia. The final treatment for surgical intervention was chosen to establish the internal fixation of fracture parts by using the intramedullary (IM) pin method and then using the external splint. After surgery the bird limited in the cage was considered for 4 weeks. In follow up, the bird was fully recovered after 4 weeks. Tibiotarsus bone forms by jointing tibia with the upper row bones of the tars. Due to the fact that birds have small, and sometimes hollow bones, it is not unusual for them to break them due to trauma. Falling off a perch, being injured by another animal, or even being stepped on by its owner are some of the more common causes of a fracture. Sometimes there are underlying problems causing the bones to be weak and susceptible to fracture during normal activity. The tibiotarsus bone is the one most commonly fractured. A fractured leg (broken bone) in a bird can be an emergency. They have very little blood, and blood loss can occur from the bone. They are also susceptible to pain and shock, which can be life threatening. Stabilization through the IM pins is the fastest method for treatment. The proximal region of the tibiotarsus can compress the fibular nerve and cause nerve disorders. The fractures of the distal part of the tibiotarsus are common in hawks and parrots. To access the tibiotarsus bone and to avoid vessels and nerves in this part of the leg it is best to use a cranio-internal approach. Using IM pin for tibiotarsal fracture bone alone without the support of the external splint is not quite satisfactory; Despite this combination of IM pin and using the external splint, it is more rational and appropriate. Using cross pins can be helpful in preventing this problem.

Key words: Fracture, tibiotarsus bone, IM pin, Cockatiel

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## Case Report: Internal Fixation Of Ilium Multiple Fracture In A Puppy

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A three-month-old puppy with a history of vehicular trauma referred to the veterinary hospital of Shahid Chamran University of Ahvaz, In april 2022 a day after the accident. A three-segmented fracture in the ilium wing was confirmed by clinical examination and radiography of the pelvis, treatment was performed as follows.

After initial examinations, a combination of ketamine (5 mg / kg) + acepromazine (0.05 mg / kg) is prescribed as pre-anesthesia and after initial preparation of the surgical site, induction of anesthesia using a combination of ketamine (5 mg / kg) + Diazepam (5 mg / kg) was performed. After the endotracheal intubation, anesthesia was continued using isoflurane anesthetic with a concentration of 1.5 % .

The patient received a dose of prophylactic antibiotics (cefazolin 22 mg / kg) and analgesia before surgery including injectable tramadol (4 mg / kg) and ketoprofen (2 mg / kg) . surgical incision was made from the dorsal approach on the ilium wing. In order to fix the fracture, three intramedullary pins including one pin with a diameter of 1 mm and two pins with a diameter of 0.8 mm and also a bone plate of 1.5 mm were used.

Post-operative care included prescription of tramadol and ketoprofen at recent doses for three days, cefazolin at 22 mg / kg for seven days, and use of an ehmer's sling for one week.

The results of observation during surgery and the radiography after



that, showed successful reduction of the fragments and the bone fragments were placed in their proper position with sufficient strength. Also, the patient recovered smoothly was discharged after full recovery of consciousness.

Following the pelvic fracture, the patient lost the ability to defecate, which was remedied after treatment and correcting pelvic outlet back to its normal situation. The importance of fixing this fracture is relieving pelvic canal stenosis, relief rectal pressure and difficulty in approaching the ilium.

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## **Reconstruction And Stabilization Of A Case Of Pubic Bone Fracture Leading To Pelvic Collapse In A Dog**

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Most fractures of the ischium and pubis are associated with other major fractures or luxations of the pelvis (acetabular, ilium, sacroiliac). when other pelvic fractures achieve surgical stabilization, restoration of pelvic structure and stability is usually sufficient for weight bearing; therefore, no fracture treatment is needed for ischial or pubic injuries. occasional cases of isolated ischial or pubic fracture are associated with severe pain, or clients may have concerns about cosmesis or athletic function and pelvic ring collapse that are indications for surgical stabilization. some pubic fractures may need stabilization in association with traumatic ventral abdominal hernia repair. the pubis is either fractured indirectly when the pelvis is grossly deformed, or as a consequence of a ventrally directed force. its cranial ramus, being the weakest point of the pelvis in mechanical terms, is the element to yield most often. not infrequently, two adjacent fractures create a free bone segment. pelvic floor fractures may prevent the closing together of pelvic limbs. an adult native dog with history of trauma was referred. on clinical examination, severe lameness(grade4) was observed in the left pelvic limb. on rectal examination, the pelvis had a partial collapse that predisposed the patient to constipation. to evaluate pelvic injury, two orthogonal radiographs were taken from the pelvis and the fractures of left pubic and ischial ramus and partial subsequent pelvic collapse were confirmed. in this patient, due to the relative collapse of the pelvis and the instability of the left pelvic-femoral joint following this type of fracture, the decision was made to have surgery. the patient underwent general anesthesia and in addition epidural anesthesia was used simultaneously. through the ventral approach to the pelvis, the fracture site of the pubic bone was exposed, and after reduction, the pubic bone was stabilized by a contoured dynamic compression plate and the cortical screw. the patient was restricted in postoperative movement and in monthly monitoring up to four months after surgery, the patient's gait and movement returned to normal and partial pelvic collapse had resolved.

keywords: dog, pelvis, fracture, pubis





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### **Corrective Osteotomy In A Dsh Cat For The Treatment Of Malunion And Multiplanar Deformity Of Radius And Ulna**

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A malunion occurs when a fractured bone heals in an abnormal position, which can lead to impaired function of the bone or limb and make it look like it is 'bent'. If the patient is unable to move because of malunion, or there is a possibility of pain and osteoarthritis, patient needs to be treated with corrective osteotomy. A cat was referred to Oxygen Veterinary Hospital with severe lameness on left forelimb, which could not use its limb properly. On clinical examination, there was severe deviation and torsion of the radius and ulna bones of the left side. Orthogonal radiographic views revealed an old malunion fracture of left radius and ulna bones. After measuring the deviation and pre-surgery planning, corrective osteotomy was performed. A lateral approach to the malunion site performed. A wedge removed to correct 30 degrees



of angulation and bones were aligned and a plate applied on radius. Cast applied for 4 weeks after the surgery. In the first 6 weeks healing was progressed normally but after 73 days, acceptable callus formed in the cranial fracture line in the third distal radius but the caudal cortex radius fracture showed no signs of callus formation. An autograft harvested from proximal humerus applied to the caudal cortex of radius. And daily physiotherapy started and leash-walking was done more intensively. Complete recovery was observed after 107 days. A 5 months follow-up, it showed that patient was able to move normally with complete union. An understanding of the principles of fracture repair is critical to the successful treatment of fractures in dogs and cats. In corrective osteotomy cases, cause of postoperative complications, the recovery period may be prolonged.

Keywords: Corrective Osteotomy-Osteoarthritis-Autograft-Malunion

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## **Report Of Surgical Correction Of Comminuted Fracture In Humerus Of Golden Jackal (*Canis Aureus*, Linnaeus 1758) By Intramedullary Pinning, Cerclage Wire, And External Coaptation**

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On 17 November 2019, two years old and 12kg male golden jackal (*Canis aureus*, Linnaeus 1758) was referred to the Hospital with the history of getting stuck in a metal fence, swelling in left forelimb was clear. In the clinical examination of the left humerus, crepitus sounds distinguished. Diagnostic imaging radiographs in two orthogonal views showed a comminuted fracture in the diaphysis of the humerus.



Stabilizing the patient's condition and preparing the patient for surgery were performed. The catheter was then inserted into the cephalic vein and fluid therapy was performed with Ringer's lactate solution (10ml/kg/hr.) then the sedation and induction of anesthesia were co-administered with Xylazine (0.5 mg/kg) and Ketamine (7 mg/kg) respectively (McKenzie and Burroughs, 1995). Maintenance continued by isoflurane inhalation gas (Drager Fabius Tiro, Germany) after intubation. The animal was placed in right lateral recumbency in such a way that the injured hand was stretched and hung and the surgical site was aseptically prepared. Because of the fracture position and the number of fragments craniolateral approach was selected. After exposure of the humerus, the technique of intramedullary Steinmann pin size 4 was inserted by the retrograde technique in medullary space. The distal insertion is performed caudomedially to anchor in the medial condyle of the humerus after bone reduction. Three cerclage wire gauge 20 twisted around replaced fragments. The muscles, subcutaneous, and the skin are sutured by Vicryl plus 2-0, 3-0, and Nylon 2-0, respectively. After the surgical process, the limb was splinted with a fiberglass cast and restricted in a standard cage, and fed with raw food and free access to water. Anti-inflammatory include Meloxicam tablets (0.1mg/kg PO, Q3d) and analgesic include Tramadol injection (1mg/kg IM, Qod), antibiotics Ceftriaxone injection (30mg/kg, Q1w) and Clindamycin injection (11mg/kg, Q3d). Radiographic evaluation is performed every two weeks after surgery. IM pin was removed after 4weeks, but the external coaptation was replaced every week for 6 weeks. The jackal gets free after 6 weeks and gets back to the mother of nature.

Key words: Golden jackal, humerus, comminuted, fracture, intramedullary pin

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## **Application Of Acrylic Bone Plates In Canine Tibial Fractures**

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Repairing bone fractures using bone plates is a successful and standard technique. On the other hand, the stability of orthopedic devices depends in part on quantity and quality of the bone.

The use of acrylic plates is less painful, lighter, and less expensive than metal bone plates due to

similarity of the longitudinal and volumetric expansion index between acrylic and bone

compared to metal. In this study, 5 native male dogs of same age and weight were selected.

After surgical preparation, a transverse cut made in the middle of the tibial shaft by gigli wire,

then a 5-hole acrylic bone plate inserted. Acrylic is not a suitable alternative to metal bone plates

due to its fragility and intolerance to pressure caused by surgical instruments and animal weight.



In all of cases acrylic plates failed to stabilized bone due to excessive fragility against tool pressure and weight, even in conjunction with cast as an external support after surgery.

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## **Preliminary Evaluation Of Gait Patterns In Dogs**

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Dogs experience a variety of gait patterns based on their particular breed, size, and function. The gait pattern (three limbs on the ground and one limb in motion) is the most common pattern, although in some breeds the pattern of gait is recorded as crosswise in one direction. The aim of this study was a preliminary study of the kinematic gait patterns in native Iranian dogs.

This study based on lateral view videoing of walking dogs. A total of 31 native dogs were selected and video taken from the lateral angle of  $90^\circ$  (P) and the lateral angle of more or less than  $90^\circ$  (N). The number of limbs separated from the ground, the order of separation,



cross separation, unilateral separation, limb placement (track up) were determined and the distance of two ipsilateral limbs to the size of the metatarsus, the distance of two contra-lateral limbs to the size of the metatarsus was measured. In 83.3% of heavy dogs, only one limb was lifted off the ground at a slow pace, and the other three limbs were on the ground. This number increased to 40% as the speed of the animal increased. Only in 16.6% limbs of heavy dogs at low speed track up were correct and in 50% rear limb landed in front and in 33% landed behind forelimbs. In one case, track up of right and left limbs were different although clinically no lameness was observed in this animal. The distance of ipsilateral limbs based on gait speed were varied between 5.7 to 9.6 times of the metatarsus length that is increased by gait speed. Differences in distance between right and left limbs were observed.

The findings of this study show that in cases of mild lameness, kinematic studies of the animal can be used, and since the dog breeds are very different and this difference creates certain characteristics, it is not possible to use standard numbers such as step length or placement etc. The best way is to compare a standard size in the animal body such as the size of the metatarsus or metacarpus or to compare size and distances between the right and left limbs.

Key words: Dog, Gait, Kinematic, Walk

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## **Femoral Head Avascular Necrosis As A Late Complication Of Osteomyelitis Of The Intertrochanteric Region; A Case Report**

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A 2-year-old male Pit-bull dog (22 kg) with a history of acute left hind-limb stiffness was referred to the Veterinary Teaching Hospital of Shiraz University. The owner reported that the patient had an orthopedic surgery on the mentioned limb exactly one year ago. He said that about 40 days after its patient surgery, intramedullary pin had moved proximally and infection (osteomyelitis) was occurred which purulent fluid was venting from femur proximity. The patient received ceftriaxone (30 mg/kg, Daana Pharma Co., Iran) for seven days due to infection. Two weeks later, the pin was removed from bone cavity. The owner reported that the dog did not show any abnormality during this year. Physical examinations revealed crepitus sound on his left coxofemoral joint. In radiographic images, severe degenerative processes (osteogenesis and osteolysis) were seen in proximal extremity of left femoral bone and left acetabulum cavity in all edges. Femoral head and neck were not been detected appropriately. Fracture borders were not seen in old traumatic injury in distal part of shaft of left femur and organized callus formation was detected. Surgical trauma, vascular changes, and mechanical impedance to normal femoral neck growth caused by the presence of an intramedullary pin, are all considered as possible etiologic factors contributing to the bony changes; these changes include coxa valga, short narrow femoral neck, small femoral head, subluxation of the femoral head, and premature closure of the greater trochanter epiphysis [1]. In current case, avascular necrosis of femoral head (Legg-Perthes disease) was obviously observed which is due to presence of intramedullary pin and specially incidence of osteomyelitis because literature review emphasized the danger of avascular necrosis of the capital femoral epiphysis arising as a late complication of osteomyelitis of the intertrochanteric region [2]. We believe that awareness of this hazard should prompt the surgeon to be aggressive in the management of infection in this situation.

Keywords: avascular necrosis, osteomyelitis, dog, Legg-Perthes disease

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## **Investigation of the effect of estrogen (17- $\beta$ estradiol) on reconstruction of anterior cruciate ligament rupture in rabbits by mesenchymal stem cells**

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Anterior cruciate ligament injury is one of the most frequent sports injuries in humans and one of the most important causes of lameness in dogs. Anterior cruciate ligament injury results in pain, swelling and knee instability and without timely therapeutic intervention, subsequently causes osteoarthritis. According to the limitations of anterior cruciate ligament reconstruction, application of biological treatment such as mesenchymal stem cells is increasing. There are various types of stem cells such as embryonic, induced pluripotent and mesenchymal stem cell. Among these, mesenchymal stem cells are most widely investigated. Estrogen has variety of roles in integrity of anterior cruciate ligament. The purpose of this study was to evaluation of the estradiol effect on mesenchymal stem cells in healing of experimentally induced cranial cruciate ligament injury.

Twenty-four mature male rabbits were neutered, then the anterior cruciate ligaments were transected partially. After 1 week the rabbits were randomly divided into 4: the control group, stem cell group, 17- $\beta$  estradiol group and stem cell and 17- $\beta$  estradiol group. The rabbits received 500  $\mu$ l intracapsular injection of one to the following: (1) PBS only, (2) 106 MSCs in PBS, (3) 10-4 molar 17- $\beta$  estradiol in PBS or (4) 10-4 molar 17- $\beta$  estradiol and 106 MSCs in PBS. Histological evaluation





of cellularity, cell morphology, collagen arrangement, vascularity and ground substance of the ligaments has been done at 7 weeks after transection. The anterior cruciate ligaments were evaluated using modified Bonar's scale. The best result has been observed in the mesenchymal stem cells group compared with other groups. Because of interaction with collagen synthesis 17- $\beta$  estradiol is not recommended.

Key words: anterior cruciate ligament, stem cell, 17- $\beta$  estradiol

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### **Stabilization Of Fracture- Luxation of L7 With Polymethyl Methacrylate and Cortical Screw in Two Dogs**

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lumbosacral lesions constitute 39% of vertebral lesions and are the second area after the thoracolumbar region with the most fractures and luxation. The most commonly reported signs of plegia, sciatica nerve involvement, urinary and fecal incontinence, and severe back lumbar pain. Two 2-year-old adult native dogs with signs of acute hindlimb paraplegia and left forearm swelling following a car accident were referred. preliminary examination revealed that in both cases, the close complete fractures of left radius and ulna. also in hindlimbs, superficial pain test, deep pain test, anal sphincter tone, patellar reflex were all positive but the patients showed complete hindlimbs paraplegia and were unable to weight bearing on the hind limbs. Two orthogonal radiographs were taken to accurately assess damage to the thoracic and lumbar vertebrae and radius and ulna fractures. lateral radiograph showed acute fracture-luxation of the L7 compared to the sacrum and did not show lateral deviation in the ventrodorsal view. in both cases, complete transverse fractures of the radial and ulnar shaft of the left bone were confirmed. in both cases, the L7 and the sacrum were exposed from the dorsal approach and after reduction of the fractured vertebra, which was displaced downwards, six cortical screws were inserted into the pedicle of the L7 and the sacrum and in the reduced position, PMMA was placed in position as the connecting rod of the screws. postoperative radiograph showed complete reduction and proper stabilization between the L7 and the sacrum. in both cases, the radius bone was fixed with orthopedic screws and plates. the first case, two days after surgery and the second case, seven days after surgery, were able to weigh bearing on the hindlimb and move. fractures of the L7, despite performing different surgical techniques, have a good prognosis in the long time and improve nerve damage.

key words: Fracture stabilization, Seventh lumbar vertebrae, dog



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## **Surgical Treatment Of Locked Jaw Syndrome In A Dsh Cat**

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The temporomandibular joint is a condylar joint that allows considerable sliding movement. Diseases affecting the temporomandibular joint (TMJ) and masticatory muscles have been reported in dogs and cats and may lead to severe mastication dysfunction. The inability to open or close the mouth is known as locked jaw syndrome. TMJ ankylosis and trismus may constitute potential causes of locked jaw syndrome. Additional potential causes of locked jaw syndrome are masticatory muscle myositis, trigeminal nerve paralysis and central neurological lesions, temporomandibular joint luxation and dysplasia, osteoarthritis, retrobulbar abscess, tetanus, and severe ear disease. Ankylosis is defined as an abnormal immobility and consolidation of a joint. Ankylosis may be secondary to bony and/or fibrous callus formation between fractured bones and masticatory muscles, preventing normal jaw movement. Other potential causes of TMJ ankylosis include neoplasia and infection. In cats, TMJ injury is usually associated with vehicular trauma or falls. Cats are less prone to ankylosis caused



by zygomatic fractures due to the wide curvature of the felid zygomatic arch. Early recognition and aggressive treatment are important to prevent irreversible jaw dysfunction and severe muscle atrophy. Surgical intervention is recommended for ankylosis of the TMJ. In this report, a 6-month-old male DSH cat was presented with close-mouth jaw locking. The patient had a locked jaw since two months old due to a fracture of the mandibular bone and was fed with liquids and soft food for 4 months. After tests and radiography it was an excessively old callus formation between the skull, mandibular ramus, and zygomatic arch. The patient was under general anaesthesia but was severely under respiratory distress and suffered shortness of breath for 2 minutes, also due to Aspiration pneumonia caused by lock jaw it was not possible to intubation. After a temporary tracheostomy and the natural breathing process returned, the surgical procedure was started and the old callus between the lower jaw and the zygomatic arc and the cranium bone removed. After the surgery, the patient's jaw was functioning properly and the patient was able to eating.

Key words:

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## **Effect Of Dexpanthenol On Stability Of Colonic Anastomosis Following Experimental Peritonitis In Rat**

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One of the most important post-surgical complications in the colorectal surgeries is the anastomotic leakages. After surgery, because of the increased collagenase activity at the site of injury, the anastomosis is very weak. The effect of Dexpanthenol by stimulating epithelialization, migration, proliferation and regulation of fibroblast genes and antioxidant properties has been well established. The aim of this study was to evaluate the effect of intraperitoneal administration of Dexpanthenol (500 mg/kg) intraperitoneally for five days, on the histopathological and biomechanical characteristics of the colon following its anastomotic surgery in peritonitis. Thirty-five male mature Wistar rats were randomly divided into 5 groups (No=7 rats in each group). In group one, only intraperitoneal administration of normal saline, group two only intraperitoneal administration of dexpanthenol, group three intraperitoneal administration of Dexpanthenol under anastomotic surgery, group four intraperitoneal administration of Dexpanthenol under anastomotic surgery in peritonitis and group five under anastomotic surgery in peritonitis were exposed. For peritonitis induction, the cecum was ligated and perforated with a needle gauge 19. The next day, the cecum was removed and the descending colon was incised and anastomosed. After 5 day post-surgery, the animals were euthanized and immediately tested for the bursting pressure and biomechanical. Trichromason and Hematoxylin-eosin staining was used for histopathological evaluation. Necropsy findings illustrated that the leakage and adhesion score in groups three and four were significantly reduced. The mean bursting pressure in groups three and four was higher than group five and the difference was significant ( $P<0.05$ ). The mean score of collagen deposition in granulation tissue in groups three and four increased compared to group five and the difference was significant ( $P<0.05$ ). Histopathological examination exhibited that the penetration of neutrophils, macrophages and lymphocytes in the treated groups was significantly reduced. The number of adult fibroblasts and the rate of angiogenesis were significantly increased in the treated groups compared to group five. The amount of hydroxyproline in the treated groups was significantly increased compared to group five ( $P<0.05$ ). Intraperitoneal administration of Dexpanthenol can increase tissue resistance, improve wound healing and biomechanical parameters of colon anastomosis, especially in inflammatory phases and acute peritonitis conditions in



rats.

**Key Words:** Colon, Dexpanthenol, Tissue strength, Anaesthesia, Peritonitis, Rat

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## **Management of extensive skin wound due to pelvic contusion and laceration in Spitz\_Pomranian dog**

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The skin is the largest organ in the body and performs a variety of vital functions including protecting the body against physical and chemical damage, preventing excessive water loss and regulating temperature. Due to the location of the skin and its contact with external surfaces, it is frequently exposed to harmful agents. Damage to the integrity of biological tissues including the skin, mucous membranes and organs of the body, is known as wound and there are different categories depending on the type of wounds. Immediately after the injury, the wound healing process begin. Wound care is expensive and costs about 28.1



billion dollar annually. Following the involvement of a male Spitz-Pomeranian dog, approximately 4.5 years old, with a stray dog outdoors, a large proportion of skin contusion were observed in the pelvic area. Initial procedures (rabies vaccine, serum therapy and cefazolin injection) were performed at another treatment center and unfortunately a large portion of the affected area was mistakenly removed and the case was eventually referred. Immediately after referral, the affected site is examined and according to its type, the medication regimen (cefazolin at a dose of 20 mg/kg every 12 hours), Ringer serum, phenytoin ointment and wound wash twice a day and over time for three days performed, the condition worsened and no changes in the treatment process were observed. Due to the size of the wound and the infection at the site of injury, the injection of antibiotics was changed several times over a period of two weeks and no healing process was observed in the case. Finally from the drainage system, vancomycin antibiotic (15 mg/kg slowly and intravenously with saline, about 30 minutes), serum therapy, wound washing three times a day, using a combination of ointments (phenytoin, zinc oxide, honey and silver alginate) and wound dressing obtained the desired result. In the mentioned case, the process of descriptive wound healing was done continuously for about 75 days and a very good result was obtained. The clinical importance in these cases is wound healing bags depending on the (type of injury, place and time of the complication, choosing the right treatment method and complete coverage of the healing process).

Keyword: skin, wound healing, dog

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## **The effects of Ethyl pyruvate on saving the zone of stasis in rat burn**

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Burn are one of the most important injuries that affects of living species. These injuries can be classified in three concentric zone based on the severity of destruction and blood flow alterations from the outermost to inner part; zone of hyperemia, zone of stasis and zone of coagulation. From the aforementioned zones, stasis zone could play a vital role in saving the wound from progression to necrotic burn. Ethyl pyruvate is reported to has a anti-inflammatory, antifibrotic, antioxidant and anti-apoptotic effect which we hypothesed to enhance burn wound healing in rats. In this study 30 male wistar rats weight between 300-400 grams were randomly assigned in three groups. The first group[CONTROL] received single intraperitoneal injection of equivalent volume of Normal Saline solution (0.9%). Second group received ethyl pyruvate diluted with Ringer solution (40 mg/kg, IP) 0.5, 12, 24, 36, 48, 60 and 72 hours post injury. Third group treated with single dose of ethyl pyruvate (40 mg/kg, IP) 30 minutes post thermal injury. burn wounds were created by putting heated Burn comb on the dorsum of each rat and the effects of ethyl pyruvate on the skin and burn wounds was evaluated. Half of the rat were euthanized on 3rd day and the other half on 21th day post injury. In order to evaluate histopathological indices, all tissue samples were stained by hematoxylin, eosin and Masson trichrome. Immunohistochemistry tissue samples were also stained. five indices of tissue repair (epithelium regeneration, angiogenesis, inflammation, collagen formation and Fibrocytes) and two indices of immunohistochemistry (Bcl-2 and P53) were scored respectively and analyzed through statistical tests. For biochemical studies, total antioxidant capacity (TAC), Malondialdehyde (MDA) and hydroxyproline (HP) indicators measured using commercial kits. Data were analysed using





SPSS software. Analytical comparison for histopathological, immunohistochemistry indices performed via Kruskal-Wallis test. Biochemical indices analyzed via ANOVA test. Statistical Significance level was set to  $P < 0.05$ . The results demonstrated that ethyl pyruvate significantly reduced inflammation, fibrosis and angiogenesis and ameliorated the epithelial regeneration mainly but its HMGB1 inhibiting effect in stasis zone. Moreover, it was shown that ethyl pyruvate considerably controlled oxidative stress but no marked changes observed in immunohistochemical markers. Finally, this study demonstrated that injection of ethyl pyruvate could prevent progressive tissue necrosis in the zone of stasis and enhances wound healings mainly by its anti-inflammatory, antioxidative characteristics.

**Keywords:** Burn wounds, Ethyl pyruvate, Stasis zone, Burn comb model

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## **Evaluation of the effect of topical application of tadalafil with scaffolding in bone healing**

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Bone healing is still one of the most challenging aspects of oral and maxillofacial surgery. The goal of this study was to see how topically administered Tadalafil (a drug used to treat erectile dysfunction) affected bone defect repair in an experimental animal model. Twelve New Zealand white rabbits weighing between 2900 and 3500 grams were subjected to three standard 8 mm calvarial bone perforations. B-TCP and a combination of B-TCP and Tadalafil were used to plug two perforations. The third cavity, which had no material, was employed as a control. A regular laboratory diet was used to feed all of the rabbits. Six rabbits from each group were killed after four and six weeks, and bone repair was assessed using radiographic, histologic, and other methods. In comparison to the control group, the Tadalafil group showed 34.57 percent and 82.32 percent bone development in histomorphometric analyses after 4 and 6 weeks, respectively, while the scaffold group showed no significant changes. Significant radiographic and histological differences were seen between the Tadalafil and control groups. This study found that using Tadalafil in combination with a scaffold can speed up fracture healing by improving osseous tissue production. Keywords: Tadalafil, B-TCP, Bone healing  
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## **The evaluation of synthesized collagen/Bioglass scaffold in bone healing**

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In dentistry and orthopedics, finding an appropriate scaffold that can offer the greatest outcomes in enhancing bone transplant quality has long been a primary priority. Several studies have demonstrated that materials containing bioactive glass (BG), as well as bioactive glasses replaced with strontium, can promote bone formation and inhibit resorption by osteoclasts. The goal of this study was to see how collagen/bioglass scaffolds containing strontium affected bone repair. The effect of strontium substitution in the structure of collagen bioactive glass on bone healing in critical lesions generated in the rabbit skull and femur was investigated in this work. Three crucial lesions with a diameter of 8 mm were generated in each animal's skull (36 rabbits), and the wounds were filled with scaffolds comprising collagen bioactive glass (BG) and 2 As a control, one lesion was left without scaffolding. The femur underwent the same surgery. The rabbits were separated into three groups, each receiving a different type of scaffold, with the third group serving as a control. Finally, using Hematoxylin/Eosin, Masson's Trichrome, and Alizarin Red staining, in vivo testing and evaluations of bone regeneration and mineralization were performed at 4, 8 and 12 weeks after scaffolds implantation. The quantity of degradability, water absorption, and porosity in BG-Sr samples were dramatically reduced, according to the findings. The scaffolds created were non-toxic and encouraged and accelerated cell growth. On day 14, ALP activity was greater than on day 7, and BG-Sr samples had the greatest calcium concentration. The findings of the DAPI test were consistent with those of the SEM and MTT tests, indicating that cell growth was verified. The BG-Sr group had high levels of osteocalcin and ALP gene expression, and histological studies revealed that BG-Sr scaffolds had a lot of bone production. BG-Sr scaffolds can improve bone regeneration and are an excellent choice for bone tissue engineering.

**Keywords:** Scaffold, Bioglass, collagen, bone healing

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## Analyzing the effect of tadalafil enriched PCL suture on skin and wound healing

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The skin was once thought to be the body's biggest organ, as it covered the whole outside surface of the body. Skin protects the body from environmental influences and external threats as a protective barrier. The goal of surgical research is to improve the healing process of tissues. Sutures are used to seal surgical wounds and are composed of biocompatible materials. They can also be utilized to deliver medications to the surgical site directly. In this work, a new Polycaprolactone suture was coupled with Tadalafil to promote wound healing processes by vascular stimulation. Electrospinning was used to create polycaprolactone (PCL)/Tadalafil sutures. SEM, mechanical property assessments, tensile strength tests, and drug release investigations were employed to evaluate the suture. Rats were placed into two groups for in vivo experiments. Their back skin was incised and TP and Polycaprolactone sutures were used to close the wound. Rats were slaughtered 7 days following surgery for histological investigations using hematoxylin and eosin staining. The lowest tensile strength of TP suture was 3 and 4 percent wt, while the greatest tensile strength was 1 and 2 percent wt, according to tensile test findings. The maximum drug release was



associated to 3 and 4 percent wt, which were roughly 125 to 210 g over 15 days, according to the rate of Tadalafil release. During the 7-day period, the number of blood vessels, collagen fibers, fibroblasts, polymorphonuclear leukocytes, and epithelization was significantly higher in the Tadalafil/Polycaprolactone group. A new Tadalafil/PCL suture that releases the Tadalafil medicine surrounding the sutured wound enhanced wound healing and can be employed in medical applications.

**Keywords:** wound healing, Tadalafil, PCL

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## **Histopathological Study Of Collagen / Nano-Clay Hydrogel/ Tadalafil In Wound Healing Under Hiit Exercise**

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The skin, the body's biggest organ, is essentially a protective covering that covers the whole outer surface of the body. The effect of a hydrogel comprising collagen, Tadalafil, and nanoclay on the full wound healing of diabetic rats was examined in this work. Thirty-six male rats (7 to 8 weeks old) were employed in animal testing with an 8 mm puncture, divided into four groups: control, HIIT exercise, hydrogel, and HITT / hydrogel exercise. They were inspected macroscopically and microscopically on days 7, 14, and 21. (Hematoxylin-Eosin and Ma-



son trichrome staining). Macroscopic results demonstrated that wound healing with hydrogel/HITT exercise was faster than other groups over the course of 21 days, and staining tests validated these findings. The findings of this study revealed that hydrogel / HITT exercise can help diabetic rats repair their wounds completely.

**Keywords:** Healing, Diabetic Wound, Rat, Hydrogel, Collagen, Tadalafil, Nanoclay, HITT exercise

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## **The Effects Of Thymoquinone On Treatment Of Tendinitis And Tendon Healing In Rabbits**

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Tendon injuries are almost 50% of all musculoskeletal injuries. The recovery of tendon after surgery has been a significant challenge in



orthopedics. The purpose of this study was to investigate tendinitis and healing effect of thymoquinone (TQ) injection in rabbit tendon traumatic model. Thirty New Zealand Rabbits were used in this study. Animals were randomly divided into 3 groups: Normal saline injection (control), DMSO injection, and Thymoquinone 5%. Thymoquinone and DMSO were injected in tendon at 0 and 3 days after surgery. Healing process evaluated by biomechanics and histopathology. Biomechanical factors in treatment group were significantly higher compared to control and DMSO groups ( $p < 0.05$ ). Edema and hemorrhage in histopathological evaluation was significantly lower in TQ group compared to control and DMSO groups ( $p < 0.05$ ). Collagen fibers, collagen fibers with fibrocyte and collagen fibers with fibroblasts were significantly higher in TQ group compared to other groups ( $p < 0.05$ ). Thymoquinone injection in tendon is a simple and low-cost treatment method that could enhance mechanical and collagen synthesis in tendonitis.

Key words: Thymoquinone, tendinitis, tendon healing, rabbits

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## **Using of Electrical Muscle Stimulation Technique in a German Shepherd Dog with Disuse muscle atrophy**

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Many adjunctive therapies for pain management are based on using energy, such as cryotherapy, laser therapy, ultrasound, and electrical muscle stimulation. The purpose of electrical muscle stimulation is to replace and decrease atrophy by stimulating motor fibers. In April 2022, a 5-year-old German Shepard male dog with a history of surgery for grade 4 patellar luxation, osteoarthritis and pain in weight bearing on his right hind limb was referred to a pet hospital. On clinical examination, atrophy of the quadriceps muscles and pain in the right leg were observed. In order to decrease the pain and increase the muscle mass that support the knee, the technique of Electrical Muscles Stimulation was used. Hairs were clipped and the electrodes were connected to neuromuscular junction area of the quadriceps muscles. Hamstring groups hairs were also clipped simultaneously and electrodes were attached on the distal and proximal part of the biceps muscle. In synchronized mode, a frequency of 25 Hz with pulse duration of 300 microseconds for 5 minutes, the current gradually increased in 4 seconds. The milliamper was gradually increased until contraction was observed. On/Off cycle ratio of 1:3 was used. The dog treated for twice a week for 6 weeks. In the end, the muscle mass of the right leg increased significantly and no pain was observed on examination. The use of this method in cases with disuse muscle atrophy and weakness is recommended in Iranian veterinary clinics because of its relatively low cost and availability.

Keywords: Physical therapy - Electrical Muscle Stimulation - Muscular Atrophy – Dog

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## **Preventing the reduction in serum IL-2, TNF- $\alpha$ and IFN- $\gamma$ levels, by Propranolol as a Non-selective $\beta$ -antagonist in rats under selective surgery**

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In general, surgical operation induces a kind of stress called ‘‘surgical stress’’ that changes the component of immune system. These changes are mostly suppression of immune function, especially cellular immunity. This suppression occurs through the effect of catecholamines and glucocorticoids on immune components. In this study, by targeting catecholamines and inhibiting their engagement to receptor, the hematological parameters and serum cytokine levels (IL-2, IFN- $\gamma$  and TNF- $\alpha$ ) were evaluated. Forty-five 4-month old male rats were purchased and divided equally into three groups. Laparotomy was performed as a minor surgery in all rats. Propofol (100mg/kg) and midazolam (3mg/kg) were used for anesthetizing the animals. In groups P4 (4mg/kg propranolol) and P8 (8mg/kg propranolol), propranolol was administered with 4 and 8 mg/kg body weight respectively by subcutaneous injection one hour prior to surgery. In controls (Ctrl group) same volume of normal saline was injected. In each sampling time (before surgery, immediately after surgery, 6h, 24h and 3 days after surgery) three rats were anesthetized by the same anesthetic drugs and blood were taken directly from the heart. Increased total WBC was seen in every three group 6h after the surgery, however, lymphocyte number



was reduced at this time. Results showed that propranolol was unable to attenuate this reduction. Reduction in serum level of IL-2 was seen in groups Ctrl and P8, 6h after surgery, but this reduction in group P4 occurred 24h after the surgery. Increased level of TNF- $\alpha$  was seen in Ctrl and P4 groups, but was not seen in P8 group. Inhibition of TNF- $\alpha$  in pro-inflammatory phase after the surgery in group P8, led to post-operative infection. Results showed that changes in IFN- $\gamma$  levels was not affected by propranolol administration. Propranolol under special circumstances can enhance immune system against surgical stress. In balanced concentrations, it prevents suppression of the immune system after surgery, while high levels completely suppress the production of TNF- $\alpha$  by macrophages in the pre-inflammatory phase.

Keyword: IL-2, TNF- $\alpha$ , IFN- $\gamma$ , surgical stress, ELISA

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## **Splenic Hemorrhage, Splenectomy- Etiology and Macroscopic Findings**

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Splenomegaly and splenic tumors are common in companion animals, especially in dogs. Determination of the underlying cause affects treatment and prognosis. Primary splenic tumors arise from vascular and mesenchymal tissues. Splenic hematoma, one of the frequently submitted lesions to histopathology service, is common in dogs and rare in other species. Trauma, hematopoietic and lymphoid nodular hyperplasia, amyloidosis, and infection are the well-established underlying causes of splenic hemorrhage and hematoma. Meanwhile, hemangiosarcoma, the most important cause of splenic hematoma, sometimes leads to hemobdomen. Splenic hematoma can also be idiopathic. Idiopathic and nodular hyperplasia-induced hematomas have the best prognosis. Here we present histopathologic findings of 12 cases of referral splenic hematomas from 9 dogs and 3 cats. The cats were DSH and 3 to 8 years old, and the dogs were of German Shepherd, Terrier, Golden Retriever, and Husky breeds, and 5 to 9 years old. Some patients were asymptomatic and some presented with nonspecific symptoms such as progressive anemia, lethargy, and nausea. Except in two cases, the splenic masses were observed on ultrasound (sometimes as incidental findings). Following splenectomy, the specimens were either subsampled by the surgeons, or the spleen was entirely submitted. Histopathologic and immunohistochemical examinations followed the gross inspection. The specimens were carefully inspected for the underlying cause. Histopathologically, hemangiosarcoma was diagnosed in 1 cat and 2 dogs, and lymphoid nodular hyperplasia (sometimes mixed with hematopoietic hyperplasia) was observed in 5 dogs as the etiology of splenic hemorrhages. Attempts to diagnose the etiology were unsuccessful in 4 cases due to lack of complete history or insufficient amount of referred tissue. Splenomegaly was noted in all entirely submitted spleens, and macroscopic features of such spleens will be described. The case of feline hemangiosarcoma presented as 3 coalescing cream-red hemorrhagic nodules measuring 3.5\*3\*3cm. Lymphoid nodular hyperplasia appeared as single or double whitish nodules with a mottled cut surface, approximately measuring 1.5\*1.2\*1cm. In all cases, blood-oozing cut surfaces were prominent. In one case, a large bulging hematoma was presented 11cm in diameter, containing clotted and unclotted blood. In



our series, death occurred within two months post-surgery in patients with hemangiosarcoma. Collaboration between surgeons, radiologists, and pathologists, and pathology-supported clinical decision-making substantially improve treatment strategies. It is recommended that the entire spleen is submitted; providing the opportunity for precise gross inspection and subsampling of adequate sections by the pathologist.

Keywords: Hemorrhage, Spleen, Splenomegaly, Splenectomy, Surgical pathology

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## **Evaluation Of Hematological, Biochemical And Oxidative Stress Alteration In Lamb With Atresia Ani Defect**

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Anal atresia is one of the most common congenital anomalies among livestock animals that occurs during embryological development process due to genetic or environmental factors, or a combination of both; but the exact cause is poorly understood. This anomaly is characterized by persistence of the anal membrane over normal anal opening that usually leads to straining, tenesmus, colic, depression and anorexia with abdominal distention. In this condition meconium would be stuck in the body and its content may be released slowly into the bloodstream. As a result, there could be an alteration in hematobiochemical parameters, inflammatory parameters and oxidative imbalance in the blood profile of neonates. A total of 34 male lambs which were referred to Lorestan University Veterinary Hospital with presenting complaint of abdominal distention and lack of defecation in the period of 24 to 72 hours after birth. Another 34 healthy male lambs from the same herd assigned for control group. Samples containing anticoagulants and those without anticoagulants were taken from all 68 lambs. Hematological factors, total protein, albumin, globulin, A:G ratio, CRP (C-reactive protein), Urea and oxidative stress factors (SOD and MDA) were also measured. Data were evaluated and analyzed and significance level was set to  $p < 0.05$ . The surgical correction of anal atresia was performed afterwards. The results demonstrated considerable differences in most parameters. Inflammatory parameters (CRP and fibrinogen) were higher as expected in the atresia group, and oxidative parameters showed significant oxidative changes. Congenital anal atresia is a fatal condition in animals that results in autointoxication, oxidative stress and death within few days if not treated. However, with proper medical intervention these lambs could survive and gain sufficient weight.

**Keywords:** Anal atresia, oxidative stress, congenital anomaly, lamb

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## **Histopathologic Diagnosis Of Gingival Lesions Removed By Gingivectomy- A Report Of 12 Cases**

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Gingival lesions in cats are mainly divided into 3 categories; inflammatory, proliferative, and neoplastic. Lymphoplasmacytic stomatitis, feline gingivostomatitis, suppurative gingivitis, and oral eosinophilic granuloma complex are inflammatory lesions. Squamous cell carcinoma (SCC), fibrosarcoma, melanoma, lymphoma, hemangiosarcoma, mast cell tumor, and myxosarcoma are the common neoplastic lesions in the gingiva. The aim of this report is to present histopathological findings of gingival lesions in cats. Gingivectomy was performed in 12 cats of Himalayan, Scottish fold, Persian and Domestic shorthair (DSH) breeds, from 1 to 11 years of age. Suspicious masses were presented in the maxilla and mandible, lingual and buccal or labial gingival surfaces of incisor, canine, and molar teeth. Referred cats were presented with symptoms such as dysphagia, halitosis, ptyalism, facial asymmetry, anorexia, and weight loss. The specimens were referred to the Department of Pathology, Faculty of Veterinary Medicine, Uni-



versity of Tehran. In gross and microscopic examinations, ulceration was evident in all specimens. Upon histopathological examination, chronic gingivostomatitis, suppurative gingivitis, feline herpesvirus (FHV), or feline calicivirus (FCV) infection, eosinophilic granuloma complex, ossifying ameloblastoma, squamous cell carcinoma, fibromatosis, and fibrosarcoma were diagnosed in the patients. Necrosis of the epithelial tissue, hydropic degeneration, pustule formation, lymphoplasmacytic infiltration, granulation tissue formation, and hyperemia were observed in chronic gingivostomatitis and suppurative gingivitis. In some cases, the presence of intranuclear inclusion bodies within the epithelium indicated feline herpesvirus infection. Infiltration of eosinophils, presence of macrophages and multinucleated giant cells, diffuse necrosis, and edema indicated feline eosinophilic granuloma complex. Malignant transformation and progression, from fibromatosis into a well-differentiated fibrosarcoma (Grade 1) were seen in one patient as the mass recurred for three times. In that case, unremarkable mitotic activity, moderate pleomorphism, neovascularization, and mild epithelial hyperplasia, indicated a fibrosarcoma. Immunohistochemistry ( $\beta$ -catenin, S100, TLE1, SMA, CK, and Ki-67) was used to differentiate and confirm the diagnosis. Lesions of the oral cavity of cats are one of the most common reasons for owners to seek veterinary care. Due to the wide spectrum of lesions and their macroscopic similarity (inflammation and ulceration), histopathology is the diagnostic gold standard that provides a precise prognosis. Differences in treatment protocols for neoplastic, proliferative, and inflammatory lesions, along with the consequences of leaving such lesions untreated (invasion, extensive damage to bone and dental tissues, etc.), indicate the necessity for biopsy and pathologic inspection.

Keywords: Cat, Gingiva, Gingivectomy, Inflammation, Neoplasia, Histopathology

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## **Von Meyenburg Complex- First Report of Two Cases in Iran**

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Developmental lesions of the liver may appear as cystic structures, diagnosed by ultrasonography or as an incidental finding during laparotomy or necropsy. Differential diagnosis of hepatic cystic lesions can be achieved by histopathology. Von Meyenburg complex (biliary hamartoma, polycystic liver disease) is a congenital developmental lesion appearing as multilocular cystic structures bulging from the liver surface. In Persian cats or Persian-cross cats, this abnormality may be accompanied by polycystic kidney disease (PKD) and pancreatic cysts, indicating the role of mutation of the PKD1 gene. Here we present macroscopic and microscopic features of Von Meyenburg complex in a cat and a dog. The first patient is an asymptomatic six-year-old female Persian cat suffering from PKD, diagnosed with focal cyst-like hepatic lesions by ultrasonography in 2020. Following gradual distention of the cysts, the patient underwent lobectomy. The second patient is a 12-year-old Shih Tzu-Terrier with cyst-like lesions of the quadrate lobe diagnosed by ultrasonography and CT scan. The patient underwent lobectomy of the quadrate lobe. The excised tissues were entirely submitted for pathology. Macroscopically, both specimens were composed





of multilocular fluid-filled (occasionally blood-filled) cysts extending from the subcapsular area into the parenchyma, with the largest cyst measuring 5mm in diameter. Upon histopathology, multiple variably sized cystic structures were seen lined by low columnar, cuboidal, or flattened epithelium, lacking dysplastic or malignant changes. A fine fibrous tissue was noted separating the cysts. Mild diffuse bile duct hyperplasia, minimal fibrosis, and mild focal hemorrhage were other histopathologic findings. CK7 immunostaining confirmed biliary origin of the lining epithelium of the cysts. One year after surgery, no postoperative complications and new hepatic lesions are diagnosed in the cat. Meanwhile, the dog died of a splenic hemangiosarcoma without hepatic lesions. Multifocal cystic lesions have also been described in Von Meyenburg complex. Proliferation and secretion of the lining epithelium expand the lesion and distend the cysts; hence this hamartoma is less likely to be diagnosed in neonates.

**Keywords:** Von Meyenburg complex, Dog, Cat, Surgery, Surgical pathology, Immunohistochemistry

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## **Bronchioloalveolar Carcinoma In An 11-Years-Old Persian Cat**

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Primary lung tumors in the cat are considered rare, with adenocarcinomas being the most common primary pulmonary tumor in this species. Adenocarcinomas account for >50% of feline primary pulmonary neoplasms; Less common primary neoplasms include squamous cell carcinoma and adenosquamous carcinoma.

Feline pulmonary tumors have metastatic rates ranging from 76–80%, with a variety of metastatic targets. including skeletal muscle, eyes, and aorta. Analyses of the influence of age revealed that the odds of cats developing an adenoma or adenocarcinoma increased with age. An 11-year-old neutered female cat with severe lethargy dyspnea, open mouth breathing, and cachexia was referred to Kerman Veterinary Hospital. In clinical examination, dyspnea and tachypnea, muffled respiratory sound with 4/6 Heart murmur was noted.

A radiological survey revealed hepatosplenomegaly, interstitial alveolar pattern, and generalized increased opacity of lung lobes. The presence of pleural effusion and two oval shape soft tissue masses, one in the anterior mediastinum adjacent to sternal lymph nodes and the other in the dorsal lobe was reported. In addition, in the laboratory examination, anemia, mild shift to left leucocytosis, and in the biochemical evaluation, elevated creatinine level (4.2), hypokalemia and hyperphosphatemia were seen which resembled chronic renal failure. The emergency critical care was started with oxygen therapy, hydrocortisone, fluid therapy, Aminophylline, and ampicillin- Clindamycin combination therapy. However, due to the unfavorable prognosis and



clinical condition euthanasia was performed with the informed consent of the owner.

In the autopsy, in addition to the two masses reported in radiology in size (2.5-2 cm) in the posterior lobe and mediastinal masses (0.5-1 cm), no distant metastases were observed in adjacent reticuloendothelial tissues.

In histopathological examination, the occurrence of bronchioloalveolar carcinoma was confirmed.

Lung lobectomy is the recommended treatment in patients without metastasis, with an overall median survival time ranging from 11 to 115 days. The caudal lung lobes appear to be more commonly involved.

The treatment of choice for solitary primary pulmonary tumors in cats is wide surgical resection, and median survival times of 12–18 months are reported for cats with completely resected lesions. All cases of feline pulmonary carcinoma's which underwent surgical removal of the primary tumor died of metastasis and the prognosis of primary pulmonary neoplasm is poor, however, the prognosis of the mentioned case has been decreased by the coincidence of heart failure and chronic renal failure. The impact of chemotherapy in cats with primary lung tumors is not well studied, but one cat that received mitoxantrone following a lung lobectomy lived for 3 years after surgery.

Keywords: Bronchioloalveolar carcinoma, cat, Neoplastic disease

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## **Risk of increased ivermectin toxicity during the Covid-19 epidemic: Ivermectin toxicity in two Himalayan cats**

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A 4-month-old Himalayan cat weighing 450 g was referred to a veterinary clinic in Tehran from a cat breeding center with symptoms of imbalance, tremor, sudden recumbency, and salivation. History showed that ivermectin at a dose of 0.5 mg / kg was injected subcutaneously due to suspected skin mite. Clinical examination revealed tachycardia, tachypnea, mydriasis, relatively severe tremor, and mild fever (39.5). The menace response and the pupil light reflex (PLR) were poor. Treatment was performed by intravenous infusion of normal saline 0.9% (30ml/kg/day) and then dextrose (25ml). Lipid infusion (1.5 mg / kg) was also used. The cat recovered relatively well after 1 hour and the menace response and pupil light reflex (PLR) improved. The cat was monitored for one month and the neurological and behavioral symptoms resolved almost completely after 3 weeks. After some time, the client was informed that another Himalayan cat who had been treated with ivermectin at the same time as the previous cat, and the head of the center's medical affairs did not inform him about this. The author believes that due to the severity of the symptoms seen and other occupational issues, the person may not have told the actual dose and prescribed higher doses of ivermectin. There seems to be a risk of overuse of ivermectin not only in animal husbandry centers, but also by dog and cat caregivers. Author believe that the popularity of this drug among veterinarians, along with the publication of recent studies on the effectiveness of ivermectin in the treatment of Covid-19, has created a misconception of this drug among non-specialists. These cases, along with the possibility of over-the-counter ivermectin and its much lower cost than referring to medical centers, increase the arbitrary use of ivermectin and the risk of poisoning with it. It is therefore recom-



mended that public awareness of the non-arbitrary use of ivermectin be increased and that clinicians be aware of the risk of serious ivermectin poisoning in breeds other than Collies dogs.

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### **The Effect Of Intermittent Fasting On The Saving Zone Of Stasis In Rat Burn Wounds**

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Intermittent Fasting (IF) has proved to have various positive effects on life span, diseases, and healing of tissues in rodents. We evaluated the protective effect of fasting in maintaining the ischemic zones in burn wounds. In this study, 20 rats were divided into two groups where the IF rats were deprived of food for three months. Burn wounds were created by burn comb model on the back of all rats. On days 3 and 21 post-burning, five rats in each group were euthanized whereby samples were collected for histopathological, immunohistochemical (Bcl2, P53 and VEGF), and biochemical (MDA, TAC, HP) evaluations. Histopathological analysis revealed epithelial layer and zone of ischemia remained viable in the IF group on day 3. On the 21st day, epithelialization, angiogenesis, inflammatory level, fibrocyte-fibroblast, and collagen density were different in the ischemic and necrotic zones between the control and IF groups ( $P$  Value  $<0.05$ ). There were no statistical differences in Bcl2, P53, VEGF, MDA, TAC, and HP on day 3 between the IF and control groups. Intermittent fasting before burn wounds can reduce tissue damage caused by ischemia and enhance the



viability of cells in zone of stasis. It can also accelerate wound healing by increasing epithelialization and collagen production in the skin and regulating inflammatory responses. This intervention causes better collagen arrangement and angiogenesis in the IF group.

Key words: Intermittent fasting, zone of stasis, burn wound

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## **Report Of Unilateral Left Nephrectomy In Male Persian Cat With Hydronephrosis**

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The kidneys drain liquid metabolic waste (urine) that has been filtered from the bloodstream down to the bladder through ureters. Any agent, such as urinary stones or tumors, that causes obstruction (usually unilateral) in this pathway and urine is unable to leave the kidney, causes the urine return to the pelvis and kidney, which gradually begin to lose function with the accumulation of urine. This is referred to as hydronephrosis. A 3.5 years old male Persian cat with clinical signs of Pollakiuria, Stranguria, Polydipsia, Loss of appetite and abdominal distention referred to Royal Veterinary Polyclinic. After a complete clinical examination, the case was referred for paraclinical examina-



tion for quick diagnosis. Large anechoic cystic lesion in size 3.98cm is detected in caudal pole of left kidney and 3 little stones are seen in size 1.6mm, 2.8mm, 3.1mm in renal pelvis. Mildly enlargement was observed in the right kidney. To evaluate the function of both kidneys, especially the right kidney, urography was performed. Observation of nephrogram and pyelogram phases in the right kidney, which showed good function of the right kidney, but the mentioned phases was not observed in the left kidney. Also, serum creatinine was reported to be 2.8  $\mu\text{mol/lit}$ , which is mildly higher than the normal range (0.9 - 2.1  $\mu\text{mol/lit}$ ). According to the clinical signs and paraclinical findings, the certain diagnosis was left kidney hydronephrosis due to obstruction of the pelvic area by urinary stones. For treatment, a decision was made to emergency nephrectomy. To address the left kidney, a ventral midline abdominal incision is performed from the xiphoid to caudal to the umbilicus. After incision the ventral midline and exposing the left kidney, ligated and cut the blood vessels were identified from renal hilus then ligated and cut the ureter near the urinary bladder and removed along with the kidney. Ventral midline sutured in 3 layers finally. To continue treatment for 5 days to reduce serum creatinine and improve right kidney function, fluid therapy and antibiotic with saline and cefazolin were performed. Two weeks after surgery, it was observed in re-examination of mention case that was returned to normal life and there was no problem with urination.

Keywords: Kidney, Pelvis, Hydronephrosis, Persian cat, Nephrectomy  
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## Report Of Unilateral Ovarian Tumor Removal From The Right Flank Approach In A Mare

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Ovarian granulosa cell tumor (GCT) is a common neoplasm in mares and is one of the causes of infertility and it occurs common unilaterally. An eight-years-old mare with a history of behavioral changes such as aggression, colic-like symptoms, prolonged estrus period with frequent estrus, and infertility in traction and artificial insemination was reported in Fars province. After attending the field and performing rectal examinations by palpation and ultrasonography, the findings showed an increase in size and observation of polycystic ovary on the right side, which is a sign of ovarian tumor, respectively. Surgical removal is regarded as the treatment of choice for GCT. A flank approach was considered for surgery. For this surgery, pre – medication of mare, acepromazine (dose 0.05 mg/kg) and xylazine (dose 1 mg/kg) and then for induction, diazepam (dose 0.04 mg / kg) and Ketamine (dose 2 mg/kg) was used. During surgery, for maintenance a combination of ketamine (1 mg/kg) and xylazine (0.5 mg/kg) was used. Right flank was completely shaved after taking pre – medication and after induction and laying the mare was prepared under aseptic condition for surgery. After making an incision in the area, dislodge the ovarian tumor and ovariectomy of the right side. The size of ovarian tumor after ovariectomy was determined to be 5.2 × 3.7 × 1.5 cm with a weight of 452 g. The mare was recovered immediately after surgery without any problems and 8 grams of ampicillin vials were used for antibiotic therapy after surgery for 4 days every 12 hours. Two months after surgery, the mare returned





to the reproductive cycle and underwent artificial insemination during the second estrus period to increase the chance of fertility, leading to pregnancy.

Keywords: ovarian tumor, mare, GCT, ovariectomy, estrus

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## Report Of Poll Evil In A Turkmen Horse

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It is an eminence between the ears and occipital that indicates where the vertebrae connect to the skull, at the dorsocaudal of this eminence, there is a sac or bursa that can become bursitis and effusion which this condition is called poll evil. This disease is mostly caused by trauma or bacterial infection, which if the cause of the infection is *Brucella abortus* is important in terms of zoonosis, in this regard, it should be considered in taking history to find out the cause of the disease. A Turkmen horse was reported in one of the equestrian clubs around Shiraz with an eminence between the ears. After being present at the location and observing the horse, a history was first taken which was the cause of this complication due to the low height of the stall and the high height of the horse due to the impact of the animal's head area with



the roof of the stall. On clinical examination, the area was warm, swollen, inflamed, painful, sensitive to touch and holding the neck still and straight upright while walking and trotting. The aim of early diagnosis poll evil to prevent secondary bone infections and involvement of the skull and vertebrae bones. For treatment, first a mild sedation was given with acepromazine (0.05 mg/kg) and xylazine (1 mg/kg). Then, the poll area completely shaved and prepared for drainage with using antiseptic solution such as betadine 7.5% with detergent (scrub) and betadine solution 10%. Using a scalpel blade number 11, a stab incision was made in center of the complication to drainage the contents. After drainage the contents, poll area thoroughly irrigated with normal saline serum. For antibiotic treatment, ampicillin 6 g every 12 hours for one week and ketoprofen as anti-inflammatory (dose 2.2 mg / kg) every 24 hours for 3 days were administered intravenously. 10 days later, the horse was re-examined to follow up on the treatment, and it was seen that the poll evil had completely recovered and improved.

**Keywords:** Poll Evil, Eminence, Horse, Bursitis, Drainage

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## **Diagnosis And Resection Of Granulosa Cell Tumor In A Dare Shoor Mare: Case Report**

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Granulosa cell tumor (GCT) is the most common ovarian neoplasm in mares and accounts for 2.5-6% of equine neoplasms. Ovarian neoplasms in mares are primarily non-epithelial tumors that cause infertility and behavioral changes in mares. Ovarian tumors are more common in mares than in other domestic species. This tumor does not metastasize and causes the opposite side of the ovary to become inactive. In the spring of 1401, a 15-year-old Dare shoor mare with a history of infertility was examined on a farm in Isfahan province for diagnosis. In clinical examination, the general condition of the mare was normal and the behavior was calm. In rectal, the consistency and tissue of the uterus was normal, the left ovary was painful and larger than normal with a diameter of more than 15 cm, and the right ovary was very small and with small follicles. According to the clinical examination, an initial diagnosis was made of a tumor in the left ovary. To confirm the diagnosis, in addition to performing ultrasound of the uterus and ovaries, blood samples were sent to the laboratory to measure testosterone, inhibin and progesterone. Laboratory findings show that testosterone and inhibin levels were higher than progesterone levels, indicating the presence of a granulosa cell tumor. The result of this tumor will be hormonal changes, especially the increase in serum concentrations of testosterone and inhibin, which eventually causes mares to be anestrous. Ultrasound findings showed cell masses with oncogenic space in the left ovary, which was very similar to granulosa cell tumors, and blood test showed the same. Due to the fact that this type of tumor is benign, the best treatment is surgical removal of the ovary. Due to the presence of the tumor and the resulting infertility, ovarian resection of the left ovary was performed and the ovary was completely removed after complete anesthesia of the mare. After surgery, the left ovary was sent to the pathology department for histopathological evaluation and confirmation of tumor diagnosis. Histopathological findings of ovarian tissue showed the presence of multiple variable-sized follicular structures containing neoplastic granulosa cells in the connective tissue matrix, all this evidence indicates the presence of ovarian granulosa cell tumor.

keywords: Mare, granulosa cells tumor, ovariectomy

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## **Surgery Of A Bladder Rupture In A 3-Day-Old Colt: Case Report**

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A 3-day-old stallion with ambiguous symptoms such as postpartum anorexia, lethargy, lying down and abdominal distention was referred to Large Animal Hospital, Faculty of Veterinary Medicine, University of Tehran. The patient underwent the necessary clinical and pre-clinical examinations (hematological analysis, biochemical analysis, abdominocentesis and ultrasonography). Unsuccessful attempts to urinate, dehydration, lethargy, depression, abdominal distention with fluid and lying down were the most important clinical signs. Electrolyte disturbances and dehydration were observed in the blood test. Abdominal ultrasonography revealed an increased hypochoic fluid with abdominal viscera floating within the fluid. To determine the type of abdominal contents, abdominocentesis was done under ultrasonographic guidance. The sample was clear yellow and, was detected as urine in the laboratory. According to the clinical signs, the patient was diagnosed



with uroperitoneum. This condition is called the accumulation of urine in the peritoneal cavity, which can occur depending on the patient's age for a variety of reasons, including rupture of the bladder, rupture of the urachus, rupture of ureters, or avulsion of the bladder from its urachal attachment. For a definitive diagnosis, the patient underwent an exploratory laparotomy and bladder rupture was diagnosed. This disease should be differentiated from colic and meconium impaction. After stabilization, the patient underwent general inhalation anesthesia and local anesthesia in the incision line with lidocaine. The midline of the abdomen was incised and the ruptured bladder was observed. The bladder was sutured with two layers of Cushing and Lembert suture patterns with 0 polydioxanone suture. The abdominal wall was sutured and closed in three layers after lavage with 0.9% saline. The patient was referred to an internal medicine specialist for further monitoring until normal conditions are reached because due to this operation, serum electrolytes (especially potassium and sodium) and urea/creatinine concentrations should be assessed every 2–6 hours. In addition, the rate of urine output should be more than 1 ml/kg/h, so the patient should be monitored until normal conditions are reached. Postoperative urinary catheter placement is controversial.

Keywords: Bladder rupture – Uroperitoneum – Colt

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2. Lavoie, J.-P. Blackwell's Five-Minute Veterinary Consult: Equine, Third Edition. WILEY Blackwell.

### **Uterine Torsion in Mares: 4 Case**

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Four mares with high gestational age, with symptoms of anorexia, depression, sweating, abdominal pain and increased urination, were referred to the Large Animal Hospital, Faculty of Veterinary Medicine, University of Tehran between 2020 and 2021, after initial diagnosis by a clinician of the horse-riding club with rectal examination. The most important clinical signs in patients were abdominal pain, increased heart rate and increased respiratory rate. Also, vaginal examination was performed to examine whether the cervix was open or closed and abdominal ultrasonography was performed to determine the viability of the fetus. According to the clinical signs, uterine torsion was diagnosed in all 4 cases. The disease occurs in the body of the uterus but less likely in the cervix. Various causes are mentioned for this disease, such as stretching or lengthening of the broad ligament, movement of the fetus and rolling or falling of mares. This disease should be differentiated from colic and normal labor. In two cases (8- and 9-months pregnancy) after general anesthesia and consultation with the owners, an early cesarean section was performed, the torsion of the uterus was corrected and the uterine fluid was drained. Then the incision on the uterus was closed with two layers of Cushing suture pattern. After the surgery, retained placenta occurred in both mares, which were treated after administration of oxytocin. In one of the cases with a gestational age of 9 months, with the request of the owner, the fetus was not removed and only the uterine torsion was corrected. The patient recovered from anesthesia without any complications. Three days after the surgery, symptoms of abdominal pain and vaginal discharge were observed. After ultrasound examination of the fetus, placenta and uterus and vaginal examination of the cervix (closure of the cervix), progesterone (to maintain pregnancy), antibiotics and flunixin meglumine were administered. Pregnancy continued without problems and vaginal discharge gradually decreased but remained until the labor. In one of 4 cases, due to 90-degree uterine torsion, after general anesthesia, a modified technique was used which involved using a plank of



wood to stabilize the fetus while the mare is lateral recumbent and then rotated to correct the torsion. The patient recovered from anesthesia without any complications. After correcting the torsion, progesterone was administered to maintain pregnancy and the pregnancy continued without any problems.

Keywords: Uterine Torsion – Mare – Pregnancy

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## **Cryosurgical Treatment Of An Axillary Sarcoid In Horse**

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Sarcoid is known as the most common skin tumor among horses, often appearing in areas with thin skin and short hair (face, chest, groin, or legs). This type of cancer is not usually malignant but can progress rapidly. Various latent, warty, fibroblastic, and mixed forms are seen in sarcoid skin lesions. The greater the number of lesions, the weaker the prognosis for complete cure. There are various treatments for sarcoidosis and the main challenge of these methods is the recurrence of the tumor after treatment. The choice of treatment strategy in most cases is focused on chemotherapy, laser therapy and cryosurgery. The reviewed reports indicate that cryosurgery is a safe and applicable



method with minimal complications. An 11-years-old stallion with a history of an old wound in the axillary region of the left anterior limb, which had been treated with inappropriate methods. This horse with a proud flesh like mas was referred to the Large Animal Hospital of the Faculty of Veterinary Medicine, University of Tehran. In the first stage of treatment, the mass was completely removed and then a sample was sent for histopathological examination. Due to the impossibility of suturing the site, the skin of the area was bandaged by “tie over” method. But the former mass recurred after two weeks of wound management. After histopathologic evaluations, sarcoid was confirmed as the cause of recurrence. During the follow-up examinations, cryosurgery was put on the agenda in two stages with an interval of three days. After performing two stages of cryosurgery with liquid nitrogen and continuing the treatment as a secondary wound management, after one month after cryosurgery complete healing was observed and recurrence of sarcoid mas was occurred. The main priority is timely and principled treatment of wounds, and cryosurgery can be very helpful in the effective treatment of sarcoid in horses.

key words: Sarcoid, Cryosurgery, Horse, wound management

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### **Concurrent Bilateral Inguinal Herniation And Bladder Rupture Surgeries In An Arabian Foal: A Case Study**

Seyed Ahmad Emadi \*, Ahmad Khajeh, Ali Ashrafian, Sina Mahmoud Abadi, Mohammad Hossein Ekhtiari

A 3-day old Arabian colt was referred to the veterinary hospital of the Shahid Chamran university with following symptoms: lethargy, anuria during last 12 hours, abdominal distention and inguinal canal swelling.





After physical examination and ultrasonographic investigation, free fluid in abdominal cavity and bilateral inguinal hernia were confirmed. Regarding the lack of urination and Urachal duct being open in last few hours, final diagnosis was urine in abdominal cavity and rupture of the urinary bladder or Urachal duct. The foal immediately underwent the surgery and a urinary catheter was placed. After induction of anesthesia, the foal was positioned in dorsal positioning. During the laparotomy, a great amount of urine was observed and with further investigation, a very small hole was seen in the bladder wall. In the site of the small opening, the wall of the bladder was thinned longitudinally and muscular layers were ruptured. The rupture and the opening in the bladder wall were corrected by continuous and simple interrupted suture patterns and the remaining parts of the Urachal duct was dissected from the bladder and the bladder wall was closed with Parker-ker suture pattern. Finally, the abdominal cavity was rinsed with four liters of normal saline solution. In the next surgery, the bilateral inguinal hernia was corrected with two separate incisions in the inguinal region of the foal. Considering the genetic inheritance of the inguinal herniation and despite the recommendations for castration, the foal wasn't castrated due to the owner's request and also in order to preserve the testes and fertility of the foal in the future. Herniated viscera were replaced into the abdominal cavity and the Tunica Vaginalis layer was tightened to the extent of the testicular chord contents. the internal and external rings of the inguinal canal was also tightened with simple interrupted stitches in order to prevent the recurrence of the herniation. Urinary catheter was remained for 5 days and the bladder was drained daily. The clinical evaluation of the foal for the next two months demonstrated the complete recovery and foal's health.

Keywords: Arabian foal, Urinary bladder rupture, Inguinal herniation, Urachal duct

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## **Cystotomy As A Surgical Treatment Of Concurrent Cystic And Urethral Calculi In A Two Years Old Stallion**

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Cystic calculi are the most common type of equine uroliths . Also , urethral calculi are essentially a male horse problem because mares are generally able to void small stones through the urethra , but concurrent cystic and urethral calculi is an extremely rare case in equine practice . A 2 y/o stallion presented to Islamic Azad university veterinary teaching hospital . A large urethral calculus ( 2.5 × 3.5 cm ) removed from urethral process in clinical exam . Urine stream became normal immediately after stone removal. A week later the patient presented again with postexercise hematuria Ultrasonographic examination revealed at least one large cystic calculus . After 36 hours withholding food , xylazine administered as preanesthetic agent . Anesthesia induced with intravenous ketamine and diazepam . The patient positioned dorsally for caudal ventral midline approach . Bladder exteriorized and incised and two large calculi ( 3.5 × 4 cm ) removed and then sutured with absorbable material in two layers consisting cushing and continuous lembert patterns. Abdominal musculature sutured with the same material in cruciate pattern . Penicillin – streptomycin ( 7 days ) and flunixin meglumine ( 4 days ) selected as postoperative management .The patient returned to normal urinary function . Laboratory analysis revealed calculus material as calcium carbonate.

keywords : cystotomy , urethra , calculus , horse .



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## Traumatic Orbital Bone Fracture In A Crossbred Mare

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Traumatic injuries in horses are one the most important causes for wound management. A 9 years old crossbred mare with chief complaint of wound in dorsal region of left eye referred for wound management. In first place the wound thoroughly examined in horse riding club after sedation with detomidine. Because of depth of the wound and exposure of dorsal rim of the orbital bone, fracture of this bone was highly suspected. Radiographs in different views were taken and tangential view of affected eye revealed three fracture fragment and the largest fragment was 7 x 5 mm. thus the mare moved to the large animal hospital of university of Tehran. General examination performed and complete blood count checked before induction of general anesthesia with ketamine and xylazine. After induction and endotracheal intubation, isoflurane was used for maintenance of general anesthesia. Corneal surface of affected eye examined with fluorescein dye and no corneal ulcer was detected. Surgical region and the wound lavaged completely with normal saline and aseptically prepared. Necrotic tissues removed with curettage and sharp dissection. Because of lack of blood supply and small size of fracture fragments, all three of them



were removed to prevent sequestrum formation. Periorbital tissues sutured with PDS USP 0 suture material in cross mattress suture pattern and then subcutaneous tissue with PGA 1 and skin with Nylon 1 in horizontal mattress suture pattern. Penicillin and Gentamicin used as prophylactic antibiotic and continued for 7 days after surgery. Flunixin meglumine used for 3 days as anti-inflammatory medicine. ciprofloxacin and diclofenac Ophthalmic drops prescribed for 7 days as well. Affected eye examined 1,3,7,10 and 14 days after surgery. Skin sutures removed after 14 days. Most common complications after eye and orbital bone trauma are blindness, eyeball injury, infection, hemorrhage and suture dehiscence after primary wound closure. In this horse, despite of orbital bone fracture and depth of trauma, none of mentioned complications has occurred and there was no need for enucleation of affected eye.

Keywords: mare, orbital bone, eye ball, fracture, trauma

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### **Transverse colon fecalith in an Arabian stallion**

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Fecaliths are inspissated balls of fecal material that form as a result of



poor-quality diet, poor mastication, or reduced water intake. In this paper, Transverse colon fecalith in a 14 years old Arabian stallion that had been referred to large animal hospital of faculty of veterinary medicine of university of Tehran has been reported. This patient had recurrent chronic colic over the last year and excreted two small fecaliths in this period. After deterioration of clinical signs, abdominal pain, inappetence and abdominal distention this patient was referred for surgical treatment. After induction of general anesthesia with ketamine and xylazine, tracheal intubation was performed and anesthesia continued with isoflurane. Abdominal wall prepared aseptically for ventral mid-line celiotomy. After celiotomy distended abdominal viscera with gas and fluid encountered and for better exploration, intestinal contents evacuated through cecal and pelvic flexure enterotomy. After further abdominal exploration and palpation, a large mass that caused obstruction was diagnosed in transverse colon. Due to severe clinical signs and diffuse adhesions of transverse colon to other organs and parts of gastrointestinal system, the patient was euthanized. After post mortem pathologic examinations, severe adhesion of transverse colon to base of cecum, right side colons and parts of small intestine was observed. It seems that due to pressure necrosis in obstruction site and leak of intestinal contents into abdominal cavity, adhesions were formed. Enterectomy and anastomosis in transverse colon is not possible. In less severe cases the fecalith can be moved into small colon or right colons and then removed through enterotomy in these structures.

Keywords: horse, colic, fecalith

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2. Medical V, Hospital T. Enteroliths in Horses-a study of 30 cases retrospective. 1979;11:76–84.

### **Transverse colon fecalith in an Arabian stallion**

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Fecaliths are inspissated balls of fecal material that form as a result of poor-quality diet, poor mastication, or reduced water intake. In this paper, Transverse colon fecalith in a 14 years old Arabian stallion that had been referred to large animal hospital of faculty of veterinary medicine of university of Tehran has been reported. This patient had recurrent chronic colic over the last year and excreted two small fecaliths in this period. After deterioration of clinical signs, abdominal pain, inappetence and abdominal distention this patient was referred for surgical treatment. After induction of general anesthesia with ketamine and xylazine, tracheal intubation was performed and anesthesia continued with isoflurane. Abdominal wall prepared aseptically for ventral mid-line celiotomy. After celiotomy distended abdominal viscera with gas and fluid encountered and for better exploration, intestinal contents evacuated through cecal and pelvic flexure enterotomy. After further abdominal exploration and palpation, a large mass that caused obstruction was diagnosed in transverse colon. Due to severe clinical signs and diffuse adhesions of transverse colon to other organs and parts of gastrointestinal system, the patient was euthanized. After post mortem pathologic examinations, severe adhesion of transverse colon to base of cecum, right side colons and parts of small intestine was observed. It seems that due to pressure necrosis in obstruction site and leak of intestinal contents into abdominal cavity, adhesions were formed. Enterectomy and anastomosis in transverse colon is not possible. In less severe cases the fecalith can be moved into small colon or right colons and then removed through enterotomy in these structures.

Keywords: horse, colic, fecalith

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1. Hassel DM, Aldridge BM, Drake CM, et al. Evaluation of di-



etary and management risk factors for enterolithiasis among horses in California. 2008;85:476–480.

2. Medical V, Hospital T. Enteroliths in Horses—a study of 30 cases retrospective. 1979;11:76–84.

### **Inguinal Herniation In Foals: 3 Cases**

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Inguinal hernias of foals are usually congenital and are considered to be hereditary. They occur when the vaginal ring is so large that it permits viscera to enter the vaginal sac. Congenital inguinal hernias of foals may occur unilaterally (usually on the left side) or bilaterally. 3 foals with chief complaint of swelling in inguinal region referred to large animal hospital of faculty of veterinary medicine of university of Tehran. These foals ages ranged from 6 to 7 months old. Two of these patients were males and right inguinal canal was involved and one of them was female and left inguinal region had been involved. After clinical examinations it was found that herniated contents were reducible, and after ultrasonographic evaluation, presence of small intestine was confirmed. General anesthesia inducted with intravenous ketamine and xylazine and after endotracheal intubation, isoflurane used for maintenance of anesthesia. Surgical site in inguinal region prepared aseptically and after reduction of contents a 6 cm incision was made directly over inguinal canal. In female patient, superficial inguinal canal closed completely with size 2 PGA suture material and horizontal mattress suture pattern. In two male patients, the owners insisted on preserving testis on affected side, thus the inguinal ring closed partially and



left open just enough for spermatic chord passage. In these two male foals the same suture material and pattern as female patient was used. Penicillin was used prophylactically and continued for 5 days. Flunixin meglumine used as anti-inflammatory medicine for 3 days. In two patients, inguinal edema observed after 3 days and eliminated after 7 days. Recurrence of herniation and testicular congestion and necrosis has been mentioned as the most important complications after partial closure of inguinal ring. In two male patients that inguinal canal closed partially, none of these complications has been occurred.

Keywords: foal, colt, filly, inguinal herniation

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## **Unilateral Ovariectomy Due To Granulosa Cell Tumor In Mares: 3 Cases**

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Granulosa cell tumor (GCT) is reported to be the most common ovarian neoplasm in the mare and represents 85% of reproductive tract tumors in mares. Granulosa cell tumors are classified as sex-cord stromal tumors as they are derived from, or histologically resemble, the normal cellular constituents of the endocrine apparatus of the ovary. Three





mares were diagnosed with unilateral Granulosa cell tumor by farm equine practitioners between 2020 and 2021 and referred to the large animal hospital of the veterinary medicine faculty of the University of Tehran for ovariectomy. In all three mares, the presence of tumor was diagnosed after rectal examination, then ultrasonography was performed and tumoral structure of the right ovary confirmed. The most important clinical sign of these three mares were irregular estrus cycles in all of them and stallion-like behavior in one of them. The patient fasted for 12 hours before surgery to reduce intestinal contents. Surgery was performed on standing horse that was sedated with detomidine. Right flank region prepared aseptically and incision line anesthetized with local injection of lidocaine. After skin incision, the muscles of the flank region opened in grid method and diseased ovary pulled out through this incision from abdomen and ovarian pedicle ligated and severed with Ecraseur. Abdominal cavity inspected for hemorrhage for several minutes before closure. Abdominal muscles sutured in routine method and skin sutured with number 1 nylon suture material in vertical mattress suture pattern. Penicillin g and gentamicin used prophylactically and continued for 5 days after surgery. Flunixin meglumine used for pain management for 3 days. In one case, a specimen sent to the department of pathology for histopathologic evaluation and granulosa cell tumor was confirmed. In all three mares estrus cycles was normal after surgery and in one of three mares twin pregnancy confirmed in first conception after surgery. In one mare, lameness grade 3 of AAEP was observed 7 days after surgery but no abnormality was observed after clinical examination and lameness solved after phenylbutazone administration. Maybe the cause of lameness in this case was movement restriction and stall rest after surgery. Based on other researches, the contralateral ovary is often small and inactive but in these three patients, the contralateral ovary was normal and cyclic and the first conception after surgery was normal.

**Keywords:** mare, ovariectomy, GCT, tumor, reproductive tract

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## **Cervical Laceration Repair In A 10 Years Old Arabian Mare**

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Lacerations of the cervix usually occur as a result of excessive stretching during foaling. Cervical injury is more likely to develop during dystocia or in association with a fetotomy. Cervical lacerations have been reported to occur during normal parturition or during the abortion of a relatively small fetus. Any injury that disrupts the normal function of the cervix may lead to infertility. A 10 years old Arabian mare with history of infertility in last 3 years was referred to large animal hospital of faculty of veterinary medicine of university of Tehran. Pre and post mating endometritis had been seen in clinical examination history of this mare. Thorough clinical examination was performed and after vaginal palpation presence of two lacerations in 3 and 10 o'clock positions and malfunction of cervix during diestrus was confirmed. After sedation with intravenous detomidin, lidocaine and xylazine injected epidurally for perineal anesthesia. Perineal region cleaned and prepared aseptically. Cervical tissue was retracted by cervical forceps and stay sutures. After retraction of cervix, presence of another laceration in 12 o'clock position was revealed. Scar and fibrotic tissue excised and each laceration was sutured in two layers. Cervical inner mucosa sutured as first layer with continuous horizontal mattress suture pattern with PGA 1 suture material. Cervical muscle and cervical outer mucosa sutured as second layer with same suture material and simple continuous suture pattern. Obstetrics procedures prohibited for 2 months after surgery and artificial insemination for first conception after surgery was recommended. All mares that have undergone dystocia should have their cervix examined approximately 21 days postpartum. Surgery should



be performed during diestrus and no earlier than 3 weeks postpartum.

Keywords: mare, equine, reproductive tract, cervix, laceration

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## **Successful Surgical Treatment Of Colic Due To Strangulated Jejunal At Mesenteric Rent In A Dareh-Shori Mare**

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Colic has been reported to be the main cause of death in horses after old age. One of the reasons for this complication is due to the incarcerating of the small intestine in the mesenteric rent, which is acute and dangerous disorder. A 3-year-old Darreh-Shouri mare with acute colic symptoms was referred to the teaching hospital of faculty of veterinary medicine, University of Tehran. Symptoms of abdominal pain, heart rate of 84 beats/minute and CRT of 4 seconds, congestive mucosa and lack of gastrointestinal sounds were observed in mare before the surgery. With 5 liters of fluid therapy, heart rate decreased to 72 beats per minute for lowering anesthesia risk and then was administered the prophylactic antibiotics. The mare underwent general anesthesia and surgical preparation. After entering the abdomen cavity through the midline approach, the distended intestines were emerged through incision site and then by tracing of the small intestine loops the strangu-



lated jejunum at mesenteric rent was found. The rent was exteriorized, ligatured and transected. The strangulated intestinal segment about one meter was resected and anastomosed by end-to-end pattern. The whole small intestine checkup from duodenum to ileum was done and the contents were drained into cecum. One meter of necrotic jejunum was also removed and two ends of the intestine were anastomosed. The colon enterotomy in pelvic flexure was made. After abdominal lavage and insertion of folly, the celiotomy was apposed in routine manner. 6h after surgery, the mare had hearts rate was 88, urination, lack of gastrointestinal sounds on the right side and an appetite. After 12 h heart rate decreased to 80 beats and abdominal lavage and administration of paraffin were performed. through drainage and paraffin feeding. After 24h with a pulse of 70 the horse had defecation and 48h later, the heart rate reached to 52 and due to temperature of 38.2 and a favorable condition the horse was released. Inability to reduce the intestinal obstruction, severe hemorrhage from the mesentery, and the length of intestine involved are the main factors that decrease survival rates in horses with small intestinal strangulation caused by mesenteric rents. Prognosis related to surgical treatment of mesenteric rent is worse than other strangulation disorders with survival rate of 47%. Rapid referral, rent seeking and exteriorizing, accurate resection and anastomosis and postoperative intensive care would be considered as successful factors. Six months after surgery, the horse is in a good health.

Keywords: mare - colic – jejunum- mesenteric rent

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## **Cesarean Section Challenges In The Kwpn Mare With Uterine Infection**

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Dystocia caused by abnormal presentation, position and posture of foal, fetal large size, fetal deformity and other result. An 8-year-old KWPN mare duo to cesarean was referred to the teaching large animal hospital, faculty of veterinary medicine, University of Tehran. According to the history, the mare had symptoms of labor 8 days before the arrival and the amniotic sac was torn 4 days later. Clinical examination revealed the foal on the anterior presentation, dorsosacral position with the downward deviation of head, both hands outside the vulva and a foul odor of vagina indicating a severe uterine infection. The midline C-Section was made and the tarsal region of foal was exposed, then sealing of infection uterine by packed tamponade and using suction tube were done. The uterine incision was performed to run out foal whom attached to uterine body. The tarsal joint was found and completely wrapped around the incision area, and then the foal pulled out of the mother's body. The celiotomy was closed in routine manner after uterus closure, abdominal lavage and inserting 2 Foley catheters. During 24 hours after surgery, the horse had a heart rate of 72 beats/minute and a temperature of 38.3 °C. The heart rate decreased to 54 bpm until 4 days postoperatively. however, unfortunately in that day the horse lost her appetite and heart rate and temperature increased to 78 and 39.4, respectfully. On day 5 after operation, CBC analysis showed fibrinogen = 0.7, WBC = 15700, Neut.seg = 73%, Lymphocyte = 17%, Neut.band = 4%. Treatment was performed including uterine lavage BID, intrauterine amikacin and penicillin and IM oxytocin. After physical condition improvement, the mare was allowed to be discharged. The C-Section can be considered to be a vital procedure and would be with complication such as hemorrhage, peritonitis, shock, uterine infection and adhesion. The cesarean involving uterine infection is much more challengeable. Sealing of incisional site, using of suction tube, rapid foal delivery and uterine closure would be dramatically decreased abdomen cavity with infection discharge. It would be helpful to insert foley in abdomen for abdominal lavage and discharge



in according with reduction of peritonitis and adhesion postoperatively. Intensive care, case monitoring and intrauterine lavage play key roles at survival rate. After some months, the mare is in good health and return to normal life.

Keywords: cesarean, horse, uterine infection

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## **A Case Report Of Rabies Resembling Colic In A Thoroughbred Mare**

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Rabies accounted as a rare disease in horses and would be invariably fatal. A 6-year-old thoroughbred mare was referred to the teaching large animal hospital of faculty of veterinary medicine, University of Tehran for colic surgery. Severe abdominal pain, restlessness, and muscle tremors and spasms in the horse were so severe that the veterinarian was not allowed to examine the horse completely and according with clinical signs, tachycardia (90 beats/minute) and discomfort, the colic was considered as cause of that horse condition. The 10 ml IM xylazine administration and then two doses of 10 and 15 ml intravenously for less than 1 hour were not effective and didn't reduce pain symptoms in mare. Besides, the gastrointestinal sounds could be heard with approx-



imately 2 liters of paraffin administration by NG tube, but the horse's restlessness was not diminished. Although the mare treated by the same veterinarian previously in when was an obedient horse and did not interfere in clinical examination, the horse's manner was too strange for the practitioner. Eventually, the decision was made to surgery for horse saving. During surgery was observed no abnormal findings and one day after the surgery, the mare showed symptoms such as fear of light, not drinking water and... that was diagnosed rabies and the horse was euthanized and exterminated. All staff and veterinary staff were vaccinated. The Symptoms of rabies consist of colic, restlessness, lameness, urinary incontinence, tremors, muscle spasms, obvious weakness, fear of light and water, which may be confused with colic and simple pain.

Keywords: horse, rabies, colic

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## **Successful Surgical Treatment Of Right Dorsal Displacement Of Large Colon With Clockwise Pelvic Flexure Migration In A 7-Month-Old Kurdish Filly**

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Colic or abdominal pain is one of the most life-threatening diseases in horses. The specific large colon disorders causing colic consist of large colon tympany, impaction, entrolithiasis, sand impaction, displacements, volvulus. A 7-month-old Kurdish filly with colic signs was referred to the teaching large animal hospital of faculty of veterinary medicine, University of Tehran. Due to defecation and normal horse condition, the medical treatment was performed in first including fluid therapy, IV flunixin meglumine and IV metoclopramide. Also, one liter of paraffin was fed. Few hours later the clinical sign was improved but unfortunately 12 hours later physical examination revealed restlessness, tachycardia (82 beats/minute), urinary retention other than overhydration. Due to the persistent symptoms of colic and abdominal distention, the horse underwent exploratory laparotomy in general anesthesia. After surgical site prepared aseptically, the midline was incised. The distended ascending colon was toward the surgical incision which was decompressed and located between right abdominal wall and cecum with clockwise migration of pelvic flexure. The large colon was exteriorized and corrected so that released the cecum, then enterotomy in pelvic flexure was done. The abdominal lavage and incisional site closure were performed in routine manner. One day after surgery, the horse's heart rate returned to normal, had normal defecation and urination and the colic symptoms were completely gone. 17% to 24% of colic admissions have been accounted as a right dorsal of large colon displacement and 19% to 36% of surgical cases. Right dorsal of large colon displacements as a nonstrangulating disorder occur counterclockwise or clockwise category. Clockwise migration of pelvic flexure is less common. In this case, surgery was successful and the foal is in good condition 3 months after surgery.

**Keywords:** surgery, colic, right dorsal displacement of large colon, horse

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colon right dorsal displacement or 180° volvulus (or both) in horses. *Can Vet J.* 2012;53:378–382.

## **Surgical Treatment Of A Lamb Suffering From Congenital Anal Atresia Accompanied By Rectovaginal Fistula; A Case Report**

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Anal atresia is a developmental abnormality of the newborn that results from an autosomal recessive gene. This condition is characterized by the absence of the anus and may be associated with rectovaginal fistula, recto-cystic fistula, vaginal urinary tract agenesis, taillessness, hypospadias, and diphallus. A rectovaginal fistula is an inherited fatal disorder in which there is an abnormal pathway between the rectum and the vagina. The stool also passes through the vagina as the anus does not pierce. A congenital rectovaginal fistula is characterized by the connection between the floor of the rectum and the dorsal roof of the vagina so that the vulva acts as a common opening of the genitourinary tract and gastrointestinal tract. Diagnosis is simple and easy based on history, clinical signs, and physical examination. In some cases, contrast-enhanced radiographs are performed to determine the exact location of the fistula. A one-and-a-half-month-old Kurdish lamb with signs of low stool volume, feces in the vagina, and straining while defecating was referred to the veterinary clinic of Urmia University. After clinical examination, normal physiological symptoms, the presence of feces in the vagina, relative dilation of the abdomen, anal atresia, and fistula in the floor of the rectum and the roof of the vagina were confirmed. Then, with the consent of the owner, surgical interventions were performed to correct this complication. First, the surgical site was prepared asep-



tically. The area was annularly anesthetized with 2% lidocaine. The approximate location of the anus was determined and a cross-shaped incision was made in the area with a scalpel. Subsequently, a hemostatic forceps was used and inserted through the fistula duct, and we attached the rectal mucosa to the incised part using the hemostat. At 9, 3, 6, and 12 hours, simple interrupted sutures with non-absorbable nylon size 2-0 were applied, respectively. Then the space between the individual stitches was filled with a simple interrupted suture pattern. Finally, the fistula was closed using three cruciate suture patterns. The antibiotics Penstrept 1+1 and flunixin meglumine were administered postoperatively for five and three days, respectively. Postoperative follow-up after one month showed that the case had no problems with defecation and no more stools were observed in the vaginal area.

**Keywords:** Rectovaginal fistula, lamb, anal atresia, surgical treatment

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## **Unilateral Cryptorchidism Surgery In Goat**

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Cryptorchidism are rare in goats and most of the left testicles are involved. On clinical examination, the right testicle was in the abdominal cavity, while the left testicle was in the scrotum and had previously been sterilized by a rubber ring. The occult testis was removed by laparotomy of the right flank laparotomy.

**Keywords:** goat , cryptorchidism , unilateral

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## **Surgical Treatment Of Squamous Cell Carcinoma Of The Eyelid In A Holstein Cow By H-Blepharoplasty Method**

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Tumors involving the eyelids, conjunctiva, cornea, and orbit are common in cattle. The most common tumor involving the eye and adnexa is ocular squamous cell carcinoma (OSCC). OSCC is locally invasive. Locally invasive tumors larger than 5 cm in the lower eyelid have minimally responsive to treatments such as cryotherapy and immunotherapy. Therefore, radical surgery is necessary. A 450 kg six-year-old Holstein cow with a large mass in the lower eyelid of the right eye was referred to the surgery department of Urmia University Hospital. The owner declared that small skin lumps have formed in the lower eyelid since 5 months ago and the lesion has become more extensive overtime. In clinical examination, the general condition of cows was normal. skin masses with an ulcerative and hemorrhagic surface and malodor were evident and extended from the epithelium of the lower eyelid to the palpebral conjunctiva. Xylazine (0.2 mg/kg IM) was used for sedation and the cow was restrained in lateral recumbency. Analgesia was provided in the incision site by using infiltration of 8 cc lidocaine 2%. The surgical site was then prepared for surgery as usual. The tumor and 2mm of the healthy surrounding tissue were excised.



Due to the large volume of the mass, the H-blepharoplasty technique was used to reconstruct the lower eyelid. The defect was sutured in three layers: conjunctiva was closed with a simple continuous pattern using 4-0 Dexon suture materials, the muscles were closed with a simple continuous pattern using 2-0 Dexon suture materials, and the skin flap was closed with 1 Nylon suture materials using cruciate suture pattern. Postoperative treatments included administration of flunixin meglumine (1.1 mg/kg) up to three days and penicillin G procaine (20000 UI/kg) up to 5 days after surgery. The mass with dimensions of  $7.5 \times 7 \times 4$  cm and a dense cauliflower appearance was excised. Standard tissue samples were harvested from the excised mass and fixed in 10% neutral-buffered formalin. Following the H&E staining method, squamous cell carcinoma with poor differentiation and extensive tissue damage was detected. Following surgery, the patients' visual perception and general health were normal and no recurrence was observed until three months after surgery.

Keywords: Carcinoma, OSCC, Eyelid, Conjunctiva

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## **Aural Fibrosarcoma In A Holstein Cow: Surgical And Microscopical Study**

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Fibrosarcomas are malignant connective tissue tumors with immature proliferating fibroblasts or undifferentiated anaplastic spindle cells arranged in interwoven patterns. There are only rare reports of bovine vaginal, penile, Mandibular, and perirenal fibrosarcomas in the literature. There has been no report of this tumor in the Holstein. A 5-year-old female Holstein cow with a raised mass at the base of right ear was referred to the Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran. Based on owner information, within the previous 1-month period the mass had become evident. On gross examination, the mass was approximately  $13 \times 10 \times 7$  cm in size. Finally, complete surgical removal was selected, and surgical resection was carried out under local anesthesia with lidocaine hydrochloride 2% and xylazine. The mass was removed for histopathological evaluation, and the incision was sutured by horizontal mattress sutures. On section, the mass was well circumscribed, ulcerated, firm and white to yellow. Tissue samples of the mass were fixed in 10% neutral buffered formalin, routinely processed, dehydrated, embedded in paraffin wax, sectioned at  $5\mu\text{m}$  in thickness and stained with Hematoxylin and Eosin. Sections were examined using a light microscope. Antibacterial therapy was applied with a pen & strep ( $0/1$  mg  $\text{kg}^{-1}$ , IM, SID for 5 days) and *flunixin meglumine* 5% ( $2/2$  mg  $\text{kg}^{-1}$ , IM, SID for 3 days). Microscopically, the aural mass was composed of spindle-shaped cells arranged in interwoven pattern. Cytoplasm was scant, and nuclei were uniform and oval with inconspicuous nucleoli. Mitotic figures were infrequent. Some neoplastic cells had cellular and nuclear pleomorphism. Hemorrhage, necrosis and peripheral aggregates of lymphocytes were observed. The neoplasm was stained positively with Masson trichrome. The neoplastic cells were uniformly positive for Vimentin and negative for Desmin. Base on histopathological findings, the tumor was diagnosed as a well differentiated fibrosarcoma. Similar to other studies, complete surgical removal is the treatment of choice for focal masses (especially well differentiated fibrosarcoma). In the present case, surgery was also performed successfully and no new growth of the mass was observed



four months following the surgical procedures.

**Keywords:** Holstein cow, Tumor, Surgery, Histopathology, Immunohistochemistry

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### **A Case Report Of Cesarean Section In Deer With Dystocia**

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Dystocia during childbirth is one of the major challenges for all types of ruminants. Uterine and vaginal and pelvic channel stenosis, lack of dilation or closure of the cervix, fetal rotation and incorrect placement in the mother's abdomen, fetal death in the mother's abdomen (stillbirth), uterine laziness, infectious agents, meconium excretion, Abnormal fetus (Fetal monster), calcium deficiency and uterine torsion are predisposing factors of this occurrence. In wildlife animals, it is difficult to help the animal to give vaginal delivery due to the difficulty of controlling the animal. Cesarean section is one of the treatment strategies in dealing with dystocia. In different cases of dystocia, different



approaches can be used such as the left flank approach, the right flank (in cases of marked rumen dilation), paramedian, and the ventrolateral. In cesarean section, local anesthesia is used, which has different modes depending on the surgical approach. A deer with a history of rupture membranes with vaginal purulent discharge, was referred to the veterinary team of the faculty of veterinary medicine, university of Tehran, after four days with symptoms of lethargy, anorexia and fever. During the clinical examinations, it was decided to perform cesarean section to remove the dead fetus. The animal was calmed by intramuscular injection of xylazine. To prepare for surgery, the animal was placed on the right side and cesarean section was performed on the left side. For this operation, linear anesthesia was applied and the “ventrolateral” approach was chosen for this operation. After the embryo was removed (the fetus was emphysematous), the uterus was sutured with two layers of inverting sutures (a Cushing layer and a Lambert layer). Muscles and subcutaneous sutures were sutured with a simple suture pattern throughout, skin with a continuous lock suture pattern. Pen-strap and flunixin were prescribed for 5 days for postoperative care. The animal’s appetite returned to normal after one day, and after two weeks, its general condition was reported to be normal. The surgical wound was repaired and the skin sutures were removed 14 days after surgery.

keywords: cesarean section, dystocia, deer

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## **Maxillary And Nasal Fibrosarcoma In Camel : A Case Report**

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Fibrosarcoma is made up of undifferentiated fibroblast-like cells that are very close together , randomly arranged , and have no regular contact with other tissue structures . When fibrosarcoma occurs , the body's fibroblasts lose control of their proliferation and over-proliferate . Like other sarcomas , fibrosarcoma can spread throughout the body . Fibrosarcoma is part of a larger family of cancers called sarcomas . Other examples include osteosarcoma , which specifically affects the bones , and rhabdomyosarcoma , which specifically affects the muscles . Rarely , fibrosarcoma can occur in the bone, but it usually affects the adjacent fibrous tissue rather than the bone itself . This article reports the first case of fibrosarcoma in the maxilla and nasal cavity in camels . In macroscopic examination , a tumor mass with a firm and painful consistency and with an ulcerative appearance accompanied by bleeding was observed . Due to the ulcerative nature of the mass , the camel suffered from septicemia ,severe infection , fever and anorexia . In the histopathological examination , fibrosarcoma was diagnosed .

Keywords: fibrosarcoma , camel , maxilla bone , nasal cavity

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## **A Rare Case Report Of The Dental Pad Cyst Containing Tooth In Lamb**

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The juvenile lamb presented with the pedunculated dental pad mass that prevents milk sucking. Imaging investigation demonstrates the radiolucent cyst containing radiopaque texture in front. The cyst was resected gently with marginal safety and necropsied. There have been dentine-like structures lodged into the rostral cyst wall. Although it seems unlikely the existence of dentine and odontogenic disorders of dental pad cause anatomical absence, it is accurate that oral and dental inspection at least at first two years of age is necessary. Dental disorders at any age could cause malnutrition and decrease productivity in the herd.

Keywords: Lamb, Cyst, Dental pad, Dentine, Malnutrition

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## **Evaluation Of Incisional Wound Healing(Surgical Wound) With Citrus Aurantium Plant Honey Ointment In Rats**

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Wound healing and care to increase the speed of healing and also to prevent chronic and infection has always been considered, but despite extensive efforts in this field, wound control has improved today but has not yet reached the desired level. Therefore, the aim of this study was to evaluate the effect of orange spring honey on shear wound healing in rats. This study was performed on 40 adult rats (negative control, 25% spring orange honey, 75% spring orange honey, positive control (osrine)). Mice were randomly divided into 6 groups and wounds were created on the bodies of mice and the desired drugs were rubbed on the wounds and the percentage of healing was recorded. Chi-square and ANOVA tests were used to compare data. The present study showed that in all studied times, the percentage of wound healing in spring orange group was 75%, which in microscopic and macroscopic examination, we saw better improvement in this group, and in the next degree, spring orange honey 25% best conditions. In the study of growth factor, it was found that on the first and fourth days, the conditions in the spring orange group are 75% significantly higher. According to the results of our study and the above studies, it can be seen that wound healing with spring orange honey is 75% and then spring orange honey is 25% much higher than spring orange honey 75% and 25% in wound healing in Humans used and avoided antibiotics and other unnecessary chemical drugs. However, before that, it is suggested that a human study be done in this field to better understand its impact on humans.

Keywords: Wounds, Honey, Spring Orange

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## Evaluation Of The Effect Of Cold Plasma And Medical Treatment On Wound Healing In Rats

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The aim of this study was to evaluate and compare the rate and effectiveness of argon cold plasma compared to medical treatment with silver sulfadiazine 1% ointment in wound healing. The study was performed on 20 male white rats with an average weight of 250 g and a similar average age. After preparing the rats from Ibn Sina Research Institute, they were kept the same for one week under environmental conditions such as temperature, humidity and light, and nutrition such as the type of diet and the number of meals. Then, to start the research, the rats were randomly divided into two groups (A): medical treatment of wounds and Group (B): Plasma wound treatment. All rats were inhibited 4 hours before each anesthesia under conditions of abstinence and up to 2 hours after drinking water. Rats were anesthetized by intraperitoneal injection of ketamine 10% and xylazine 2%. After scrubbing between two shoulders of each rat, a circular wound was created by sterile 5 mm biopsy puncture. Group A were treated with silver sulfadiazine 1% ointment in 7 sessions and group B in 3 sessions with cold argon gas plasma. Observations and results show that use of silver sulfadiazine 1% ointment has a more acceptable and suitable effect than argon cold plasma on skin wounds healing.

Keywords: wound healing, cold plasma, silver sulfadiazine 1%

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## **Case Report Of Partial Lobectomy Of Liver In Female Intact 6 Years Old Cross Bred Spitz**

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The liver, as the largest gland in the body, is the first site of detoxification, and partial hepatectomy is performed in some animals for liver disease, including arterial fistula, hepatic venous neoplasms, regional liver abscesses, and traumatic injuries. In the referral case to the clinic, where a six-year-old intact female dog with symptoms of nausea, confusion and lack of response to environmental stimuli and was touched by palpation a large mass in the abdomen, we used para clinic for differential diagnosis and biochemical blood test After radiography and sonography, a diagnosis of space-occupying mass was observed in the body area in the front and below the stomach in the epigastric region, which was detected by lobular ultrasound of the liver, whose echogenicity was slightly different from the liver. According to the clinical symptoms and the patient's serious condition, emergency surgery was performed using propofol-induced drug with a dose (6 mg / kg) and continued anesthesia with isoflurane inhaler. A laparotomy was per-



formed and we encountered a space-absorbing mass in the quadrate lobe of the liver, which also trapped some of the peritoneal membrane. Hemostasis was performed by electrocautery, bipolar and monopolar with simple sutures 1.5 to 2 cm long on the liver parenchymatous tissue. Blood counts and liver enzymes and other biochemical parameters that show elevated enzymes such as ALP, ALT, GGT and total bilirubin and reduced albumin and globulin suffering, and the cause of animal hepatoencephalopathy can be attributed to these enzymes. Liver samples sent to the laboratory showed an increase in nodular proliferative cells and fatty change liver, and hyperplastic plates with thin fibrous bands were visible between them and showed no signs of malignancy, which was diagnosed as focal point hyperplasia plus grade 3 fatty change liver.

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## **Anatomical Castration With Bilateral Vaso-Cystostomy In Dogs**

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Due to the pathological and hormonal changes reported in routine canine sterilization procedures, this study was performed to evaluate the possibility of male dog sterilization through vasocystotomy to maintain serum testosterone concentration and investigate possible post-operative complications. Five healthy adult male dogs underwent vas deferens transplantation into the bladder. Under general anesthesia, the caudal abdomen was opened via ventral midline incision. Both vasa deferentia were transected and the distal segments were ligated. Then, through cystotomy, the proximal end of vasa deferentia were sutured to the mucosal layer of the bladder wall on its dorsal aspect, individually. Serum testosterone concentration was measured before surgery and then weekly until the end of the sixth week. Six weeks after surgery, urine and semen samples were collected. Bladder ultrasound, contrast vasography, and biopsies of testicular tissues, vas deferens, and bladder wall were performed. Data were analyzed using one way ANOVA, Dunnett's post-hoc and paired t-test. Statistical analysis showed no significant difference in weekly testosterone levels compared to baseline preoperative levels. Microscopic examination of urine samples showed immobilized and broken spermatozoa. The specimens were free of crystals, casts, and signs of inflammation and infection. Vasography did not show obstruction, dilation, or extravasation of contrast media into the abdominal cavity in any of the dogs, and free flow of contrast media from the injection site to the bladder lumen was clearly detectable. Ultrasound showed no inflammation of the bladder wall after six weeks and the thickness of the bladder wall was not significantly different from preoperative values. In the microscopic study, degenerative changes in the testes and no inflammatory reaction were observed in the vas deferens and bladder wall. This study showed that vasocystotomy can be considered as an alternative method of sterilization of male dogs associated with unchanged testosterone concentration and with no incidence of detectable postoperative complications.

**Keywords:** Bladder, Dog, Sterilization, Testosterone, Vas deferens

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## **Evaluation Of The Effects Of Salvia Miltiorrhiza Hydroalcoholic Extract On Histopathological Parameters In The Prevention Of Ischemia/Reperfusion Damage Induced By Testicular Torsion/Detorsion**

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Testicular rotation is one of the most common urological emergencies. Prompt and timely diagnosis of this disorder and treatment reduce the likelihood of damage to testicular tissue, and increase return of fertility. The golden time of surgery to correct a testicular torsion is known to be 4-6 hours, and the more time passes, the greater the chance of testicular tissue damage. To reduce the damage caused by testicular



torsion, various substances such as antioxidant, anticoagulant, calcium channel blockers, vasodilators, anti-inflammatory drugs and herbal medicines have been evaluated. In this study, the preventive effects of hydroalcoholic extract of *Salvia miltiorrhiza*, which has high antioxidant properties, on reducing ischemia/reperfusion of testicular tissue were investigated. 18 adults male Wistar albino rats were randomly divided into three groups: 1- Sham group: In this group, after induction of anesthesia, the left testicle was removed through scrotal incision and returned to its normal position without manipulation. 2- Torsion/detorsion group: In this group, the left testicle was pulled out through an incision in the scrotum sac and the testicular torsion was applied 720 degrees in a clockwise direction for 2 hours and the detorsion continued for 2 hours. 3- Treatment group: Torsion/detorsion was performed same as group 2 and 30 minutes before detorsion, *Salvia* extract at a dose of 200 mg/kg was administered intraperitoneally. After 2 hours of reperfusion, all rats were euthanized With the approval of the University Ethics Committee (LU-9211501009-2020) and testicular tissue samples were taken. Tissue parameters including mean seminiferous tubular diameter (MSTD), testicular capsule thickness (TCT), mean testicular biopsy score (MTBS) and germinal epithelial cell thickness (GECT) were evaluated. Histopathological parameters such as MSTD, GECT, MTBS and TCT were significantly lower in the torsion/detorsion group, while extract treatment significantly increased MSTD, GECT and MTBS ( $P < 0.05$ ). Therefore, it is recommended to use *Salvia miltiorrhiza* hydroalcoholic extract with high antioxidant properties to reduce the damage caused by ischemia/reperfusion of testicular tissue.

**Keywords:** Testicular torsion, *Salvia miltiorrhiza* extract, Torsion/detorsion, Ischemia/Reperfusion

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## **Surgery Of Swollen And Inflamed Eyes With Severe Exophthalmia In Oscar Fish**

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Popeye\_ medically known as exophthalmia\_ is a type of disease in which the eyes of a fish will bulge out, and will appear cloudy or white which caused by frequently exposure fish to unhealthy water condition. Therefore ponds, aquariums and water gardens need regular maintenance to ensure optimal water quality. This disease is unilateral and bilateral which is different in etiology. An Oscar fish (*Astronotus ocellatus* from cichlid family, 1 year old, 400 gr) was brought to Dr. Fish clinic (Tehran, Iran). An ophthalmic infection with hexamitiasis was diagnosed that showed the poor quality of the care provided for the fish. The result of clinical examinations of both eyes and microscopic investigation on blood smear together with wet mount of the body surface showed no trace of any parasites in the wet mount however, blood smear showed bacterial activities meaning a systemic infection of the whole body that could cause the eye problems as well. Due to lack of vision in both eyes, an eye removal surgery was needed. The Oscar was put in 5 liters of water taken from the original fish tank. 0.5 cc of the extract of carnation flower (*Dianthus caryophyllus*) was added gradually in 0.1 cc drops to the water. After surgical anesthesia, the fish was put on a clean wet towel. Eyes were held with a forceps and cut thoroughly with a scalpel. Hemorrhage was controlled via electrocautery on both eyes. Then, Oscar was put back into the original tank with a higher aeration level that caused recovery in 2 minutes. Every day for a period of 10 days, a 100mg nitrofurantoin tablet was added per 40 liters of tank water. Metronidazole was also prescribed in 5mg/L every 24 hours for 10 days. The fish was given back to the owner with new



instructions shortly after recovery and started feeding 7 days after the therapeutic period.

Keywords: Oscar, fish, bacterial, surgery, eye

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## **The Effect Of Intratesticular Injection Of Calcium Chloride Nanoparticles On Spermatogenesis In Rat**

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Neutering is the most common method of animal population control. Anesthetic complications, surgery and recovery are the important risks of this procedure therefore, newer methods for example chemical castration with various compounds like calcium chloride nanoparticles were introduced. Chemical castration not only have lesser pain, anesthetic and surgical risk but also is quicker in other words it's more humane than surgical procedure for male dogs. In this study 36 male Wistar rats randomly assigned in six groups: control, sham, nanoparticles with concentration of 1.25%, 2.5%, 5%, 10%. Each rat was sedated with ketamine-xylazine combination and both testicles were injected with nanoparticles. Sixty days after injection rats were anesthetized



with of ketamine-xylazine combination and euthazized with cervical dislocation. Blood samples, testicular tissue and sperm were withdrawn from each rat and gonadosomatic index(GSI), viability, sperm count, motility, morphology, teratozoospermia index(TZI), sperm nuclei maturation, sperm DNA damage and Mlondealdehyde(MDA) content of testicular tissue were measured and evaluated with SPSS software. Results of this study demonstrated that viability, sperm count and motility were reduced significantly in treatment groups However, nuclei maturation, TZI and MDA content in treatment groups were increased( $P<05$ ). Sperms morphology showed no significant difference between groups( $P>05$ ). In conclusion injection of calcium chloride nanoparticles could be effective for male castration which had lesser pain for animal and were quicker and simpler for surgeons.

**Keywords:** Chloride Calcium nanoparticles, Intratesticular Injection, Sperm parameters, chemical castration, Spermatogenesis

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### **Six Cases Of Feline Injection-Site Sarcoma**

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Feline Injection-Site Sarcoma (FISS) is a malignant mesenchymal neoplasm that has a high recurrence rate and low metastatic potential. This tumor is usually caused by chronic inflammation due to vaccines or long-term injection of various drugs. Fibrosarcoma, malignant fibrous histiocytoma, rhabdomyosarcoma, myxosarcoma, liposarcoma, nerve sheath tumor, osteosarcoma and chondrosarcoma have been reported in the injection sites. The aim of this report is to present the histopathological and immunohistochemical findings of this tumor. In a six-year period, six cases suspected to feline injection-site sarcoma were referred to the pathology department, faculty of veterinary medicine, University of Tehran from six male and female DSH, DLH, and Persian cats with three to five years of age. Masses had grown in the lumbar vertebrae region and between the two scapular crests. Weight loss was significant in one of patient. In histopathological examinations neoplastic spindle cells were seen arranged in interwoven bundles, possessing pleomorphic nuclei and anisokaryosis. Infiltration of lymphocytes and macrophages was observed. In two cases intracytoplasmic gray and globular material were seen in the peripheral macrophages. Areas of intratumoral necrosis, hyperemia with mucinous material as well as some giant cells were other observations. Histopathological findings were strongly suggestive of fibrosarcoma. Special staining and immunohistochemistry ( $\alpha$ -SMA, SMMHC, Desmin and Vimentin) were used with the aim of differentiating and confirming the diagnosis, and fibrosarcoma was confirmed in all cases. Interestingly, in one patient, Masson's trichrome staining implied muscle differentiation of neoplastic cells, with strong Desmin immunostaining. Interpretation of special staining and immunohistochemistry along with H&E findings indicated occurrence of fibrosarcoma with myogenic phenotype that is expectable in feline injection-site sarcoma. Treatments for this tumor include surgery, radiotherapy and chemotherapy, but because of the poor prognosis, today the focus is on changing the vaccination and injection sites and methods in cats. Areas such as the distal limb and tail are recommended for injections so that in the event of a tumor, amputation can be performed easily.

**Keywords:** Feline injection-site sarcoma, Immunohistochemistry, Fibrosarcoma, Vaccine, Inflammation.

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## **Clinical Report Of Surgical Management Of Calcinosis Circumscripta In The Limbs Of An Iraqi Dog**

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Calcinosis Circumscripta is an uncommon disorder characterized by calcium deposits in soft tissue. Mineralization of soft tissues has been classified into three types according to underlying factors: metastatic, dystrophic and idiopathic calcinosis. The condition is characterized by the formation of nodules on sites of previous trauma, pressure points, and bony prominences including the footpad, tongue, spine, salivary gland, and aorta. The syndrome is seen most commonly in young, large breed dogs, with German Shepherd dogs being predisposed. An 18 month old Iraqi dog with severe lameness and multiple masses in the elbow joint in both hands, the tarsal joint of the right limb and the footpad of the left limb was referred to the specialized veterinary hospital of Urmia university. On initial examination, the masses had a firm structure and normal temperature. On the radiograph, the masses were radiopaque and showed signs of mineral deposition in the masses. According to radiographic findings and mineral deposition in soft tissue, hematological and biochemical tests of blood serum were performed



to assess the health of liver, kidney and other organs of the body. Due to the severe lameness of the patient, surgical removal of these masses was suggested to the owner. The removed masses were sent to the pathology department for definitive diagnosis. In the pathology interpretation, the tissue section had a nodular pattern with the presence of a central homologous necrotic pink to purple area of, which was surrounded by thick adult connective tissue. The collagenous rim with a variable number of fibrous tissues around the center that had a lower density with inflammatory infiltration of macrophages, fibroblasts and lymphocytes. According to the results of surgical and histological interventions, multiple Calcinosis Circumscripta masses can be considered as differential diagnoses in lameness of large(Iraqi) dogs.

Key words: Surgery, Calcinosis Circumscripta, Dog, Lameness

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## **Surgical Management Of Crop Fistula In Two Green-Cheeked Parakeet**

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Crop is a dilation of the oesophagus after which it joins proventriculus and the gizzard in the thoracic cavity. Crop serves to store food before it moves into the gizzard and proventriculus for digestion. Crop fistula is a common ailment in Psittacine birds which might be due to accident, chronic irritation and feeding of hot food by owners. Two three-month-old Green-cheeked parakeet were referred to Urmia university veterinary hospital with chest wounds. According to the history, the time of the wound was reported six days before the hospital visit. At the time of the initial examination, the parrots were active, alert, with good appetite and standing posture. Pain evinced on palpation was noticed. After lavage and closer examination of the wound site, the crop fistula was diagnosed; The crop contents and serous discharge oozed out from the fistula and wound was noticed. According to the patient's owner's statements and the mentioned symptoms, incorrect, inappropriate and continuous use of gavage (metal) catheter for feeding, the cause of the problem was identified. After initial procedures, it was decided to repair the crop fistula with using surgery. Anesthesia and surgical technique were performed in both patients with the same method. Primary sedation was performed by intranasal administration of Midazolam. Induction of anesthesia was performed by inhalation and aseptical preparation was performed. The crop fistula was surgically repaired by debriding the edges of the fistula, separating the crop and skin. The crop was sutured using synthetic PGA 3.0 (Poly Glycolic Acid) by continuous pattern and skin was closed with interrupted pattern. After recovery from anesthesia, both patients were discharged. Postoperative follow-up shows complete improve to about 6 months after surgery.

Key words: surgery, crop, fistula

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## **Mast Cell Tumor In A Mixed-Breed Dog: Surgical And Microscopical Study**

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Mast cell tumors are the second most common tumor in dogs and account for 16-21% of all canine cutaneous tumors. In clinical examinations, mast cell tumors are often seen as solitary or multiple simultaneous masses. In May 2021, a 3-month-old, mixed-breed female dog with a cutaneous mass on the left anterior limb was referred to the Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran. The raised mass was measured  $12 \times 13 \times 3$  mm. Finally, the mass was removed by surgical excision and the incision was sutured by a simple interrupted suture pattern. For further studies, that was fixed in 10% neutral buffered formalin and sent for histopathological examination. The samples were sectioned and stained with Hematoxylin and Eosin (H&E). Immunohistochemical studies of the mass sections were performed using Vimentin, c-kit and Cytokeratin AE1/AE3. The patient was administered Meloxicam (0.20 mg/kg, IM, SID for 4 days), and Amoxicillin (15 mg/kg, IM, q 48h for 6 days). No clinical signs of recurrence were apparent 10 months after cessation of surgery. Microscopically, epidermal erosion and ulcers were seen. The neoplastic cells with high density were observed in the dermal layer of skin. These cells were round, with a marked cytoplasmic border, hypochromatic nuclei and distinct nucleus. There was a great number of eosinophils around the neoplastic tissue. Immunohistochemically, neoplastic cells were positive with Vimentin, c-kit, and negative with Cytokeratin AE1/AE3. According to clinical and histopathological examinations, the mass was diagnosed as a mast cell tumor. Mast cell tumor should be differentiated from other round cell tumors such as lymphoma, histiocytoma, plasma cell tumor, and melanoma. Therefore, the use of immunohistochemical staining





can be helpful in more accurately diagnosing neoplasms.

Keywords: Tumor, Dog, Surgery, Histopathology, Immunohistochemistry

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## **Correction Of Third Eyelid Eversion In Three German Shepherd Dog Using Partial Resection Third Eyelid Cartilage**

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The third eyelid is supported by the T-shaped cartilage in the canines, and sometimes deformation of the cartilage can lead to a condition called “Third Eyelid Cartilage Eversion”. This disease is one of the common disorders of third eyelid particularly in Dobermans, German Shepherds and can easily be confused with cherry eye. In this ret-



rospective study three dog affected by Third eyelid cartilage eversion have been presented to veterinary hospital of Ferdowsi University and underwent surgery after diagnosis. Patient was positioned appropriately to access affected eye and corneal & conjunctival surfaces aseptically prepared for surgery. Lower eyelid margins were also kept open with two stay sutures. A horizontal incision (parallel to margin of T-shaped cartilage) made on the bulbar surface of third eyelid and bluntly dissected to the eyelid cartilage and the cartilage is then resected from malformed point. Third eyelid incision was not closed in order to heal with second intention process. Ciprofloxacin and betamethasone eyedrop administered for 5 days. In 6-12 months post operation follow-ups no complication was observed with any of the patients. Eversion of the third eyelid and continuous contact with corneal surface can irritate the eye and cause purulent discharge or sometimes keratoconjunctivitis sicca (KCS). Partial resection of the third eyelid cartilage is superior to total resection because complete resection reduces the stiffness of the third eyelid and results in lesser potency to cover eye surface.

**Keywords:** Third Eyelid Cartilage Eversion, German Shepherd, KCS, Cherry Eye

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## **Canine Spleen Angiosarcoma: A Case Report**

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An 11-year-old female Shih-Tzu terrier with signs of decreased appetite, lethargy, and increased breathing was referred to the veterinary teaching hospital of the Ferdowsi University of Mashhad. The dog had a history of cardiovascular disease and was spayed 5 months prior. A clinical examination was performed. The dog was alert and seemed to have a normal body condition score. Body temperature was within normal limits and mucous membrane color was bright pink and capillary refill time was normal. The femoral pulse was strong. Blood sample analysis revealed mild anemia, red blood cell fragmentation and acanthocytosis, thrombocytopenia, and neutrophilia. Liver and renal function were normal. Radiography and Ultrasonography evaluations of the abdomen revealed a mass. Thoracic radiographs were also obtained but there was no metastasis. Based on history, signalment, and physical and imaging evaluations abdominal tumor was diagnosed and after informing the owner surgery was performed. The tumor was attached to the spleen and a partial splenectomy was performed. The tumor was removed, and a pathology sample was obtained for further evaluation. The mass was composed of pleomorphic spindle cells that diffuse and form irregular blood-filled cavities. The vascular spaces were variably slit-like to the honeycomb-like pattern. Also, a sarcomatous pattern interfaced with the vasoformative region was seen. The cells had variable amounts of eosinophilic cytoplasm with pleomorphic nuclei. Furthermore, mitotic figures, necrosis, and hemorrhage were identified. In conclusion, a canine spleen angiosarcoma was diagnosed based on physical examination, radiography, ultrasonography, and histomorphology. Six months after the surgery a follow-up check-up was performed, and blood samples and thoracic and abdominal radiographs were taken. The dog is healthy without any of the clinical signs mentioned before.

Keywords: Canine, Spleen, Angiosarcoma.

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## **A Case Report Of Diagnosis And Surgical Treatment Of Bladder Rupture In A Puppy Following A Traumatic Injury 10 Days After A Road Accident**

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Accumulation of urine in the abdominal cavity or uroabdomen can occur as a consequence of vehicular trauma in dogs and cats. A 5 months of age, male and native breed puppy, was referred to the department of surgery at the Veterinary hospital of Shahid Bahonar University of Kerman. History of this case was an accident and subsequent transverse fracture of the left humerus and left femur, orthopedic surgery intervention (internal fixation using Intramedullary pins and cerclage wire with external fixation by fiberglass cast). This referral aimed to change the external fixation of the fractures and examine the internal fixation and the process of fracture healing radiologically, 10 days after the accident. Coincidentally, extreme abdominal distension and ascites-related findings were observed on radiographic images. Abdominocentesis was done according to the principles of asepsis and the sample with the blood sample was sent to the laboratory for paraclinical evaluation. Parameters included creatinine concentration in blood 3.1 mg/dL and in abdominal fluid 52 mg/dL, leukocytosis, neutrophilia and shift to left and BUN concentration in blood 90 mg/dL. Analysis of information obtained from clinical and paraclinical examination led to the diagnosis of uroabdomen complication. The urinary catheter was inserted and fixed, and urine was emptied regularly. After fluid therapy and stabilization of the patient, the decision was made to perform



exploratory celiotomy surgery. Upon entering the peritoneal cavity, a volume of 350 ml of fluid was suctioned and then bladder rupture was confirmed by examination of the bladder. Necrotic tissue of the bladder wall was removed and the fresh incised edges were sutured with a simple continuous pattern in one layer and serosal patch provided over the incision line. The abdominal cavity was rinsed with a suitable volume of warm sterile saline and the celiotomy incision was closed as usual. 24 hours after surgery, blood parameters changed including the blood creatinine concentration reaching 1.5 mg/dL and the BUN concentration in the blood arriving at 27 mg/dL. In traumatized patients, it is necessary to check the normal condition of the abdominal organs, including the bladder, in addition to checking the suitable condition of the diaphragm.

**Keywords:** Bladder Rupture, Uroabdomen, Puppy, Road accident.

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## **Pulmonary Lobectomy and Diaphragm Rupture Repair in an Indigenous Dog: A Case Report**

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A five-month-old native dog with a history of an automobile accident



was admitted to the clinic for treatment. The clinical examination revealed symptoms of respiratory distress. The rib cage, head, abdominal area, and skeletal organs were x-rayed to assess traumatic complications. The radiograph showed that the animal suffered from a diaphragmatic rupture. In order to carry out diaphragm repair surgery, the surgical site was aseptically prepared. The animal was pre-anaesthetized with a ketamine(5mg/kg)-diazepam(0.5mg/kg) combination and underwent the induction of anaesthesia with isoflurane. Following the reconstructive surgery, the dog had apnea at regular intervals, once every four to five hours. Subsequent radiographs showed that the animal had pneumothorax. In order to make a definitive diagnosis of the complication, the animal was referred for a CT scan, which revealed the rupture of the right middle lobe of the lung. The animal was again prepared to undergo surgery for pulmonary lobectomy based on the above-mentioned anaesthesia protocol. The elective approach was the fifth right intercostal space. The related bronchus was separated from the surrounding area using blunt dissection after proper vascular ligation. Two atraumatic forceps were placed on the proximal and distal sides of the supposed incision line, also Some stitches with a horizontal mattress pattern using a 2.0 PDS and a round needle were placed proximal to it. The incised site was closed with the above-mentioned suture material in an interlocking pattern. Using normal saline, a leak test was conducted both before and after surgery to ensure there would be no rupture in the other lobes. After the operation, a recovery period of several days was considered for the animal and the symptoms of respiratory distress disappeared. Since the lung has a vital role in the life of an animal, it is necessary to treat pulmonary injuries.

**Keywords:** pulmonary lobectomy, diaphragmatic rupture, respiratory distress, CT scan

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## Removing Ureteral And Renal Calculi In A Persian Cat Using Urethrotomy And Nephrotomy: A Case Report

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A two-year-old Persian cat with symptoms of hematuria and frequent urination was admitted to the clinic. Radiography revealed three stones measuring 0.24, 0.29, and 0.46 cm in the left ureter. Two of them were located at the beginning and the other in the middle of the ureter. Radiographs also showed a stone measuring 0.32 cm in the right kidney. The animal underwent supportive treatment for a week so that its condition could stabilize. Since the stones did not move around and the level of blood urea nitrogen had increased, it was decided that surgery should be carried out to remove stones. Aseptic conditions were first maintained, and then the animal was prepared for surgery using the pre-anesthetic combination of ketamine(5mg/kg) and diazepam(0.5mg/kg) and the induction of anesthesia with isoflurane. Next, two urethrotomy incisions were made longitudinally, one at the beginning of the ureter and the other in the middle. Finally, the stones were removed. The incisions were sutured transversely with a 6.0 PDS in a simple interrupted pattern. A cystotomy was performed for the placement of a double-J catheter to prevent stenosis. It was removed two weeks later. One and a half months after urethrotomy, nephrotomy was performed to remove stones from the right kidney and the pelvis was washed with normal saline. The renal capsule was sutured using a 6.0 PDS and a round-bodied needle in a simple continuous pattern. A postoperative ultrasound examination was carried out to ensure the complete removal of the stones. Two weeks after surgery, blood tests and clinical signs showed that the animal was recuperating. Urinary tract obstruction caused by calculi and the resulting hydronephrosis and uremia can threaten the life of an animal. These repercussions necessitate the need for such



surgeries.

**Keywords:** urethrotomy, nephrotomy, urinary stones, Persian cat, hematuria, frequent urination

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## **Functional Evaluation Of Novel Design Of Spay Retractor In Conventional Ovariohysterectomy Procedure In Dogs**

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Ovariohysterectomy (spay) is one of the most common operations in pet clinics and hospitals. Since this operation is in high demand, the surgeons are keen on using tools to enhance the pace and quality of the surgery. The new spay retractor (Iranian Spay Retractor) (ISR) not only organizes and accelerates the stages of operation, but also facilitates the surgeon to perform it without assistant. This research target is to design and build a new spay retractor merging Balfour retractor and two hemostatic forceps. 12 local-breed dogs are divided into two groups. Group one (experimental group) was operated using the new spay retractor. Group two (control group) was operated with classic ovariohysterectomy methods. In experimental group, having the plate under the reproductive organs to separate operation site from the rest of abdominal area using the new spay retractor clearly eases the whole





operation in comparison with the classic methods in control group. During the operation, in time of ligation the number of sutures, cuts, and hemostatic forceps, the bleeding rate, and amount of blood in abdominal cavity is noticeably reduced using the new spay retractor. Studying the collected data declares that ovariohysterectomy using the new spay retractor (ISR) eases and accelerates the operation. Also, because of the reduction in amount of consumables and time, the cost and length of operation and chance of post-operation infection and pain would be lessening. Moreover, the surgeon would be able to perform more operations in the same period

Keywords: Ovariohysterectomy, new spay retractor, dog.

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## **Evaluation Of The Effects Of Rosmarinic Acid On Oxidative Stress Parameters In Preventing Testicular Torsion / Detour Injury In Rats**

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Testicular torsion is one of the most common emergencies in andrology and urology. Infertility or reduced fertility may occur following testicular torsion, which requires prompt intervention to correct. The golden time of surgery to correct a twisted testicle is known to be 4-6 hours, and the more time passes, the greater the chance of testicular tissue damage. To reduce the damage caused by testicular rotation, various substances such as antioxidants, anticoagulants, calcium channel blockers, vasodilators, anti-inflammatory drugs and herbal medicines have been investigated so far. In the present study, the prophylactic effects of rosmarinic acid, which is a powerful antioxidant, on reducing ischemic/reperfusion injury of testicular tissue were examined. 20 adult male Wistar albino rats were randomly divided into four groups: 1- Sham group: In this group, after induction of anesthesia, the left testicle was removed by scrotal incision and returned to its normal position without manipulation. 2- Torsion/detorsion group: In this group, the left testicle was removed through an incision in the scrotum sac and the testicular torsion was applied 720 degrees in a clockwise direction for 2 hours and the detorsion continued for 2 hours. Groups three and four that had torsion/detorsion injury similar to group two and Rosmarinic acid intraperitoneally at doses of 50 mg/kg and 70 mg/kg 30 minutes before detorsion, respectively. After 2 hours of reperfusion, all rats were euthanized with the approval of the Lorestan University Ethics Committee and testicular tissue samples were taken. Oxidative stress parameters including: malondialdehyde (MDA), glutathione peroxidase (GPx) and catalase (CAT) in testicular tissue were evaluated using commercial kits of Navand Salamat Urmia Company and according to the kit protocols. The results showed that MDA was significantly reduced in both treatment groups compared to the control group ( $P < 0.05$ ). Moreover, rosmarinic acid treatment group with a dose of 70 in comparison with other treatment groups significantly reduced the amount of MDA ( $P < 0.05$ ). CAT and GPx parameters were significantly increased in both treatment groups compared to the control group ( $P < 0.05$ ). treatment group with 70 mg/kg doses further increased CAT and GPx values but this increase was not significant ( $P > 0.05$ ). In general, rosmarinic acid is a powerful antioxidant and reduces oxidative stress in testicular tissue.

Keywords: Testicular torsion, Rosmarinic acid, Torsion/detorsion,



## Ischemia/Reperfusion

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## **Resecting Testicular Teratoma Tumor From A Female Pseudohermaphrodite Dog: A Case Report**

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A six-year-old female Spitz weighing nine kilograms was admitted to the clinic for a mammary masses removal from the inguinal area. According to the animal owner, these two asymmetrical and semi-hard masses had grown in recent months and the dog had undergone estrus many times.

On clinical examination, two palpable masses of approximately six centimeters were located in the breasts of the inguinal region. Assuming that they were mammary gland tumor, it was decided to perform surgery for their removal. The site was aseptically prepared and surgery was carried out using pre-anesthesia with a ketamine(5mg/kg)-xylazine(2mg/kg) combination and the induction of intravenous anesthesia with a ketamine(5mg/kg)-diazepam(0.5mg/kg) combination. A mid-line incision was made in the lumps and, using blunt dissection, they were removed. Contrary to expectations, the masses did not have much angiogenesis. Surprisingly, the two masses had tissue and appearance quite similar to the testicles and had been situated in several layers.



After opening the layers, the epididymis, vas deferens, and nourishing vessels were precisely located and testicle like tissue was removed after proper ligation. The masses were sent to the pathology laboratory in formalin. Blood tests were performed to control sex hormone levels. Pathologic results demonstrated that the removed masses were testicular tissue with a mature teratoma. Histologically, the undescended (hidden) testis had active ducts; however, testosterone levels in this case were within the normal range a female dog has. The present case report is important in that the timely diagnosis and removal of hidden testicles in pseudohermaphrodite female dogs can save them from the possible metastasis of testicular tumors.

**Keywords:** pseudohermaphrodite, testicular tumor, teratoma, pathology, Spitz

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## **Surgical Treatment Of Diocophyme Renale (Giant Kidney Worm) In American Pit Bull Dog**

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A seven-month-old female American pit bulldog with a history of hematuria was brought to the veterinary hospital by his owner. Abdominal pain, fever and muscle weakness were present in the physical examination. Abdominal radiograph and ultrasonography were performed to evaluate the abdominal organs. The left kidney was normal in size (59.3 mm) and parenchymal echogenicity. However, the right kidney was enlarged (72.4 mm), containing numerous tubular structures (ring-like structures) with anechoic to hypoechoic in the center and hyperechoic wall in the renal pelvis and collecting ducts. Complete blood count (CBC) and serum biochemistry (CBT) were taken. The hemogram showed leucocytosis by neutrophilia with left shift toxic granulation neutrophils. renal function was normal with creatinine values of 0.74 mg/dl (reference value: 0.8–1.8 mg/dl) and urea of 23.5 mg/dl (reference value: 15–40 mg/dl). Urinalysis was performed, and the presence of parasite ova in the urine and infection with *Dioctophyme renale* (giant kidney worm) was confirmed. For the initial treatment, ceftriaxone (20mg/kg – q12hr) was prescribed, and after two days, the dog was ready for the surgery. Premedication anesthesia was started with ketamine (4 mg/kg) and diazepam (0.2 mg/kg). induction of anesthesia was with midazolam (0.2mg/kg) and propofol (2.5 cc). Isoflurane was used for maintenance. Right-sided nephroureterectomy was done. Sever adhesion was present between the uterine horns, caudal vena cava, right kidney, liver, and omentum. Omentum and mesentery were also icteric. Postoperative drugs was ceftriaxone (20mg/kg-q12hr, ampicillin (20mg/kg-q12hr) and metronidazole (15mg/kg-q12hr) for 5 days. After five days till now, the dog lives without parasite ova in the urine. The *Dioctophyma renale* (giant kidney worm) is a worldwide occurring nematode and is the largest nematode infecting domestic animals, especially dogs. Vermins are oviparous, and the female can get more than 60 cm in length and 1 cm in diameter. The prepatent duration for *Dioctophyma* is approximately 155 days, and the entire life cycle can take two years. Transmission of this parasite involves eggs being passed in the urine of the infected host. Usually, just one of the kidneys is affected, the right kidney more often than the left one, due to its anatomic proximity to the duodenum. This study aims to report a case of parasitism by *Dioctophyma renale*, where the treatment was accomplished in time to allow the cure of the disease.



**Keywords:** *Diectophyme renale* – parasite – Dog – nephroureterectomy

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**Successful closure of left-to-right patent ductus arteriosus in German shepherd dog with concurrent pulmonary edema**

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A two-year-old female German shepherd dog with a history of exercise intolerance, cough, and dyspnea was brought to the veterinary hospital by her owner. In physical examination, respiratory distress, tongue cyanosis, focal continuous murmur audible at the apex, and precordial



thrill at the left heart base was present. Chest radiograph and echocardiography were performed to determine chamber sizes, wall thickness, systolic ventricular function, and presence of any concurrent cardiac defects. Right ventricular dilation and thickening, dilation of the main pulmonary artery, flattening of the interventricular septum, pericardial effusion, and pulmonary edema were found. The final diagnosis was type 2 Patent ductus arteriosus (left to right). A complete blood count was performed to find any concurrent infection and to determine the presence of anemia or erythrocytosis. After stabilizing the case with diuretic drugs (Frusemide 2mg/kg) for two days, the case was ready for PDA closure surgery. Premedication anesthesia was started with methadone (0.2mg/kg) and acepromazine (0.02 mg/kg). Induction of surgery was with midazolam (0.2mg/kg) and propofol (2.5 cc). Isoflurane was used for maintenance. PDA was closed with two ligatures (silk 0) after left lateral thoracotomy (4th intercostal space) without any possible complication like inadvertent ductal rupture during dissection. Post-operative drugs were tramadol (3mg/kg- q12hr) for 3 days, meloxicam (0.1mg/kg-q24hr) for 3 days and cefazolin (20mg/kg-q12hr) for 7 days. After one week till now, the dog lives without any problem. Patent Ductus Arteriosus is the most common congenital heart defect in dogs, occurring in 1 of 1000. German shepherds are one of the breed predisposition factors. Dogs with untreated PDA usually develop progressive left-sided CHF and pulmonary edema. Most dogs with untreated PDA die before one year of age. This study shows that the success rate associated with surgical closure is very high if the condition is treated before heart failure develops. The prognosis for a normal life after surgery is excellent.

Keywords: patent ductus arteriosus –echocardiography – Dog – thoracotomy

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## **Surgical Treatment Of Gastric Adenocarcinoma In A Mixed-Breed Dog**

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A twelve-year-old male dog with a history of chronic vomiting, diarrhea, and weight loss was brought to the veterinary hospital by his owner. Abdominal pain and melena were detected during physical examination. Complete blood count (CBC) and serum biochemistry (CBT) were taken. The hemogram showed leucocytosis by neutrophilia. Also, Increasing in GGT and AST factors was seen. Abdominal ultrasonography was done for differential diagnosis. Thickening of the pyloric canal up to 12mm and mucosal layer up to 5.4mm was seen. The fluid-filled stomach is extended up to the caudal abdomen and compresses all abdominal organs caudally. Locally increased echogenicity of omentum around the pyloric region is noticeable. For initial treatment, ceftriaxone(20mg/kg-q12hr), metronidazole (15mg/kg-q12hr), and fluid therapy with antiemetic drugs for five days was prescribed. after that, the case was still anorexic. A gastrointestinal endoscopic examination was performed, and a proliferative mass was found in the pyloric outflow tract. Multiple biopsy samples were taken with grasping forceps and were sent to a pathologist. Histopathological scrutiny revealed the existence of notable aggregates of poorly defined initiative neoplastic cells in all layers of the stomach with high nuclear and cellular pleomorphism and mitotic index accompanied by signet ring cell formation, individual necrotic cells, lymphoplasmacytic infiltration, and invasion of neoplastic cells into lymphatic. To confirm the origin of neoplastic cells, IHC staining was performed. Canine gastric





adenocarcinoma (mostly signet ring type) was the final diagnosis. The treatment combination of surgery and chemotherapy was done. Pre-medication anesthesia was started with ketamine (4 mg/kg) and diazepam (0.2 mg/kg). Induction of surgery was with midazolam (0.2 mg/kg) and propofol (2.5 cc). Isoflurane was used for maintenance. Billroth 2 (partial gastrectomy) was performed, and some parts of the stomach around the pylor were removed. Postoperative drugs were ceftriaxone (20 mg/kg-q12hr), metronidazole (15 mg/kg-q12hr) for 5 days. Carboplatin chemotherapy (250 mg/m<sup>2</sup> for the first injection and then 200 mg/m<sup>2</sup>, three times during ten weeks) was done. After the treatment period, monthly check-ups showed no signs of any problem within the gastrointestinal system. Canine carcinoma is the most common gastric neoplasm in dogs. Canine gastric carcinomas can assume a wide range of forms, but they mostly have the features of tubular adenocarcinoma. Surgery is the only potentially effective treatment for localized canine gastric carcinoma, and partial gastrectomy is usually indicated for this malignancy. This case report describes clinical features, imaging studies, endoscopic characteristics, histopathological features, and successful treatment of canine adenocarcinoma of the stomach in a dog.

Key words: Adenocarcinoma - endoscopy - Histopathology

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## Report Of A Rare Case Of Malignant Fibrous Histiocytoma Of The Giant Cell Type In A Cat

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A 17-year-old male DSH cat was referred to Persian pet clinic, Tabriz, Iran in March 2022. The patient had a history of noise, anorexia, salivation and refusal to eat. In intraoral examination, there was a lobulated flesh like mass in lower buccal cavity of left mandible with lobulated surface, and color similar to normal mucosa with  $3 \times 1.5 \times 1.5$  cm in diameter between internal surface of premolar and molar teeth and base of tongue. There was no invasion and metastasis. The most prominent histological feature was the presence of numerous multinucleated giant cells scattered among malignant-looking mononuclear tumor cells. IHC test was positive for vimentin. MFH was confirmed by histopathologic study.

Key words: Pleomorphic sarcoma, malignant fibrous histiocytoma, mandible, Cat

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## **Induction Of Experimental Endometriosis In Rat; Evaluation Of Systemic Inflammatory Response And Liver Tissue Change**

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Nowadays non-alcoholic fatty liver disease (NAFAD) is considered as a serious problem in human societies. The current study, while inducing experimental endometriosis in rats, evaluates changes in some parameters of general inflammation and changes in liver histology during and after endometriosis. So, twenty nine rats were used for this study. In all animals the endometriosis model was prepared by suturing parts of the uterine horn wall to the mesenteric gut. Four weeks later and under general anesthesia, in half of the animals endometrial cysts were surgically removed and they were kept for four weeks later (group II). At the same time (4 weeks after endometriosis induction), the other half of the animals (group I) were euthanized and induced endometriosis cysts and some fragments of their liver were used for histopathological evaluation. In addition, hematobiochemical evaluation was performed. In addition, in the group II, similar evaluative investigations were performed 8 weeks after experimental surgery. Significant increase in triglyceride, LDL, AST, ALP, ALT and estrogen parameters was observed in this study ( $P<0.05$ ). Whereas, total white blood cell count, lymphocyte, PCV and HDL counts decreased significantly ( $P<0.05$ ). In histopathological evaluation, induction of endometriosis was confirmed at the microscopic level, but no evidence of fatty liver or hepatic inflammation was found. Despite notable changes in some hematobiochemical factors in rats with experimental endometriosis, there was no evidence of fatty liver and hepatic inflammation. Therefore, there may be no association.

Key words: Experimental endometriosis, Inflammation, NAFAD

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## Foreign Body And Intestinal Intussusception In Dog, A Case Report, Diagnosis And Its Treatment

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A Husky Puppy were referred to clinic with clinical symptoms include anorexia, dehydration, depression, abdominal pain or discomfort, and vomiting. In the abdominal Palpation, there was no evidence of the foreign body, but the heavy accumulation of gas was felt in the cecum and colon. In the radiology evaluation of the abdominal area, the accumulation of gas and liquids in the proximal part of the abdominal cavity was known. The radiograph also indicated the complete obstruction of the small intestine. The patient's blood circulation was initially stable using fluid therapy and prophylactic antibiotics were also prescribed. Then, for accurate diagnosis and treatment of the patient, in the exploratory celiotomy was about 30 cm swallowed by the animal caused intestinal intussusception to be removed from the jejunum. Dogs and cats may ingest foreign bodies (FBs) that cause intestinal obstruction, which is one of the most common intestinal disorders requiring emergency surgical treatment. Life-threatening complications result because of fluid, acid-base, and electrolyte imbalances, hypovolemia, and toxemia. Dogs, especially young dogs may ingest a large variety of nonlinear FBs. Young dogs commonly chew on objects, and the recent disappearance of an object may raise suspicion of intestinal obstruction. The differential diagnosis includes acute gastritis, intussusception, acute pancreatitis, peritonitis, and parvoviral enteritis in young dogs. Simple intestinal obstruction may cause an increase in the intraluminal pathogenic bacterial population as a result of stasis or loss of the migratory myoelectric complex, which helps move intestinal contents distally and



keeps bacterial numbers low. Duodenal and proximal jejunal obstructions may be associated with vomiting of intestinal contents containing hydrochloric acid and pancreatic secretions rich in bicarbonate, which results in mild metabolic acidosis and dehydration. Diagnosis of intestinal distention may be aided by use of the ratio of maximum intestinal diameter to the height of the body of the fifth lumbar vertebra at its narrowest point. In questionable cases, diagnosis requires examination of the intestinal tract with contrast enhancement. A radiolucent area surrounded by contrast material outlining the FB may be visualized. Dilution of the barium suspension can be seen in a distended, fluid filled, proximal intestinal segment. Treatment of FB-induced intestinal obstruction is achieved by exploratory celiotomy. Preoperative stabilization of the patient includes antibiotic prophylaxis and management of fluid, acid–base, and electrolyte imbalances.

**Keywords:** foreign body, dog, intestinal intussusception, exploratory celiotomy

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## **An Atypical Diaphragmatic Rupture With Hepatic Torsion: A Case Report**

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Diaphragmatic hernia may be primary (congenital) or secondary (traumatic). In the secondary form because of the injured abdominal wall, the continuity of the diaphragm is disrupted. Consequently, abdominal organs move into the thoracic cavity and the lungs collapse rapidly. The case was an unvaccinated 6-months old mixed breed dog, referred to the FVM-UT with chief complaint of respiratory distress. In clinical examination, paradoxical breathing was noted and Cardiac sound could not be auscultated on the right side of thorax. In order to help evaluate the possibility of Canine Distemper Virus infection, a rapid diagnostic kit was used and the result was negative. Lateral and dorsoventral projections of the thorax showed extensive bilateral pleural effusion. Abdominal ultrasonography rolled out portosystemic shunt. Complete Blood Count and serum chemistry profile were normal. Echocardiography was performed to further evaluate the cardiovascular system (especially right side of the heart) and no abnormality was detected. About 400cc of the fluid was evacuated through thoracocentesis which had a bloody appearance. The sample was sent to lab and it was diagnosed to be modified transudate mixed with hemorrhage. The patient's breathing pattern improved significantly after thoracocentesis. Diuretics and antibiotics were prescribed for a week. In the next examination, recurrence of respiratory distress was evident. Therefore, the case was referred to the surgery section to place a chest tube. Computed tomography of the thorax and abdomen was performed before surgery. CT scan confirmed the presence of diaphragmatic hernia with torsion of hepatic lobes, dislocation of the spleen below the heart and swirl sign of mesentery. Due to the massive effusion of fluids into the Pleural Cavity, the diagnosis of Diaphragmatic rupture and dislocation of abdominal organs into the thoracic cavity was hardly possible through plain radiography and was not detected by two board certificated radiologists who had previously seen radiographic projections and this shows the importance of CT Scan evaluation in this case. Due to the unstable status of the case, it was decided to perform an emergency surgery. Because of the hepatic torsion, the liver had become strangulated and cyanotic, with round edges and fragile parenchyma and adhesions to the surrounding tissues. Blood vessels were severely congested. Diaphragmatic hernia



and liver torsion were corrected. Chest tube was removed 3 days after surgery and patient's general condition was satisfactory.

**Key words:** Diaphragmatic hernia, Dog, Hepatic Torsion, Diaphragmatic rupture

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## **Report Of A Large Aural Hemangiopericytoma Mass In A Sarabi Dog**

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Hemangiopericytoma in dogs (CHP) is a soft tissue neoplasm that originates from the pericytes or subcutaneous perivascular cells, and is often seen on the limbs as limited solid nodules. The microscopic characterization of this type of neoplasm is spindle-shaped cells with the cytoplasmic process which are arranged in whorls around the blood vessels, and the neoplastic cells form a "fingerprint" pattern. A three-year-old Sarabi male dog with a very large, firm, greyish-white mass measuring 23 × 18 × 13 cm on the right side of the face, attached to the



ear was referred to the surgery department of the Veterinary Teaching Hospital of Ferdowsi University of Mashhad. The surface of the mass was ulcerative. Most parts of the mass had a necrotic appearance. After preparing the animal, the mass was excised surgically. Due to the large size and weight of the mass, excision was performed in several stages using monopolar electrocautery. After incising the mass and its intact margin, due to probable vertical ear canal involvement, it had been resected with the Vertical Ear Canal Ablation technique, too. Finally, for histopathological evaluations, samples were sent to the pathology department. The proliferation of spindle-shaped cells around the capillaries and the perivascular whorls were seen. Also, mild infiltration of inflammatory cells and fibroplasia were observed. Finally, on the basis of histopathological findings, the mass was diagnosed as canine hemangiopericytoma. After the surgery, the patient's health status was monitored for up to three months and no signs of metastasis had been observed in examinations, and the outcome of the surgery seems satisfying.

**Keywords:** Canine, fingerprint pattern, hemangiopericytoma, histopathology, neoplasia

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## Evaluation And Comparison Of Two Common Techniques For Correction Of Entropion Surgery In 12 Dogs

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Entropion is inward rolling of the eyelid margin and it is a common problem in dogs , which is one of the most common eye problems in dogs. This complication can cause corneal damage and eye irritation, resulting in tears. The aim of this study was to evaluate the outcome of surgical management of entropion of the lower eyelids in shih tzu dogs. 12 shih tzu dogs with a median age of 10 months (min 6 ,max 12) months which were referred to private pet clinic. All dogs were generally in good health and had no eye infections. They were divided into 2 groups. All dogs fasted 6 hours before surgery. Anesthesia was included with ketamine %10 and diazepam then one group underwent surgery with the Hotz-Celsus technique and other group underwent surgery by the y to v plasty technique. Postoperative follow up showed that Hotz-Celsus technique had good results and recovered sooner than other technique.

Key words: Entropion, surgery, shih tzu

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## Cystolithectomy Surgery In A Shih Tzu-Terrier Female Dog

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One of the cases observed in different breeds of dogs, both at a young age and in old age, is urinary stones. Struvite stones (magnesium ammonium phosphate) and calcium oxalate stones are the most common urinary stones in dogs, followed by urate, silicate, cystine and a combination of stones. A 7 years old female dog, a Shih Tzu-Terrier, with pollakiuria was referred to the clinic for one month. With initial examination, radiologic imaging and ultrasound were suggested. In the obtained radiograph, a large number of stones of different sizes were observed. Due to the lack of food intake by the animal, serum therapy was performed with a Dextrose and Sodium Chloride solution. After the condition of the animal was stable, pre-anesthesia was performed with acpromazine at a dose of 0.2 mg/kg and ketamine at a dose of 5 mg/kg. Finally, ketamine and diazepam at doses of 10 and 0.5 mg/kg were used by induction and to continue the anesthesia of isoflurane by inhalation. After cutting the midline of the abdomen and cutting the bladder, a large number of stones at different sizes were removed. Finally, the bladder and urethra were flushed with saline. The sample was sent to the laboratory and the structure of struvite (magnesium ammonium phosphate) and infectious stone was reported. Treatment with ciprofloxacin at a dose of 20 mg/kg every 24 hours and orally for 10 days was recommended. The clinical importance of bags with urinary tract involvement is due to infections of different parts of the urinary system with a focus on urinary stones and paraclinical tests.



Keywords: urinary system, urinary stones, struvite, dog

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## **Macroscopic Evaluation Of The Effect Of Low-Level Laser And Plasma Jet On Wound Healing In Rats**

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The aim of this study was to evaluate and compare the macroscopic effect of low level laser and plasma jet for wound healing in rats. The study was performed on 40 old male white rats with an average weight of 250 g and an average age of the same age. After preparing the rats from Ibn Sina Research Institute, they were kept the same for one week under environmental conditions such as temperature, humidity and light, and nutrition such as the type of diet and the number of meals. Then, to start the research, rats were randomly divided into



two groups (A): laser treatment of wounds, group (B): plasma wound treatment. All rats were inhibited 4 hours before each anesthesia under conditions of abstinence and up to 2 hours after drinking water. Rats were anesthetized by intraperitoneal injection of ketamine 10% and xylazine 2%. After scrubbing between two shoulders of each rat, a circular wound was created by sterile 5 mm biopsy puncture. Group A rats were treated with low level laser in three sessions (each one 5-7 minutes) and group B in three sessions (each one 2 minutes) with argon plasma. Based on the wound contraction and observed results, it seems that Low level laser radiation has more acceptable and appropriate effects than cold plasma on the healing of rat skin wounds.

Keywords: Wound healing, Low level laser, plasma jet

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## **Report of diagnosis and treatment of a rare case of transmissible venereal tumor in the soft palate of a Siberian husky dog**

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Canine Transmissible Venereal Tumor (TVT) is a type of contagious and life-threatening cancer in which that neoplastic cells distributed via coitus in dogs. A 14-year-old, intact, male, Siberian husky weighting 21 kg, was referred to the Veterinary Medicine Hospital of Ferdowsi University of Mashhad, with sign of dyspnea, epistaxis, mucosal discharge from aoral cavity and anorexia. According to the given history, the dog had not improved after several antibiotic therapy courses and wound management in the past month. Clinical examination of the head and oral cavity showed, unilateral nasal hemorrhage, swelling of the pharynx and larynx, and purulent discharge from a defect (3.9cm x 2.3cm) in a mass on the soft palate. Granulomatous inflammation was also found in the radiological evaluation of the pharynx and larynx. In order to precise evaluation of the lesion, the animal underwent general anesthesia. After wound debridement and lavage, a smear was taken from the tissue of the affected area and also tissue samples were also obtained for the histopathological assessments. A gastric tube was inserted to prevent contamination and anorexia due to the oral lesion. Examination of the smear demonstrated the presence of a large number of round cells with basophilic cytoplasm containing intracytoplasmic vacuoles, eccentric round nucleus with distinct nuclei, that confirmed the presence of TVT. Vincristine sulfate and broad-spectrum antibiotics were administered. The mass was significantly smaller (0.75cm x 0.5cm) and the clinical symptoms were greatly reduced after two weeks, treatment. Side effects were not manifested during the treatment period. Our report is one of the few findings of primary TVT with soft palate involvement. Primary extragenital involvements such as cutaneous, ocular, nasal, oral lesions are rare but this neoplasm should be listed in differential diagnoses of extragenital masses in dogs. Neutering of affected and healthy dogs may prevent further transmission of TVT.

Keywords: Venereal Tumor, Soft palate, Vincristine, Neuter

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## **Bronchioloalveolar Carcinoma In An 11-Years-Old Persian Cat**

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Primary lung tumors in the cat are considered rare, with adenocarcinomas being the most common primary pulmonary tumor in this species. Adenocarcinomas account for >50% of feline primary pulmonary neoplasms; Less common primary neoplasms include squamous cell carcinoma and adenosquamous carcinoma. Feline pulmonary tumors have metastatic rates ranging from 76–80%, with a variety of metastatic targets. including skeletal muscle, eyes, and aorta. Analyses of the influence of age revealed that the odds of cats developing an adenoma or adenocarcinoma increased with age. An 11-year-old neutered female



cat with severe lethargy, dyspnea, open mouth breathing, and cachexia was referred to Kerman Veterinary Hospital. In clinical examination, dyspnea and tachypnea, muffled respiratory sound with 4/6 Heart murmur was noted. A radiological survey revealed hepatosplenomegaly, interstitial alveolar pattern, and generalized increased opacity of lung lobes. The presence of pleural effusion and two oval shape soft tissue masses, one in the anterior mediastinum adjacent to sternal lymph nodes and the other in the dorsal lobe was reported. In addition, in the laboratory examination, anemia, mild shift to left leucocytosis, and in the biochemical evaluation, elevated creatinine level (4.2), hypokalemia and hyperphosphatemia were seen which resembled chronic renal failure. The emergency critical care was started with oxygen therapy, hydrocortisone, fluid therapy, Aminophylline, and ampicillin-Clindamycin combination therapy. However, due to the unfavorable prognosis and clinical condition euthanasia was performed with the informed consent of the owner. In the autopsy, in addition to the two masses reported in radiology in size (2.5-2 cm) in the posterior lobe and mediastinal masses (0.5-1 cm), no distant metastases were observed in adjacent reticuloendothelial tissues. In histopathological examination, the occurrence of bronchioloalveolar carcinoma was confirmed. Lung lobectomy is the recommended treatment in patients without metastasis, with an overall median survival time ranging from 11 to 115 days. The caudal lung lobes appear to be more commonly involved. The treatment of choice for solitary primary pulmonary tumors in cats is wide surgical resection, and median survival times of 12–18 months are reported for cats with completely resected lesions. All cases of feline pulmonary carcinoma's which underwent surgical removal of the primary tumor died of metastasis and the prognosis of primary pulmonary neoplasm is poor, however, the prognosis of the mentioned case has been decreased by the coincidence of heart failure and chronic renal failure. The impact of chemotherapy in cats with primary lung tumors is not well studied, but one cat that received mitoxantrone following a lung lobectomy lived for 3 years after surgery.

**Keywords:** Bronchioloalveolar carcinoma, cat, Neoplastic disease

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## **Surgical removal of a grade one intraductal papilloma mammary tumor in a terrier dog.**

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On 9/9/1401, a 5-year-old terrier female dog was referred to the small animal surgery division, faculty of veterinary medicine, Shahid Chamran University of Ahvaz. During the clinical examination, the masses in the mammary glands of the inguinal region were touched. The patient was referred to the radiology department for radiographic and Ultrasonography examination of the abdomen. Ultrasonography reports indicated that the kidneys, bladder, liver, gallbladder, and other ventricular organs were normal, and no enlargement of lymph nodes in the abdomen was observed. Blood tests were performed to check for blood cells as well as biochemical factors, including liver enzymes, which showed high levels of urea nitrogen in the patient. Other cases had normal blood counts. In the first stage, ovariohysterectomy was performed on the patient and two weeks later, mammary masses were removed by unilateral mastectomy and tissue samples were referred to the pathology department. According to the pathology assessment, the type of mammary tumor was benign and was a grade one intraductal papilloma. Intraductal papilloma is a benign mammary tumor that consists of a fibrovascular nucleus covered by a large number of mammary epithelial and myoepithelial cells. After about 5 months of surgery, the patient was examined and there was no evidence of tumor recurrence or metastasis in other parts of the body. Dogs have the high-





est incidence of mammary tumors with significant differences compared to other species. About 50% of canine tumors are mammalian. Approximately 45% of mammary tumors in dogs are malignant, and 5 to 10% of mammary carcinomas in dogs are metastatic to bone tissues, including the axillary bones of the body, as well as the long bones. The cause of mammary tumors is unknown, however, factors such as hormones, genetics, nutrition and obesity are among the possible factors influencing the incidence of mammary tumors. Ovariohysterectomy before pubertal period reduces the risk of developing breast neoplasms throughout life, although recent studies suggest that ovariohysterectomy diminishes this benefit by increasing the risk of other neoplasms. The prognosis of mammary tumors depends on factors such as lymph node involvement, tumor size, cancer cell origin, and nuclear differentiation. In dogs, fatal tumors kill the patient in less than a year.

Keywords: mammary tumor, intraductal papilloma, ovariohysterectomy, dog

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## **Ventral bulla osteotomy due to an inflammatory nasopharyngeal polyp in a cat**

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A 5 months old DSH cat was referred to Nikan pet hospital and the clinical signs included: stertor, stridor and open mouth breathing despite previous antibiotic therapy in another veterinary center. For further para clinical evaluation, Computed tomography was performed under general anesthesia. Based on plain and post contrast CT scan examination of the skull, there was a large round soft tissue attenuation (size: 1.7\*1.2\*1.1 cm) in nasopharyngeal region which originated from right tympanic bulla associated with strong rim enhancement, osseous thickening and minimal-enhanced soft tissue attenuation in right tympanic bulla. Thus nasopharyngeal inflammatory polyp was definite diagnosis and ventral bulla osteotomy was selected as the treatment of choice. In the CBC before surgery, all cases were normal except for polycythemia which could be due to respiratory disorder. GA protocol for the operation included propofol (6mg/kg) induction agent and isoflurane for maintenance after endotracheal intubation. After the incision line was determined, the platysma muscle was incised and the digastric muscle was bluntly dissected from the hyoglossus and styloglossus muscles then the digastric and glossal muscles were retracted from the bulla. After the bulla was completely exposed, a micromotor drill was used to make a hole in ventral aspect of the bulla then the hole was enlarged with a rongeur. The polyp was removed completely and the cavity was lavaged with warm saline then the incision was closed routinely. The patient was recovered uneventfully and the foresaid cat was healthy at follow-up one month after surgery. Inflammatory polyps are non-neoplastic pedunculated masses that originate from the epithelium of the tympanic chamber or auditory tube. After lymphoma, inflammatory polyps are the second leading cause of nasopharyngeal disease in cats. Although Their causative agent being unknown, but it seems likely that an inflammatory episode, resulting in obstruction of drainage, is a possible underlying cause of the abnormal epithelial reaction. Using sole conservative treatment for inflammatory polyps is unsuccessful, therefore surgical treatment must be done.

Keywords: inflammatory polyp, ventral bulla osteotomy, cat.

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## **Noninvasive Treatment Of Urethral Obstruction With Uroliths In 14 Years Old Fertile Male Dog With Chronic Renal Failure And Enlarged Prostate; A Case Report**

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One of the routine cases of referring to a veterinary clinic is a uroliths problems. Struvite is the most common type of urolith in dogs, and calcium oxalate, calcium phosphate, urate, and cystine are less common. Complications of stones that remain in the urinary tract will include dysuria, infection, partial or complete obstruction of the urinary tract, and secondary kidney disease. This case report explained the successful diagnosis and treatment of urethral obstruction with uroliths in 14 years old fertile male German shepherd dog with chronic renal failure and enlarged prostate at the clinic. The animal showed signs of anuria, anorexia, and abdominal distention was observed. Biochemistry shows azotemia (BUN:146 mg/dl, Urea:312.6 mg/dl and Scr:6.02 mg/dl). Also, through abdominal radiography and ultrasound examination, the bladder and urethra were visualized with large volumes of crystals, confirming the diagnosis. For treatment, the patient was sedated with ketamine and diazepam. Under the guidance of ultrasound, the accumulation of uroliths in the duct was observed and a nelaton catheter (Number 12) was inserted as much as possible and the air was insuf-



flated, then by applying gentle external pressure to the bladder, urine was excreted with a large volume of uroliths and crystals. That was repeated several times until the white nelaton catheter (tip cut just up to the holes) reached the bladder and the duct was opened without severe injury. The bladder was lavaged 4 times with 60ml warmed up normal saline and the nelaton catheter was fixed on the position for 5 days. Ciprofloxacin, Prazosin, Dexamethasone (one dose), and saline normal infusion (1 Liter q12h) was prescribed for 5 days. After 5 days, a noticeable decrease in crystals in the bladder and urinary tract was evident on radiographs, and the patient was able to urinate without any problem.

**Keywords:** Urethral Obstruction, urolith, Noninvasive Treatment, Chronic Renal Failure, Enlarged Prostate.

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## **Reconstruction Of Bilateral Upper Eyelid Coloboma In Persian Cat Using Roberts And Bistner Technique**

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Upper eyelid coloboma is one of the congenital ophthalmic disorders which occurs due to defect in entire or part of the upper eyelid, it can



be unilateral or bilateral. In this report, reconstruction of bilateral upper eyelid coloboma using a Roberts and Bistner technique are reported. An adult female Persian cat was referred to the clinic with history of epiphora, conjunctivitis, blepharospasm and insufficient closure of eyelids in both eyes. In clinical examinations, trichiasis and bilateral palpebral defects were diagnosed. Corneal ulcer was detected by fluorescein strips. According to history and clinical examinations bilateral upper eyelid coloboma was confirmed. the patient went under surgery, in order to correct the defect using Roberts and Bistner technique. In this technique first, the upper eyelid recipient bed is debrided by resection of the colobomatous area. Rotational pedicle flaps are separated from the lateral region of lower eyelids to fill upper eyelids defects. Flaps are created with 3 step incisions; the first incision is at a distance of 1-2 millimeter from the edge of the lower eyelid. The ventral incision is also parallel to the dorsal incision and its distance from the first incision is adjusted large enough to close the defect of upper eyelid. Third incision is a vertical incision, which is close to the medical canthus of the eyelid. Then, the lower eyelid flap is rotated to cover the upper eyelid recipient beds. Finally, the lower eyelid flap is sutured to the recipient bed by vicryl 4-0 USB in simple interrupted pattern and the skin is sutured by nylon 4-0 USB in simple interrupted pattern. This technique provided adequate cosmetic and functional outcome for the patient. It also improved symptoms of conjunctivitis, epiphora and blepharospasm.

Keywords: cat, bilateral upper eyelid, flap

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## Trauma Induced Omental Evisceration In A Mixed Breed Puppy: A Case Report

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A two-month-old male mixed breed puppy with a trauma-induced finger-like lesion protruding from the abdominal skin for at least nine days was referred. Clinical examination confirmed average body temperature, lethargy, dehydration, and irreducible lesion in the abdominal area. The CBC report revealed Leukocytosis with regenerative left shift neutrophilia and moderate regenerative normochromic anemia. The lateral and VD projection of thoracic and abdominal radiography showed that the diaphragm was intact, and there were no abnormalities in the skeletal system. Abdominal ultrasonography revealed an intact urinary bladder with a standard wall thickness, normal abdominal organs and normal free fluid due to the patient's age. The appendage in the ventral aspect of abdomen contain structure with wall layering and vasculature nature in the circumference, more likely the segment of small intestine and surrounded omentum and fat. Surgery was performed after stabilizing the patient with IV fluid therapy and parenteral broad-spectrum antibiotics. After anesthesia and aseptic preparation, a midline celiotomy was performed to recognize the eviscerated tissue from the inside of the abdominal area. The eviscerated tissue was identified as a greater omentum, and a partial omentectomy was performed while preserving the viable structures. The eviscerated tissue was then carefully excised, and since there were no signs of peritonitis,



the incisions were closed in the usual manner after initial lavage with sterile saline. Broad-spectrum intravenous antibiotic therapy was prescribed to the patient for seven days. In subsequent follow-ups, the patient's condition was reported to be improving. Abdominal evisceration happens in the case of a hernia through the body wall and skin. This condition is divided into two major and minor categories. In major abdominal eviscerations, the herniation of most of the abdominal contents through the body wall occurs. However, in Minor abdominal evisceration, herniation of only the omentum or abdominal viscera without gross contamination happens. The reason for the evisceration was categorized as trauma or post-surgical dehiscence. The Prognosis is reported from Excellent to poor. Due to the patient's delayed referral after nine days, however, peritonitis was not observed, which could result from the defensive function of the highly vascularized omentum.

**Keywords:** Hernia, Evisceration, TAWH, Minor Evisceration, Greater omentum

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## **Partial Phallectomy In A German Shepherd Dog For Treatment Of A Penile Prolapse Associated With Preputial Skin Destruction Due To Myiasis Invasion: A Case Report.**

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Prolapse of penis is caused by some factors such as neurologic disorders, traumas and damages to prepuce, blood vessels injury or loss of preputial muscular tons. An almost 1-year old GSD with unknown history, referred to Oxygen veterinary hospital in Tehran. The owner complained about a wound around penis and protrusion of penis from 2 weeks before. Clinical examinations revealed a large wound full of myiasis and huge amount of dead and necrotic tissues with purulent discharges. Penis was protruded and too painful. Laboratory results showed huge neutrophilia. Wound management started, larvae removed from the wound, thoroughly irrigated with NaCl 0.09 %, topical antibiotic applied (silver sulfadiazine topical ointment), and systemic antibiotic therapy (vial Ceftriaxone q12h) started. Wound management performed twice a day without bandage and after the resolution of infection, prepuce skin reconstructed and partial phallectomy (standard text-book approach) were performed to resolve penile prolapse. A foley catheter placed for 10 days after surgery. Three days after catheter removal, urethral stenosis was detected. Urethral reconstruction performed and catheter was replaced for 2 more weeks. After foley catheter removal, patient could urinate normally and there was no more pain. At 6-months follow-up, the patient was able to urinate normally, there was no sign of penis and urethral protrusion and stenosis. Generally, identifying the underlying cause of penile prolapse and immediate treatment is necessary. Also, the amount of damage to the penile tissue has an important role in treatment planning.

Keywords: Penile prolapse-partial phallectomy-dog-surgery- myiasis

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## **Total Splenectomy Due To Segmental Splenic Infarction In A Dog**

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A 3-year-old male Shih Tzu was referred to the Faculty of Veterinary Medicine, University of Tehran, clinical signs included: abdominal pain, anorexia and lethargy. abdominal ultrasound and CBC were recommended. in the blood test, all parameters were normal except decrease in hemoglobin. The patient underwent abdominal ultrasound four times in a three-day period, during which time the free abdominal fluid increased significantly and hemoabdomen was diagnosed by FNA from the free fluid. In all ultrasounds, the spleen was normal in size but with a heterogeneous echotexture. on the third ultrasound, splenic vein was bulge with an echogenic structure at its entrance without any sign of blood flow. Spleen blood supply to the head and body was reduced, and there was no sign of perfusion in tail. According to the aforesaid data, splenic vein thrombosis with splenic infarction was finally diagnosed and splenectomy was chosen as the sole treatment. in the CBC before surgery a decrease in hematocrit, hemoglobin and red blood cells and an increase in white blood cells and erythrophagocytosis were detected, all of which are justified by splenic infarction and the presence of blood in the abdominal cavity. total splenectomy was performed without any complications and the patient recovered without any problem. Postoperative laboratory findings showed that all cases were normal except for leukocytosis, and there was no evidence of anemia, bleeding or infection. The patient was healthy at follow-up one month after surgery. Although total splenectomy can be done for many reasons, in this patient the cause of total splenectomy was a segmental splenic infarction and the thrombosis in the splenic vein. Segmental splenic infarction is rare in dogs representing 1% to 2% of lesions found histopathologically. It can be primarily due to decreased perfusion and venous drainage, as well as acute vascular obstruction due to infectious agents such as



hemobartonellosis. Although splenic infarction and splenic vein thrombosis are often accidental findings on abdominal ultrasound, they can be important in the diagnosis on underlying diseases.

**Keywords:** splenic vein thrombosis, segmental splenic infarction, splenectomy.

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### **A Case Report Of Facial Tvt In Two Dogs**

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Transmissible venereal tumor (TVT) is a sexually transmissible tumor which mostly affects intact, sexually active dogs of either sex all around the world. It is the most prevalent canine tumor in some parts of the world. Two cases were referred to a small animal clinic. One of them was a male husky-native Iranian mixed breed dog with signs of abscess and trauma in right maxilla. Routine hematologic exam-



inations didn't show any specific abnormality. Then the case was sent for radiographic examination. Soft tissue swelling was detected on the right-side nasal bone and the opacity of nasal sinus was increased with no bone involvement and active irregular periosteal reactions were evident in dorsal aspect of nasal bone which was more prominent in the right side. Permeative osteolytic regions were also detected. The case was also sent for abdominal ultrasonographic examination which revealed multiple large masses in abdominal cavity which were multifocal, encapsulated, highly vascular with different sizes. Fine needle aspiration technique was performed and the sample was sent for histopathological examinations. The results were consistent of nasal and abdominal TVT. Surgery was performed and the mass were removed. After the definitive diagnosis of TVT and a period of antibiotic therapy, five sessions of chemotherapy with vincristine sulfate with a dose of 0/025 mg/kg was performed weekly. The case was dismissed with no signs of tumors. The other case was a male native Iranian dog with severe head and face swelling and facial deformity. Radiography showed a severe aggressive bone periosteal reaction in dorsal aspect of the maxillary region and a soft tissue swelling in submandibular region. Lung parenchyma also had severe bronchial infiltration which could have been due to osteosarcoma and metastatic lymphoid bronchitis. FNA was performed and confirmed TVT. Unfortunately the case did not survive because of severe injuries. TVT is a benign tumor and is shown to respond quickly to treatment. Usually after confirmation of TVT by histopathological examinations the case is referred for surgery and then depending on histopathological results 4 to 6 sessions of chemotherapy with chemotherapeutic drugs such as vincristine sulfate and cyclophosphamide is recommended.

Keywords: Transmissible venereal tumor (TVT), Histopathology, chemotherapy, radiology

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## **A Case Report Of Diagnosis And Surgical Treatment Of Diaphragmatic Hernia In A Poppy Due To Traumatic Injury, 18 Months After Falling From A Height**

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Traumatic injury is one of the most common causes of diaphragmatic hernia in dogs. Diaphragmatic hernia is a situation in which the organs of the abdominal cavity enter the chest cavity. A 2-year-old male Shih-Tzu dog was referred to Ashian Clinic with symptoms of acute vomiting and anorexia. In the history of this patient, the animal fell from a height of 11 meters 18 months ago and was treated for head trauma. According to the radiologic findings at the time of referral, the diaphragmatic hernia, rotation of the spleen around the heart, and placement of the intestines on the right lung (and subsequent complete collapse of the involved lung) occurred. To stabilize the general condition, urgently, the animal underwent oxygen therapy and fluid therapy in the



intensive care unit for 15 minutes. Etomidate was used to induce anesthesia and then continued with isoflurane. 1-hour celiotomy surgery was performed through the ventral midline of the abdomen. During the separation of the intestines from the lungs, the intestinal obstruction with a foreign body (peach kernel) attracted attention (which was considered the cause of acute vomiting). Enterotomy was performed to remove the FB and the intestines were returned to the peritoneal cavity. Due to the lack of adequate space in the abdominal cavity during the growth of the patient, the spleen was completely removed by splenectomy. Before removing the spleen, a suitable volume of adrenaline is sprayed on this organ, to make constriction in the spleen and save the almost stored volume of this organ. It is worth noting that the lungs and the intestines involved were not particularly damaged. Finally, the two edges of the diaphragmatic rupture site are sutured in a simple continuous pattern as the usual way, then the peritoneal cavity was rinsed with a suitable volume of warm and sterile saline and the celiotomy incision was closed. The chest tube and the three-way valve were placed in the eight intercostal space, because of the presence of air in the pleural cavity. Due to the possibility of pulmonary embolism, the animal was monitored in the I.C.U. for 24 hours. Daily radiography, fluid therapy, and antibiotics were also performed for 5 days. In traumatic injuries, it is necessary to check the health status of the diaphragm, because early diagnosis improves the treatment process and can increase the patient's recovery.

**Key words:** Diaphragmatic Hernia, Falling from a height, Poppy, Celiotomy, FB.

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## **A Rare Case Of Multicentric Squamous Cell Carcinoma In An Old Boxer**

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Cutaneous neoplastic diseases are the most and second-most frequently reported tumors in male and female dogs, respectively. Squamous cell carcinoma (SCC) is one of the most common malignant cutaneous tumors in dogs. SCC can occur anywhere on the skin. The trunk, legs, scrotum, lips, and nail bed are the most frequent sites of occurrence in the dog. It usually affects older animals; no sex or breed predilection has been noted. Prolonged exposure to UV light is recognized to be an important factor in the development of SCC. Squamous cell carcinomas usually appear as a single, solitary lesion in one location, but there is a kind of SCC called multicentric squamous cell carcinoma (also known as Bowen's disease or Bowenoid carcinoma) that presents as many (two or more) lesions in multiple locations on the body. Multicentric SCC is very rare in dogs. Certain breeds are known to have an increased incidence of SCC, including Scottish Terriers, Pekingese, Boxer, and Poodles. A 9 years old boxer dog was referred to the veterinary hospital of the Shahid Bahonar University of Kerman, with multiple nodular skin lesions developed around the chin and under the neck, then spread to the limbs. The size of the lesions was 0.5 to 3 centimeters, and they were mostly ulcerative and the patient had lost weight in the last 3 months. The history of several collapses and faints was also reported by the owner. Based on the physical examination and ECG, arrhythmogenic right ventricular cardiomyopathy (ARVC) was suspected. The biochemical evaluation showed elevated creatinine (2.9), hypokalemia, and hyperphosphatemia which revealed the state of chronic renal failure. Surgical resection of two different large lesions was done for histopathological evaluation. Sections of the skin biopsies showed an infiltrative neoplastic proliferation into the deep dermis



composed of solid nests of malignant squamous cells with abruptly keratin pearl formation. Tumoral cells showed slight atypia with hyperchromatic nuclei and prominent nucleoli. The results showed a well-differentiated squamous cell carcinoma. Radiographs showed no distant metastasis into the lung, liver, and mediastinal lymph nodes. The mean age for diagnosis of squamous cell carcinoma is between 6 and 11 years old. Canine skin squamous cell carcinomas are typically only locally aggressive with a low potential for distant metastasis. Where the tumor is well-differentiated and can be completely excised, the prognosis is favorable. Conversely, the prognosis is poor if the tumor is inoperable or poorly differentiated, or has metastasized. Squamous cell carcinomas are not generally regarded as chemo-responsive and surgical excision is the primary treatment option in dogs. Wide surgical excision, with margins of at least 2 cm around the tumor, is usually curative. Radiation therapy is usually recommended in addition to surgery if the tumor is not completely removed. Unfortunately, in this case, based on multicentric form of tumor and aging problems, the owner wasn't interested in chemotherapy, and euthanasia was done.

Keywords: Multicentric squamous cell carcinoma, dog, skin tumor

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## **Treatment of bilateral hydronephrosis and hydroureter through Bilateral ureterolithotomy in a Persian cat**

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Ureteral obstruction in cats is uncommon. However, it disturbs the balance of acid-base and electrolytes, and so this condition is life threatening. Hydronephrosis and hydroureter are common sequelae of ureteral obstruction. A 5-year-old Persian female cat was referred to the Small Animal Hospital, Faculty of Veterinary Medicine, University of Tehran. Clinical signs of the patient was lethargy and anuria. Bilateral enlarged kidneys was detected in the physical examination. Hematocrit, hemoglobin and red blood cells were very low according to blood laboratory results and urea and creatinine were very high in the patient's biochemical panel. Ultrasonography revealed enlargement of both kidneys associated with severe hydronephrosis and hyperechoic floating contents in the renal pelvis. A calculi with length of 5/9 mm observed at proximal aspect of the right ureter and compact sludge with size of 1/8mm observed at third caudal part of the left ureter, which caused bilateral hydronephrosis and hydroureter with more severity in left side. Induction of anesthesia was performed with propofol and maintenance of anesthesia was performed by inhalation anesythasia using isoflurane. During exploratory anesythasia, it was observed that the right ureter is retrocaval. Bilateral ureterotomy using surgical microscope was used to remove the stones. A longitudinal incision was made in the ureter by ophthalmic knife and the stones were removed. the ureter was closed longitudinally using 8\_0 polyglactine 910. Post-operative re-examinations after one week revealed general good condition of the patient and clinical signs improved considerably. Post-operative follow-up examinations showed the patient's urea and creatinine levels were significantly reduced, and ultrasound findings showed improvement in the condition of the animal's kidneys and ureter. In 6 months post-operative examination, sings of hydronephrosis and hydroureter did not existed and the kidneys and ureter had returned to normal size. However, there were still underlying renal problems such as glomerulonephritis in the kidneys.

Key words: Hydronephrosis , Hydroureter , Urinary calculi , Ureterolithotomy , Cat

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## **Abdominal Hernia Repair In A Green Iguana (*Iguana iguana*): A Case Report**

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A 13- month-old green iguana (*Iguana iguana*), weighing about 1.5 kg was referred to the clinic with history of reversible soft tissue mass in the left flank. There was no other history note. Clinical examinations as well as ultrasonography of the suspected region confirmed an abdominal hernia, which contained intestines in inguinal sac. During clinical examinations, there was no adhesion between the hernial ring and its contents. The selective treatment of hernia is surgical closure of the ring. Before anesthesia, the animal was properly restrained and handled by tying its pelvic limb along with tail, in order to restrict their movement during procedure. While the animal was positioned into lateral recumbency without any complications, general induction of anesthesia was performed with isoflurane 4% by using mask and it was considered as a complete induction. Complete induction of anesthesia was completed in four minutes. Maintenance of anesthesia was



carried on with isoflurane 3%. The surgical site was draped after proper preparation and strict aseptic protocols. Vertical incision was made on the soft tissue mass. After relocating hernial contents, the hernial ring was sutured in two layers of simple continuous and simple interrupted pattern by polyglycolic acid 2-0 USB. Then, subcutaneous layer was sutured by polyglycolic acid 2-0 USB. Finally, the skin was sutured by nylon 3-0 USB in simple interrupted pattern. After operation and proper ventilation the iguana was recovered successfully and positioned into sternal recumbency in three minutes. Two weeks after surgery, sutures were removed and clinical examinations illustrated complete closure as well as healing of the abdominal hernia.

**Key words:** Abdominal hernia, Iguana, Inguinal ring, Anesthesia, Isoflurane

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## **Neuroprotective Effect Of Trimetazidine On Spinal Cord Ischemia-Reperfusion Injury In Rats**

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Paralysis is one of the most common clinical manifestations of trau-



matic and non-traumatic complications that occur in the spinal cord tissue. Increased production of reactive oxygen species, decreased tissue antioxidant capacity, and consequently, oxidative stress would induce ischemia-reperfusion injury. The present study aims to investigate whether Trimetazidine, an anti-ischemic drug, may protect against the deleterious effects of spinal cord ischemia-reperfusion injury. Twenty-four Wistar rats were randomly divided into 4 groups: Sham (under exploratory abdominal surgery stress), TMZ (Trimetazidine drug only), IR (under abdominal aortic clamping surgery), and IR+TMZ (Trimetazidine treatment followed by aortic clamping surgery). To induce ischemia-reperfusion, the abdominal aorta was closed under the renal artery for 40 min. Posterior motor function was evaluated by the Tarlov grading system at 4, 6, 12, 24, 48, 60 hours after injury. Also, oxidative stress parameters including malondialdehyde (lipid peroxidation index) and antioxidant capacity with iron reduction (FRAP) were measured. The neural function of the IR + TMZ group was significantly increased at all times compared to the IR group ( $p < 0.05$ ). IR + TMZ group at 4 and 6 hours after surgery was significantly different from sham group and TMZ group but in the following times, no significant difference was observed. Malondialdehyde levels in the spinal cord tissue were significantly increased in the IR group compared to the TMZ group ( $p < 0.01$ ) and IR + TMZ group as well as Sham group ( $p < 0.05$ ). The antioxidant capacity of the TMZ group was significantly higher than the Sham group and IR + TMZ group ( $p < 0.05$ ) and ( $p < 0.01$ ) respectively. The results of this study indicate that Trimetazidine can be effective in reducing spinal cord tissue injury by reducing the production of free radicals due to oxidative stress in spinal cord ischemia-reperfusion injury.

**Keywords:** Trimetazidine; Ischemia-reperfusion injury; Spinal cord; Rat; Malondialdehyde; FRAP

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## A Case Report Of The Occurrence Of Unilateral Hydrometra In A British Short Hair Cat

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Hydrometra is an accumulation of watery fluid inside the uterus. Hydrometra is asymptomatic in cats and is associated with an increased uterine endometrial secretory activity. On January 10, 2022, a 14-month-old British short-hair female cat came for elective Ovariohysterectomy surgery. The history of this case was that the first estrus was at 8 months, she became pregnant at 9 months, and at the time of delivery, after the first fetus was severely delivered and died, the patient underwent c-section due to dystocia, and the other two fetuses died shortly after delivery. After weighing and initial examination, the case was anesthetized with the protocol of xylazine (pre-medication), a combination of ketamine and diazepam (induction) and inhalation anesthesia was used to continue anesthesia. After entering the peritoneal cavity and trying to find the right uterine horn, the abnormal enlargement of it attracted attention. After ligation of the right ovarian pedicle and exteriorization of the uterine horn from the relevant position, a sample was taken from the contents inside the uterine horn under the principles of sterility, and with blood sample was sent to the clinical pathology laboratory for cytological evaluation and blood analysis. OHE and closure of celiotomy incision were performed as usual. It is worth noting that due to the doubt of pyometra, the uterine body was sutured with a Parker-Kerr pattern. The patient's blood test showed no abnormal findings, and cytologic analysis of the sample obtained from the contents showed the presence of transudate with a small number of neutrophils, macrophages, and a very small number of cocci. The smear prepared from the affected tissue and its microscopic examination showed only congestion in the endometrium and myometrium and no abnormal findings were reported. Macroscopic examination of the two uterine horns using ImageJ software was as follows: The length of the right uterine horn (24.62 cm) was 2.86 times the length of the left horn (5.58 cm) and the diameter of the right horn (5.99 cm) was 3.18



times the diameter of the left horn (1.88 cm). After surgery, the patient was treated with NSAIDs for 3 days and antibiotics for 5 days. The presence of these fluids was identified as related to the uterine reaction following the presence of a foreign body (suture). The inability to excrete the secretion was considered damage to the cervix during labor.

**Keywords:** Hydrometra, cat, British short-hair, Ovariohysterectomy surgery.

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## **Hepatocellular Adenoma In A 7-Years-Old Siberian Husky Dog**

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Hepatocyte adenomas are benign tumors that grow in a symmetrical pattern and never metastasize. They have an oval shape and pressure equally on the adjacent parenchyma, although they are not invasive. A neutered 7-year-old male Siberian husky was referred to the Veterinary hospital of Shahid Bahonar University with a history of progressive



abdominal distension and dyspnea. Clinical findings included paleness and slight mucous membrane jaundice, hind limbs edema, 3/6 cardiac murmur with right-side heart enlargement (ECG diagnostic), and severe ascites. In the laboratory investigation, hyperglobinemia, a notable increase in alkaline phosphatase and alanine aminotransferase, total bilirubin, and a significant decrease in the level of total protein and serum albumin were detected. There was considerable ascites and heart size enlargement on the radiographic survey but no evidence of pleural effusion and pulmonary edema was noted. After abdominocentesis and pulling off 5 liters' of peritoneal fluid, ultrasonography indicated multiple nodular lesions of varying sizes on the liver's surface. Conservative treatment with hydrochlorothiazide and furosemide, lactulose, Livergol, Marbofloxacin, and Enalapril was started. The possibility of a primary liver tumor was considered due to the progression of jaundice and ascites, so laparotomy and it was decided to sample the lesions by exploratory laparotomy. Many nodular non-pedunculated lesions (about 50) which had a clear demarcation from surrounding tissue and sized between 0.5-2 cm were found during surgery. No signs of tumor invasion in adjacent organs and lymph nodes were noted. Due to the presence of several hepatic nodular lesions and unknown prognosis and based on the request of the pet's owner, euthanasia was done. On histopathological evaluation, nodular lesions had well-defined and surrounded by a thin capsule of connective tissue. Hepatocytes were regular and had moderate to severe steatosis in their cytoplasm. There was no increase in mitotic index, atypia, and polymorphism in the cell nuclei. There is no known etiology for hepatic adenoma in domestic animals, although carcinogenic chemicals may be involved in the occurrence of these lesions. Although the tumor was benign severity of hepatic lesions caused hepatic failure in the mentioned case.

Keywords: Hepatocellular adenoma, Dog, Hepatic failure

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## **Report Of A Malignant Sweat Gland Carcinoma In A Shih Tzu**

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Sweat glands in dogs are a type of apocrine glands. Adenocarcinomas of theocrine glands make up only a small fraction of sweat gland neoplasms. Dogs have different percentages of glandular lesions in different breeds. Sweet gland carcinoma is one of the most malignant types of lesions of these glands that appear as slow-growing papules or nodules in cutaneous or subcutaneous form and without pain. The tumor has no epidermal attachment and is composed of polygonal epithelioid cells with variable eosinophilic cytoplasm and nuclear pleomorphism. Transparent cell changes and paving characteristics may also be present. In a 12-year-old male Shih Tzu dog, after clinical observations, a lump in the neck area was referred to the laboratory for histopathological evaluation. After excisional biopsy and tissue sampling, the sample was stained using H&E. By studying the slides prepared from the lesion, malignant changes, mitotic forms, proliferating epithelial cells, cell pleomorphism, hyperemia and inflammatory cells in the skin were observed and the diagnosis of sweat adenocarcinoma was reported. After relaxing and shaving the affected area and performing sterilization procedures before surgery, designated units of diazepam and ketamine were injected into the patient for complete anesthesia, and finally the mass was completely removed from the neck area with surgery.

Key words: Sweat gland, tumors, dogs

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## **Report of co-occurrence of cavernous hemangiomas and Eruptive vellus hair cysts in a Pekingese**

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Hemangiosarcoma cavernous (HSA) is the most common form of malignant tumors that affect blood vessels in different parts of the body and are divided into three categories of skin, subcutaneous and visceral in terms of replacement in different tissues of the body. They are usually asymptomatic. This happens when too many blood vessels form at one point. Hair cyst (EVHC) is a neoplasm of skin cells or follicular growth abnormalities that mostly affect the chest, limbs, and abdomen. In a 7-year-old male Pekingese dog, after clinical observation, a lump in the cranial region of the chest was referred to the laboratory for histopathological evaluation. After performing tissue cutting methods, it was finally stained using H&E. By studying the prepared tissue incisions, he showed vascular and bloody proliferation and the formation of lobular patterns and small skin cysts containing numerous excess hairs and the penetration of inflammatory cells into the skin covered by squamous epithelium. In the operation, 5 cc of rampon (1 kg / mg) was





injected to the patient for complete resection of the mass for anesthesia. After the patient was sedated, the skin of the lesion area was repaired and sterilized and the patient was prepared for surgery. The mass was located in the cranial region of the chest and an electrocautery device was used during surgery to prevent severe bleeding. Certain units of diazepam and ketamine were also injected into the patient during surgery. Accurate identification of masses and visceral tumors is done by preparing a tissue sample and histopathological evaluation. Due to the risk of malignant changes in some tumors, surgery and complete removal of the mass from the area is recommended.

Key words: cavernous hemangiomas, cyst, Dog

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## **Sinonasal Chondrosarcoma In A Dog – A Case Report**

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In April 2021, a seven-year-old male, large mixed-breed dog was pre-



sented to the Department of Surgery and Radiology, Small Animal Hospital, Faculty of Veterinary Medicine, University of Tehran. The patient suffered from facial deformity, nasal swelling, hemorrhagic and mucopurulent nasal discharge, and anemia. Simple and post-contrast CT scan revealed an invasive heterogeneous mass completely occupying the left nasal cavity, invading the right nasal cavity, and deviating and destructing the nasal septum. Destruction of the turbinates and lysis of the nasal and cranial bones, from the frontal bone to the palate, complete obstruction of the left nasopharynx, and right submandibular lymphadenopathy were other CT scan findings. The patient underwent surgery to have the tumor removed. It was anesthetized and placed in sternal recumbency. Removal of the tumor was achieved by dorsal rhinotomy, utilizing osteotome and oscillating saw. Since the tumor adhered to the nasal mucosa, significant bleeding accompanied surgical removal. Hence the procedure was performed quickly to reduce post-procedural complications. As the mass was removed, bleedings were highly reduced. Mild bleedings were controlled by epinephrine-soaked gauzes. The elevated bone was secured with cerclage wires, then subcutaneous tissues and skin were closed routinely. A white-yellow and firm tissue was referred to the pathologist. Histopathologic examination revealed severely pleomorphic haphazardly arranged spindle-shaped or polyhedral to oval chondrocytes, possessing plump nuclei, prominent nucleoli, and mitotic activity (5 / 10 HPF), within a translucent chondroid and fibrillar matrix, with foci of myxoid matrix deposition, leading to the diagnosis of chondrosarcoma. Prominent blood vessels, remarkable multifocal hemorrhage and hemosiderosis, multifocal mineralization, and neutrophilic and lymphoplasmacytic infiltration were other remarkable histopathologic findings. The overlying respiratory epithelium confirmed its anatomic origin as sinonasal chondrosarcoma. The chondroid matrix was demonstrated by Alcian blue and Safranin O / Fast green stains. Immunostaining (SATB2) confirmed the diagnosis. Unfortunately, the patient died after 7 months due to recurrence of the neoplasm and severe suppurative inflammation of the upper respiratory tract. Chondrosarcoma commonly involves flat bones in dogs and humans and is more frequent in ribs, turbinates, and the pelvis. In a 20-year study of canine sinonasal tumors, only four cases of sinonasal chondrosarcoma were observed, two of which had caused significant head and facial deformity.

Keywords: Dog, Rhinotomy, Chondrosarcoma, Special staining, Im-



munohistochemistry, Surgical pathology

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## Removal Of Nasal Polyps Along With Unilateral Rhinoplasty In A Persian Cat

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Feline inflammatory polyps (FIPs) are the most common nonneoplastic pedunculated growths found in the ear canal or nasopharynx in cats. They are presumed to originate from the epithelial lining of the tympanic bulla (aural inflammatory polyps) or the auditory tube. When they originate from the auditory tube, they can grow into the tympanic cavity (middle ear polyps) or the nasopharynx (nasopharyngeal polyps) or, less frequently, in both directions. Bilateral polyps have been reported but are uncommon. Stenotic nare disease happens due to anatomical stenosis in brachiocephalic dogs and some breeds of cats. A 4-year-old spayed male Persian cat was referred to the small animal hospital of the faculty of veterinary medicine, University of Tehran. Clinical signs included: respiratory distress, abnormal respiratory sounds, cough, nasal discharge, and exercise intolerance. There were no signs of neurologic disorders. In the examination, the right nare had stenosis condition. Blood analysis was normal except MCV and platelet that were decreased (MCV=40.50fl, PLT=109.3\*10<sup>3</sup>/μl). Under general anes-



thetia with precise examination, bilateral nasal polyps with the size of 2\*4 mm were diagnosed (right polyp was 1mm larger than the left) and removed by using traction-avulsion technique then, right side rhinoplasty(wedge-shaped) was performed. After several weeks the patient had a good general condition with no complications and all the symptoms had been diminished.

Keywords: nasal polyp, nare stenosis, rhinoplasty

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## Successful Surgical Report Of A Rare Case Of Gastrothorax And Gdv In A Domestic Shorthair Cat

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Gastrothorax is a rare condition in dogs and cats that can be life-threatening and due to a defect in the diaphragm and the relative pressure difference between the thoracic cavity and the abdominal cavity, the organs of the abdominal cavity enter the chest. The effect of a congenital defect is such that the pleuroperitoneal membranes are defective in closing the pleuroperitoneal canal can also occur following trauma and rupture of the diaphragm. Congenital diaphragmatic defects include



peritoneal hernia, hiatal hernia, and rarely pleuroperitoneal hernia, and there are only a few veterinary reports of congenital pleuroperitoneal hernia. The organ most commonly herniated is the liver, followed by the small intestine, omentum, stomach, and spleen. In particular, if the stomach is herniated into the thoracic cavity, it is blocked by the rotation of the inlet path (esophageal-gastric junction) and the stomach is dilated by gas and fluids, displaced by mediastinum and pressure on the lungs, heart, arteries, and veins. The vitality of the body leads to difficulty in breathing, chest pain, shock, cardiac arrest and death. In January 2021 An 18-month-old male DSH cat was referred to a Veterinary clinic due to an accident with clinical signs of dyspnoea and respiratory distress. In the Clinical examination detected tachypnoea and orthopnoea in right lateral recumbency. Decreased lung sounds and hyper-resonance of the left hemithorax were appreciated during thoracic auscultation. The heart sounds were displaced cranially and to the right. In the lateral radiograph of the thoracic cavity, the presence of a dilated stomach in the chest was detected. After restraint, fluid therapy and oxygen therapy, the patient's owner decided to undergo midline celiotomy. Induction of anesthesia was performed after relaxation of the preparation with ketamine diazepam. The animal was then connected to an inhalation anesthesia device to continue anesthesia with isoflurane gas. In exploratory celiotomy, a midline rupture was seen in the left side of the diaphragm with a gas hernia, which was full of gas and twisted into the chest. Wet to remove the stomach twist and gently pull the herniated visors back and not remove the tissue due to the lack of necrotic tissue. With simple universal suture pattern with absorbable suture 0-2 polydioxanone Was stitched celiotomy incisions were usually sutured in three layers. Antibacterial therapy was prescribed post-operatively at the discretion of the surgeon. Analgesics were prescribed to improve breathing and the patient recovered completely after one week.

Rupture of the diaphragm and hernia of the gastrointestinal tract is a common complication in cats, but complete gastric hernia, gastric bypass, and gastric distention are rare during this complication.

Keywords: Surgery, gastrothorax, Hernia, Stomach , GDV

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## **Report Of 13 Cases Of Perineal Urethrostomy And Their Prognosis One Year After Surgery**

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Feline lower urinary tract disease (FLUTD), formerly known as cat urological syndrome or FUS, is very similar to urinary obstruction but is a complex disease with many causes. Feline idiopathic cystitis (FIC) or interstitial cystitis is the most common cause of cat's lower urinary tract disease (FLUTD). Other causes of FLUTD include stone blockage of the urethra, urethral obstruction, bacterial cystitis, urinary tract neoplasia, or urinary tract infection. Clinical symptoms associated with this disease include hematuria, straining during urination, untimely urination, polyuria or hyperuricemia, anuria, urinary obstruction in males, and excessive licking of the urogenital area. Urinary tract obstruction in cats is an emergency and should be treated immediately. Unfortunately, cats with urinary incontinence are more likely to have their urethra blocked again. These cats are often advised to have surgery called a perineal urethrostomy (PU). Perineal urethrostomy is a surgical procedure to reduce urethral obstruction in cats with recurrent lower urinary tract obstruction. The aim of this study was to evaluate the long-term prognosis, quality of life and survival time in cats with lower urinary tract disease of cats that underwent perineal urethrostomy. During the years 1400 to 1401, at different time intervals, 7 cases



of DSH male cats with ages 9, 7, 12, 6, 5, 8 and 4 years and 6 cases of Persian male cats with ages 6, 5, 8, 7, 9 and 4 years due to straining during urination and sitting in the soil for a long time and inability to urinate and untimely urination and making noise when urinating and blood in the urine and returning to this condition after previous treatments. They were referred to private clinics and in the records of these cats, there was FIC disease and recurrence of the disease. After clinical examination, urine test and sonography, the decision was made to have urethroscopy surgery. After restraint and anesthesia, the patient prepared the perineal area to the base of the tail for aseptic surgery and the patient was resting on his back while lying on his back. An incision was made in the skin between the anus and the scrotum on the urethra. Subcutaneous sutures with synthetic absorbable sutures and skin with synthetic non-absorbable sutures were sutured as usual. Eleven of these 13 patients survived more than 6 months after surgery, while two died within less than 6 months. 8 of these 11 patients survived for more than 1 year, while 3 others died in less than 10 months, one of whom died of lower urinary tract disease and the other 1 died of old age. Other cats and cats died of other diseases. There was no recurrence of the disease and in two patients (18%) there was a mild recurrence of the disease which was cured by routine treatment and in one cat FLUTD recurred with severe symptoms, ie only 9% of cases recurred. In this study, cats became asymptomatic after surgery or experienced a mild recurrence of the disease, which can be medically managed, and most owners considered their cat's quality of life to be satisfactory after surgery. The results of this study show that the long-term quality of life after perineal urethroscopy in cats with obstructive urinary tract disease in cats is good and the recurrence rate is low.

Keywords: Surgery, Urethroscopy, Lower urinary tract disease, Feline idiopathic cystitis, Perineal

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## **A case report of non surgical management of prostatic hyperplasia and traumatic diaphragmatic hernia with displaced colon into the thoracic cavity in an 8 year old dog.**

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A male 8 years old dog with prostatic enlargement signs admitted to the clinic and an old diaphragmatic hernia was diagnosed along with cystic prostatic hyperplasia in ultrasound imaging. In barium contrast radiography, the colon and small intestinal loops were displaced into the thoracic cavity. The history of the dog revealed that the dog was adopted one year ago with a wound on right lumbar area and a broken tooth that the wound and tooth were treated in a veterinary hospital but the diaphragmatic hernia was undiagnosed at that time. Because the dog had pancreatitis and with respect to risks and benefits of surgery, we decided the non surgical treatment of prostatic hyperplasia with (0.2 mg/kgBW) finasteride and pancreatitis was treated with antibiotics and low fat low protein diet. The dog is in a good condition with reduced prostatic size and controlled pancreatitis 6 months after treatment with finasteride and the dose was reduced to 0.1 mg/kg. Castration is the treatment of choice in male dogs. For males intended for breeding and/or showing, medical therapy with finasteride is effective with no negative effect on semen quality. However, prostatic hypertrophy returns if finasteride administration is discontinued. Our decision for non surgical management in the present case with regard to the





chronic diaphragmatic hernia and the risk of surgical reduction due to possible adhesions and with respect to the good condition of the dog, seems to increase the life expectancy of the patient.

**Key words:** diaphragmatic hernia, prostatic hyperplasia, non-surgical treatment

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## **Effects Of Enteral Pretreatment With Zinc Sulfate On Colonic Anastomosis Repair In Rats**

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One of the most important post-surgical complications in the colorectal surgeries is the anastomotic leakages. Under experimental conditions, the breaking strength of colon anastomosis diminishes postoperatively reaching a minimum day 3. Zinc is a key mineral in different organs that enhances the enzymatic activities. In addition, Zinc deficiency significantly increases the matrix metalloproteinases (MMPs) activi-



ty, which leads to a decrease in the ratio of collagen I to collagen III, delayed cell proliferation, and ultimately the quality of healing of intestinal ulcer. We have investigated the effect of daily enteral Zinc on the healing process of left colon anastomosis in rats. Twenty male mature Wistar rats (median 255 g) were randomly divided into 2 groups (n=10 rats in each group). The control group received 2 mL of saline (PO) and the treatment group received Zinc sulfate (30 mg/kg, orally) starting from 7 days before the anastomosis were made. Using mid-line approach, descending colon was identified and colon was cut and anastomosed by several simple interrupted sutures. On postoperative days 3, the animals were euthanized and the bursting pressure of the anastomosis, the leakage and adhesion score and the amount of collagen deposition were determined. Necropsy findings illustrated that the leakage and adhesion score in treatment group was significantly lower than the control group ( $p<0.05$ ). The bursting pressure results, revealed a significant ( $p<0.01$ ) enhancement in the treatment group animals versus control group. Masson's trichrome staining exhibited that the collagen deposition were significantly higher in both the submucosal ( $p<0.01$ ) and muscular ( $p<0.01$ ) layers of the anastomosis colon in the treatment group comparing to the control group. It can be concluded that the pretreatment with enteral Zinc could enhance the anastomosis strength and wound healing process by increasing the bursting pressure and histopathological indices.

Keywords: Colon, Anastomosis, Zinc, Wound strength

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## **Therapeutic Effect Of Zinc Supplementation On Histological Features And Stability Of Experimental Colonic Anastomosis In Rat**

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Anastomotic leakage is a major and unresolved surgical complication following colorectal resections. To prevent colonic anastomotic dehiscence, pharmaceutical interventions should inhibit degradation of existing submucosal collagen fibers and accelerate the synthesis of new collagen molecules. Zinc has multiple functions in collagen metabolism and was recently found beneficial in colonic anastomosis repair. In addition, Zinc deficiency significantly increases the matrix metalloproteinases (MMPs) activity, which leads to a decrease in the ratio of collagen I to collagen III, delayed cell proliferation, and ultimately the quality of healing of intestinal ulcer. Thus, the present study was conducted to investigate the effects of enteral zinc on the biomechanical and histological properties of colon anastomosis on postoperative days 3 and 7 in a rat model. Twenty male mature Wistar rats (median 240 g) were randomly divided into four groups (n=5 rats in each group). Through midline approach, descending colon was identified, cut and anastomosed by ten simple interrupted sutures. In continue, the control groups received 2 mL of saline, while the treatment group's animals received zinc sulfate (30 mg/kg, PO) for 3 and 7 consecutive days. After 3 and 7 days post-surgery, the animals were euthanized and samples were collected. The bursting pressure and the biomechanical examination were investigated. Amount of Inflammation and collagen deposition were histologically evaluated. The leakage and adhesion scores in



both treatment groups were significantly lower than the control groups ( $p < 0.05$ ). The bursting pressure and the biomechanical properties (maximum load, yield load, stress and absorbed energy) was significantly high ( $p < 0.01$ ) in the treatment group, only on the days 7 post operatively as compared to control group. These comparisons were not meaningful for days 3 assessments. Collagen deposition were significantly high in submucosal ( $p < 0.05$ ) and muscular ( $p < 0.01$ ) layers of colon as comparing the treatment group with control group on postoperative days 7. Compared with control group Lymphocyte, neutrophil and vessels scores of zinc treated rats were significantly low ( $p < 0.05$ ) in days 7 postoperatively. The enhancement of fibroblast ( $p < 0.01$ ) and macrophage ( $p < 0.05$ ) scores was noticeable in the 7 days zinc treated animals compared to control group. It can be concluded that the postoperative zinc supplementation could improve the anastomosis strength and wound healing process by increasing the biomechanical and histopathological indices, especially on postoperative days 7.

Keywords: Zinc, Colon, Anastomosis, wound healing

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## **Successful Surgical Management Of 3 Cases Of Perineal Hernia In Small Breed Dogs By Simultaneous Use Of Three Surgical Techniques**

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Perineal hernia is a common disease in healthy male dogs and can be unilateral or bilateral that can also be caused by weak pelvic floor muscles. Several surgical techniques have been described to treat it. The most commonly used method is internal obturator muscle displacement, which is often successful. However, additional techniques, including gluteal muscle displacement, semitendinosus muscle displacement, synthetic implants, and biomaterials, may be required to enhance internal obturator muscle displacement. In this clinical report, 3 small breeds of dogs under 10 kg were referred to a private clinic with evidence of unilateral mass on the right side of the anus and inability to urinate. In one of these three cases, the connection of the bladder wall to the skin and the passage of urine through a new path were found over time, for which the definition "fistula" is appropriate. There were two cases of hernia between the levator ani muscle and the anal sphincter and one case between the levator ani muscle and the coccygeal muscle. Preliminary blood tests in all three cases revealed evidences of urinary retention such as elevated urea and potassium, and in one case early evidence of acute renal failure such as increased phosphorus and creatinine. Following the path of completing the para clinic assay, ultrasound was used to confirm three cases of simultaneous bladder hernia and one case of simultaneous bladder fistula to the skin of the perineal area. In previous studies, three common methods of suturing the muscles next to the hernia, using the internal obturator muscle flap or using the mesh have been mentioned as three common methods. These three cases showed the simultaneous use of the three mentioned techniques have minimal postoperative problems and controlled recovery up to 2 years after surgery. Swelling and accumulation of serum fluid within a week after surgery were found in two of the three cases. There have been no reports of hernia recurrence or mesh loosening. All animals were sterilized simultaneously to help reduce prostate volume at the site of hernia and restore muscle strength in the absence of sex hormones.

Key words: Perineal hernia, Dog, Internal obturator muscle

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## **Histopathologic Classification Of Surgically Excised Canine Cutaneous Perivascular Wall Tumors: Report On 7 Cases**

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The cellular component of the vascular wall may undergo neoplastic transformation. Hemangioma and hemangiosarcoma are the benign and malignant neoplasms of the endothelial layer, respectively. Neoplastic condition of the other cells within the vessel wall is generally known as “Perivascular wall tumors (PWTs)”. The entity, previously known as hemangiopericytoma, is most appreciated in the skin and is commonly diagnosed in aged large breed dogs. Perivascular wall tumors are subclassified in terms of their histological, immunohistochemical, and ultrastructural characteristics. Hence, hemangiopericytomas, myopericytomas, angioleiomyomas, angiofibromas, and angiofibromas are all described in PWTs. Here we present seven cases of canine perivascular wall tumors in 4 female and 3 male dogs of Poodle, German Shepherd, and Terrier breeds, from 7 to 14 years of age. The specimens were received in various sizes and consistencies, being soft and fatty or rubbery and fleshy. The neoplastic masses were all endophytic. Upon histopathology, dermal to subcutaneous angio-centric whorls of spindle cells were noted. In the studied cases, the neoplasm was almost inevitably represented in the forelimb, where the



elbow region and antebrachium were exclusively involved. This is in line with previous reports where this neoplasm was most commonly reported in the limbs. Interestingly, one tumor was noted bilaterally involving the elbow region and regrew four months after the initial excisional procedure, where neoplastic cells were histopathologically seen within the surgical margins, and re-excision was recommended. Mitotic activity and pleomorphism were more prominent in the recurrent mass compared to the first resected tissue. SOX10 immunostaining was utilized to rule out Peripheral Nerve Sheet Tumor (PNST) and none of the cases were stained positive. The patients were carefully followed up for 1 year for early detection of tumor recurrence, and no regrowth was noted, except for the aforementioned mass. Wide resection margins are preferred in this neoplasm; otherwise, recurrence is expectable. Complete excision and radiotherapy have been reported to be successful.

**Keywords:** Dog, Perivascular wall tumor, Skin, Surgery, Surgical pathology

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## **Iatrogenic Sciatic Nerve Injury Due To Im Injection: Tree Case Reports**

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Intramuscular (IM) injections are common routes of drug administration. IM injections can result in complications such as damage to the sciatic nerve. Due to the critical role of this nerve in locomotion and weight-bearing limbs, a poor prognosis for recovery may be observed in many cases. First case is a 4-year-old intact female pet rabbit (*Oryctolagus cuniculus*) admitted with a history of intramuscular injection (Enrofloxacin) and inability to weight support on the left hindlimb. Ultrasonography identified a hyperechoic area around the left sciatic nerve. Neurological examination revealed negative DPS, proprioception, and normal to exaggerated patellar and sciatic reflex. The case went back to normal weight-bearing after 3 months by following treatments. Second case is a middle-aged mature intact male dog (Yorkshire Terrier) presented with a history of intramuscular injection (Phenylbutazone) eleven days ago. Neurological examination confirmed negative DPS, CCLR, MPL, and positive Ortolani's sign in the left hindlimb. Ultrasonography showed a hypoechoic area in muscles around the left sciatic nerve. Treatments did not affect, possibly due to delay in initiating effective treatments. Third case is a 6-year-old neutered female pet rabbit (*Oryctolagus cuniculus*) admitted with a history of caudal mammary gland mass removal followed by intramuscular injection (Enrofloxacin) in the right hindlimb. Neurological examination revealed negative proprioception and positive deep pain. Ultrasonography identified a hypoechoic area around the right sciatic nerve. Daily practice and physiotherapy along with NSAIDs and Neurobion admission resulted in recovery after two weeks. Since the caudal thigh musculature is a common site for intramuscular injections in dogs and rabbits, sciatic nerve damage can result directly from needle injury, the agent used, the drug's chemical site reaction, or later by scarring involving the nerve. The most critical factor in recovering is early aggressive treatment as soon as possible.

Keywords: Iatrogenic injury, sciatic nerve, intramuscular injection

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## **Surgery And Histopathology Of A Rare Case Of Angioleiomyosarcoma In The Peri-Vulvar Area In A Terrier Dog- The First Report**

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Perivascular wall tumor (PWT) originates from cells comprising vessel walls, except for the endothelial lining. Some researchers categorize PWTs in soft tissue sarcomas (STSs). Perivascular wall tumors include a spectrum of neoplasms such as angioleiomyoma and angioleiomyosarcoma (originating from smooth muscles of the vascular wall), angiofibroma (originating from cells of the vascular adventitia), and angiofibroblastoma. Angioleiomyosarcoma is a rare malignant



tumor of the smooth muscle that originates from the muscular layer of the vessel wall. To our knowledge, angioleiomyosarcoma has not been previously reported in the peri-vulvar area in dogs, and this is the first report of this malignant neoplasm in this region in a dog. In May 1401, a 12-year-old spayed Terrier was referred to Petsar veterinary clinic, presenting a large subcutaneous mass, gradually increasing in size, growing in the peri-vulvar region. A firm, subcutaneous, immobile, and painless mass was palpable upon clinical examination. Hematologic examination, including complete blood count (CBC) and evaluation of the biochemical factors was undertaken, revealing that the patient suffered from normochromic normocytic anemia (chronic disease anemia (ACD)), while the biochemical profiles were within normal limits. Upon ultrasonography, an encapsulated echogenic mass was observed in the left aspect of the vulva, measuring 4.5\*1.5 cm, possessing central blood supply. No metastases were seen on thoracic and abdominal radiographs. Radical surgery was undertaken to prevent recurrence of the probable neoplasm, removing the tumor with lateral margins of at least 3 cm. Before closing the surgical site, tissue samples were obtained from the neoplastic mass and resection margins to ensure complete removal. Tissues were then immersed in 10% neutral buffered formalin and submitted for pathology. Histopathologically, dense aggregates of malignant spindle cells were noted mimicking smooth muscle fibers, possessing remarkable pleomorphism, invasion, and mitotic activity (MC= 12 / 10 HPF), arranged in interwoven bundles and whorls, specifically, perivascular whorls. Angioleiomyosarcoma was diagnosed and confirmed based on histopathological, histochemical (Masson's Trichrome), and immunohistochemical ( $\alpha$ -SMA) examinations. Interestingly, these marked malignant features were seen in a primary non-recurrent neoplasm. It can be concluded that any tumoral growth must necessarily be examined clinically and histopathologically due to the divergence of underlying causes of such lesions.

Keywords: Surgery, surgical pathology, Angioleiomyosarcoma, vulva, Dog

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## Report Of Pneumopericardium In A Native Iranian Dog

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The accumulation of air or gas inside the pericardium is called the pneumopericardium, which usually indicates an abnormal communication between the pericardial sac and the adjacent air-containing structure. Pneumopericardium is pathogenically divided into two types: spontaneous and traumatic. Spontaneous pneumopericardium in infants is associated with lung diseases such as hypoplasia and respiratory distress syndrome, and spontaneous pneumopericardium can be caused by the direct spread of inflammatory, infectious, or neoplastic processes in the lungs. Traumatic pneumopericardium occurs by pleural-pericardial communication associated with chest trauma and iatrogenic chest injury. In humans, the main causes of pneumopericardium are alveolar rupture, baro-traumas, and blunt chest trauma; cardiac surgery and esophageal or gastric perforation are also frequent causes. The mechanism of pneumopericardium is the direct connection between the pericardium and the airways. Pneumopericardium is uncommon in small



animals and only a few reports have been reported. In some cases, pneumopericardium can lead to a life-threatening complication called cardiac tamponade in which extra air builds up around your heart. The air puts pressure on your heart and stops it from working properly. In May 1401, a native dog was referred to a veterinary clinic due to an accident with difficulty breathing. On physical examination, the animal was diagnosed with hypothermia, tachypnea, tachycardia, and pale mucous membranes, and severe pain on palpation of the abdomen. In the thoracic and abdominal graphs, a 16 mm metal foreign body was observed in the ventral part of the thoracic cavity and pneumopericardium was diagnosed. A pelvic graph showed multiple fractures of the sacrum, a dislocation of both sacroiliac joints, an old, malignant fracture in the left wing of the pelvis, and multiple fractures in both anterior branches of the pubic bone. Ultrasound showed general steatitis and free fluid (hemoabdomen / uroabdomen) and the case was suspected of rupturing the bladder. Unfortunately, the patient died during the treatment and diagnostic procedures due to the deterioration of the general condition and the delay in visiting the clinic.

It is noteworthy that this patient survived for several months despite pneumopericardium and eventually died from a pelvic fracture that led to the rupture of the bladder and urethra and the effects of this lesion.

Keywords: Pneumopericardium, foreign body, dog, trauma

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## **Case Report Of Bilateral Mandibular And Sublingual Salivary Gland Sialadenectomy In A 3-Year-Old Mixed Breed Male Dog**

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Sialoceles, also termed salivary mucoceles, are collections of saliva within subcutaneous tissue. Resultant saliva-filled cavities are lined by inflammatory connective tissue and are not true cysts. The most common source of saliva is leakage from the sublingual salivary gland or duct; however, origination from any gland is possible. Sialoceles have reportedly been caused by trauma (nonsurgical and surgical), sialoliths, foreign bodies, and neoplasia. The location of the sialocele often determines the presenting complaint and points to the offending gland. Bilateral surgery is recommended when it is not possible to diagnose the affected glands. The ventral approach for mandibular and sublingual sialadenectomy is preferred to reduce the recurrence of sialocele. A 3-year-old male dog with a history of sialocele and a previous surgery was referred to the small animal hospital of the University of Tehran from another center. There was a large fluid-filled non-painful mass on the ventral side of the neck of the patient. Fine needle aspiration was performed. The sample was sent to the laboratory and the sialocele has been confirmed. Examination could not differentiate the affected side. CT scan was performed to indicate the side which gland were removed in previous surgery and to reveal the affected side. On CT scan examination, the source of free fluid was not detected, therefore Bilateral mandibular and sublingual sialoadenectomy has been scheduled. Bilateral sublingual and mandibular sialadenectomy was performed through a ventral approach. Postoperative care for two weeks and



Post-surgical pressure bandage for 5 days were performed. After two weeks of surgery, the wound healed completely and there was no sign of recurrence. The patient was rechecked after one and half years and there was no sign of recurrence or any other abnormality in the region.

key words: Sialocele, Sialadenectomy, Dog, Salivary glands, Iran

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## **Myxoma: A Case Report of Excision of A Huge Myxoma in A 15-years-old Dog**

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subcutaneous myxoma is a rare myxoid tumour of the skin and subcutaneous tissue in domestic animals. and considered to be a benign neoplasm that normally stem from subcutaneous or dermal fibroblast. A fifteen-year-old 12kg sterilized female terrier dog with a huge mass locating in thoracolumbar region was referred to a private veterinary center. Clinical examination revealed subcutaneous mass at the tho-



racolumbar region. the owner mentioned tumor was seen for the first time 2 years ago by a small mass which was still growing and getting larger. clinical examination also indicated myxoma mitral valve degeneration. Blood cell count test and biochemistry test confirmed obtained information. Plain and contrast computed tomography from thoracic and lumbar region was done in order to examine the mass (due to case's condition it was done without anesthesia). it revealed a mass with the size of 13.8×22.9×32.8 cm located in dorsal aspect of caudal thoracic and lumbar part, inclined to left. It also had mineralization foci in caudodorsal aspect, from T11 to caudal vertebrae. Distruption of left wall of thoracic and lumbar part was presented which was cause of discussed mass. Fine needle aspiration sample revealed the presence of benign mesenchymal tumor called myxoma. As a result, the patient underwent surgery for tumor removal and standard marginal resection was performed for procedure. Histopathology examination of resected mass confirmed the diagnosis of myxoma. The mass weighted after resection and readed 5 kg. therefore weight of the dog decreased to 7kg after resection of the tumor. injectable triamcinolone for prevention of inflammation. Post-operative medication included tramadol, gabapentin and cefazolin. Post-operatio check-up revealed that the patient is doing better and the tumor stop growing. Clinical relevance shows that Myxoma is a rare tumor in domestic animals especially dogs and surgical treatment is the best choice.

Keywords: myxoma, invasive tumor, tumor removal

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## **Surgical Treatment Of Egg Binding And Peritonitis In A Green Iguana**

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Dystocia is a common obstacle in green iguanas that frequently occur because of inadequate nesting site. One of the dystocia complications is egg binding. This article reports a female iguana, with symptoms included lethargy, decreased activity, and anorexia who was referred to a private veterinary clinic to check the condition. The chief complaint was not laying eggs during a year in an iguana who had regular laying before. On clinical examination, swelling of this area was confirmed and radiographs were obtained. The radiographs showed calcified oval masses in the caudal aspect of the celomic cavity, which indicated the presence of eggs also, a large amount of free fluid was seen which indicated peritonitis. Based on clinical, and diagnostic imaging findings, animal mating time and duration of symptoms, cystic calculi, tumors, and abscesses were ruled out, and peritonitis with egg binding was confirmed. For the treatment of this disease, the surgery was preferred to the methods of hormonal stimulation, physical manipulation, and percutaneous oocentesis. Surgical treatment is applied when other non-invasive methods are not effective for hardening and there is evidence that the eggs can't be removed. Ovariosalpingectomy began with a paramedian incision of a celium, and after the oviduct and ovaries were exposed, removal of them and eggs was done. After surgery the patient was followed up for 2 years and no abnormalities were detected.

Keywords: iguana, egg binding, ovariosalpingectomy

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## Case Report Of Removal Of Ovarian Dermoid Cyst In 1.5 Years Old Dsh Female Cat

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Germ cell tumors are uncommon neoplasms arising from primordial germ cells, which migrate to the ovary from the yolk sac. These tumors include dysgerminomas and teratomas, the latter of which contain abnormal tissue from all three embryonal cell lines. Being that cell can give rise to all orders of cells necessary to form mature tissues and often recognizable structures such as hair, bone, sebaceous (oily) material, neural tissue, and teeth. They are unusual in any domestic species, particularly in cats. Histologically, benign and malignant forms are distinguishable. In most instances of ovarian or uterine disease, surgical removal of the diseased organ by ovariectomy or ovariohysterectomy is the recommended treatment. A 1.5 years old DSH female cat with a history of abortion and symptoms of lethargy, anorexia, and fever was referred to the small animal hospital of the University of Tehran. Pyometra was one of the primary diagnoses. The patient was referred to Radiology for Ultrasonographic examination. There was a high blood supply and heterogeneous mass-like lesion near to proximal part of the uterine horn adjacent to the left ovary in the ultrasonographic examination. Ovariohysterectomy was scheduled. The incision was made through a cranial abdominal approach. The incision was increased due to better exposure for removing the neoplastic ovary. The uterine horn was elevated by using a hook. Suspensory ligament was stretched and the ovarian pedicle was ligated by figure-eight and circumferential patterns. Broad ligament was transected. The above steps were performed on the ovary of the opposite side. The uterus was ligated in front of the cervix with trans fix and circumferential patterns and removal. Abdominal wall was closed in three layers. The left ovary had a polycystic appearance and dimensions of 5 by 5 cm. After surgery, the ovary with



mass was completely sent for histopathological examination. After histopathologic evaluations, dermoid has been confirmed. There was no post-surgical complication. The patient was checked after 2 weeks, for suture removal and the general condition was normal after 2 months.

key words: Cat, Teratoma, Dermoid, Ovariohysterectomy, Iran

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## **Using Key Ring Fixator In An 8-Month-Old Cockatiel And A 4-Year-Old Green-Cheeked Parakeet With Tibial Fracture**

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Orthopedic conditions are one of the emergencies in avian medicine that veterinarians encounter frequently. Because of anatomic limitations and complications like joint ankylosis, managing fractures in avian is a significant challenge for veterinary surgeons. Because of these limitations and complications, external skeletal fixators (like Ilizarov technique) have attracted a lot of attention. Since endosteal blood supply and callus formation are crucial for bone healing, providing bone alignment and reduction with minimal vascular compromise is one of the main benefits of external skeletal fixations methods. As the complications related to the fixators are few, and the percentage of successful outcome is high using external skeletal fixators (ESF) are a promising technique for treating avian orthopedic conditions. In this report we describe a modified Ilizarov technique using 2 key rings as frames, 4 IV catheter stylets as fixation pins, and needles as rods to connects



the rings and fast glue. An 8-month-old male Cockatiel and a 4-year-old male Green Cheeked parakeet with non-weight bearing lameness in left leg and right leg respectively, were referred to the Veterinary Teaching Hospital of Ferdowsi University of Mashhad. Physical examination showed depression and anorexia. Based on physical examination and radiologic evaluation of both birds, mid-shaft tibiotarsal fracture with a craniolateral displacement of the distal fragment was confirmed. After informing the owners, the animals were prepared for surgery. The surgeries were performed under general anesthesia. After closed bones reduction, external fixations were performed. Two stylets were inserted in the proximal part and two stylets were inserted in the distal part of the fracture, passing through the bone and the key rings. Furthermore, the key rings were connected together using needles and fast glue to provide the necessary support. The two-ring external fixator apparatus allowed for post-operative weight-bearing with minimal care and maintaining bone length during healing period. Post-operative care included Calcium additives, Antibiotics (Enrofloxacin) and analgesia (Meloxicam). The ESF was removed after two months and the birds could bear weight on the affected limbs.

**Key words:** Bird, external skeletal fixator, fracture, Ilizarov technique, tibiotars

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## **Renal Cell Carcinoma In A 4-Year-Old Rabbit- A Case Report**

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Urogenital neoplasms are unusual in rabbits, and most reports are focused on kidney tumors. Embryonal nephromas are usually found in pet rabbits and are accidentally found during necropsy. Embryonal nephromas are typically benign in rabbits and have been described in all ages, with the tumors generally becoming more prominent with age. Renal cell carcinoma (RCC) has been rarely reported. The tumor is usually massive with a smooth surface and is generally found in the renal cortex. The most common signs of renal carcinoma are weight loss, hematuria, anorexia, anemia, etc. On regular physical examination of the abdominal cavity, a mass is usually palpated. Here we describe renal cell carcinoma in a 4-year-old intact female pet rabbit (*Oryctolagus cuniculus*) presented with hematuria with a palpable mass on the right side of the abdomen. Complete blood count (CBC) and serum chemistry showed polycythemia and a high level of serum creatinine. Fine needle aspiration was done, and it revealed a cluster of epithelial and pleomorphic cells. Radiography and ultrasonography showed a unilateral renal mass suspected to neoplasia. Nephrectomy was undertaken, and the excised kidney was submitted for histopathology. Upon histopathology, large pleomorphic neoplastic cells were observed arranged in papillae with marked mitotic activity ( $>10/10$  HPF). Hence, renal cell carcinoma-Grade II was diagnosed. Macroscopically, the tumor was very large and numerous arterial communications existed between the mass and caudal abdominal aorta. Urinary tract disorders, such as urolithiasis and hypercalciuria, frequently occur in rabbits. Renal cell tumors are rarely reported in rabbits and have never been reported in



guinea pigs. Diagnosis is usually made on abdominal palpation, radiographic or ultrasound exam, and biopsy of affected renal tissue using different methods such as FNA. Unilateral nephrectomy is curative and makes precise definitive histopathologic diagnosis possible

**Keywords:** Renal Cell Carcinoma, Nephrectomy, Surgical pathology, Kidney, Rabbit

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## **Mantle Cell Lymphoma And Testicular Seminoma In A Dog - A Case Report**

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Various splenic diseases can result in a splenic mass and necessitate splenectomy. Lymphoma is a type of solid tumor that may appear diffuse or follicular. It mostly occurs in middle age and old animals. It is a kind of genetic-based disease in dogs and, as the most prevalent hematopoietic neoplasm, often happens in some specific breeds like Boxers and Golden retrievers. Mantle cell lymphoma (MCL) is a type of non-Hodgkin's lymphoma that affects the lymphatic system. This pa-



per reports a ten-year-old intact male Terrier dog presented to the small animal hospital, Faculty of Veterinary Medicine, University of Tehran. The owner's chief complaint was the enlargement of one of the testicles and infrequent vomiting. Testicular mass was evaluated in clinical examination. In the following step, the patient was assessed by ultrasonography to explore the abdominal cavity for any probable metastases and the testicular region to study the quiddity of the mass. According to the results, a mass-like lesion in the large testicle and a splenic mass were noted. A computerized tomography scan was done in order to figure out the margins and the exact size of the tumors. Based on the outcomes, a left side testicular mass of about 5×3×3 cm, prostatomegaly and intra prostatic cyst, and a cavitary mass in the splenic tail were diagnosed. Fine needle aspiration indicated lymphoma and splenectomy was the choice treatment. Hence, the dog was placed in dorsal recumbency and underwent surgery via the ventral midline abdominal incision which extends from the xiphoid to the umbilicus. Total splenectomy and castration were done. Samples were sent to the laboratory. Splenic mantle cell lymphoma (MCL), metastatic diffuse highly malignant seminoma, and diffuse atrophy of the smaller testicle that spared sertoli cells, were diagnosed by histopathology and immunohistochemistry tests. Based on the follow-up after surgery, splenectomy and castration which has been done, were effective and the dog had not any other problems in all rechecks after two, fourteen, and seventy-five days after surgery. Also, online follow-up conservations were made after four and six months postoperatively and the owner mentioned no significant problem in the general health of the patient.

**Keywords:** Splenectomy, Lymphoma, Seminoma, Diagnostic imaging, Dog

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## Hepatic Carcinoid (Neuroendocrine Cell Tumor) In A Terrier Expressed Synaptophysin- A Case Report

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Expression of synaptophysin, chromogranin A, and/or Insulinoma-associated protein 1 (INSM1) is common in the neuroendocrine neoplasm of the liver. Using immunohistochemistry, synaptophysin can be demonstrated in a range of neural and neuroendocrine tissues, including cells of the adrenal medulla and pancreatic islets. As a specific marker for these tissues, synaptophysin, can be used to identify tumors such as neuroblastoma, retinoblastoma, pheochromocytoma, carcinoid, small-cell carcinoma, medulloblastoma, and medullary thyroid carcinoma, arising from mentioned tissues. Diagnostically, it is often used in combination with chromogranin A. A nine-year-old female Terrier dog, with a history of hypoglycemia (Glucose= 28 mg/dl), lethargy, and weakness was referred to the Small Animal Hospital of the Faculty of Veterinary Medicine, University of Tehran. In addition to reviewing this history, the preoperative biochemical profile showed an increase level of liver-related enzymes such as alkaline phosphatase and alanine aminotransferase. The biopsy of two hepatic lobes and a mass obtained from adjacent to the pancreas, was performed and sent for histopathological examination. At the first step, H&E staining was



done and for diagnostic confirmation, synaptophysin immunostaining was chosen. Following the staining, neuroendocrine diffuse tumor with a solid growth pattern was observed. Multiple variably-sized islands, rosettes, ribbons or solid areas divided by fine fibrovascular stroma and characteristic invasive behavior in the liver and pancreas were noted. Connective tissue component was little and unremarkable mitotic activity and marked pleomorphism were observed. Furthermore, diffuse hepatocellular vacuolar and vesicular degeneration, thrombosis, and hemorrhage were found. Histopathological findings were most consistent with neuroendocrine neoplasm of the liver using synaptophysin marker. This kind of tumor has various histopathological types which can be diagnosed and confirmed by synaptophysin, chromogranin A and INSM1. In this case, the synaptophysin marker has been used and this distinguishing marker could approve the diagnosis of the tumor. In cases of concurrent pancreatic masses and hypoglycaemia, early biopsy of the suspected mass is recommended to achieve the definitive diagnosis. Thus, insulinoma-associated hypoglycaemia can be differentiated from paraneoplastic hypoglycaemia stemming from other neoplastic conditions.

**Keywords:** Dog, Liver, Neuroendocrine tumor, Synaptophysin, Surgical pathology.

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## **Hemangiosarcoma: A Case Report Of Excision Of A Massive Hemangiosarcoma In Left Kidney Of A Poodle-Dog**

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Hemangiosarcoma is cancer of the vascular endothelium, or the blood vessel walls. It accounts for 0.2 to 3 percent of all canine tumors with a mean age at diagnosis of 9 to 12 years. A 10-years-old 10.5kg sterilized female poodle dog presented to a private veterinary center with history of abdominal region pain, hematuria, lethargy and anorexia for the past three months. The physical examination showed high blood pressure and high body temperature and the obtained history was approved. The case was referred to laboratory and diagnostic imaging department for more information. Laboratory results indicated leukocytosis, hyperchromia, thrombocytosis and 43.1% hematocrit. In ultrasonography evaluation a massive mass with cavitation and mixed echogenicity was observed with prominent vasculature that distorted inner architecture and external contour of left kidney also scant of hypoechoic free fluid was seen adjacent of the organ whereas there was no evidence of change in parenchyma of right kidney. In addition the results showed some signs of metastasis in lungs. After investigation results, surgery was performed under inhalation anesthesia. With the exploration of abdominal cavity and left flank region, the left kidney was completely surrounded with the mass and an abnormal adhesion between jejunum and kidney's capsule was observed. The surgery was performed with the method of tumor removal, nephrectomy, intestinal resection and anastomosis. The results of post-operation cytology and pathology approved existence of hemangiosarcoma in the removed kidney.

Post-operation treatment included electrolyte and fluid therapy, tramadol, enrofloxacin and ampicillin. About one month after surgery, patient



was improving and general condition was getting better therefore the case was referred to spaciaist doctor for chemotherapy. Hemangiosarcoma most commonly affects the spleen, liver, right atrium of the heart and skin, however, this kind of hemangiosarcoma happens very rarely.

Keyword: hemangiosarcoma, nephrectomy, kidney

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### **Radiological Evaluation And Surgery Of Right Hepatic Lobe Torsion In A Three-Year-Old Loop Rabbit**

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Liver lobe torsion is a rare condition that takes place with unknown origin. It occurs in many species such as Horses, Dogs, Pigs, Otters, Rats, Syrian mice and Rabbits. The rabbit liver consists of four main lobes which are separated into left and right regions by a deep cleft. There



are also two accessory lobes, the first one is the quadrate lobe which is behind the gallbladder and the second one is a small circular lobe called the caudate lobe that is placed next to the right kidney. This lobe has narrow attachment with the hilus, which makes the caudate lobe prone to displacement and torsion. Rabbits who suffer from hepatic torsion are reported to be within 1.59 - years old. No sex predilection has been noted in the prevalence of hepatic torsion in rabbits. Usual clinical signs would be anorexia, lethargy, constipation, jaundice and abdominal pain. The condition could be an incidental finding that will be diagnosed after necropsy. Surgery and/or supportive treatment are the treatment choices based on the extension of the lesion diagnosed by ultrasonography. A three-year-old male loop rabbit was referred to the small animal hospital of Faculty of the Veterinary Medicine, University of Tehran, Iran with a history of lethargy, anorexia, abdominal pain and dilation of the abdomen. In conventional radiography gastric dilation with heterogeneous food material and large amount of gas content in cecum has been detected representing GIT hypomotility. Ultrasonographic findings indicated some amount of peritoneal free fluid, hypoechoic parenchyma of right hepatic lobe with unsharp borders and no sign of blood flow in color Doppler that confirmed right hepatic lobe torsion. Urgent surgery by right hepatic lobectomy was recommended. By median approach peritoneal cavity has been exposed and blood vessels of the right liver lobe were ligated by silk suture material number 3-0. Total lobectomy was done and the abdominal cavity was closed as routine route. Antibiotic and analgesic therapy continued for seven days after surgery. In periodic check-up one month after surgery normal appetite and progressive improvement of the patient was detected.

Keywords: Rabbit, Liver torsion, Lobectomy, Radiology, Sonography

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## **A Rare Occurrence of a Primary Pulmonary Cyst Adenocarcinoma in a Shih Tzu- Terrier Dog**

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According to the human literature, cystic adenocarcinoma is a specific epithelial malignancy most commonly encountered in the salivary glands. The upper respiratory tract is considered an uncommon site, and involvement of the pulmonary parenchyma, especially as a primary neoplasm, is rarely seen. Moreover, there is no similar report in the veterinary literature. A 5-year-old bitch was referred to the Small Animal Hospital of the Faculty of Veterinary Medicine, University of Tehran, with 6-months history of respiratory disease symptoms including dyspnea, wheezing, abdominal breathing, and other signs like lethargy, anorexia, and weight loss. Previously, a pulmonary mass was mentioned in radiographic images of the thorax. A cyst mass-like lesion, measuring 81.75\*63.45\*141 mm (height-width-length respectively), in the left side of the thorax, was diagnosed by sonography and computed tomography with intravenous administration of iodinated contrast medium (850 mg of I/kg VISOPAQUE). The mass was extended from the cranial aspect of T2 to the caudal aspect of T13 with attachment to the visceral and parietal pleura. With the goal of mass removal and improvement of the respiratory condition, partial lobectomy with a sternotomy incision was performed. A large cyst-like mass was noted with attachment to the left cranial and caudal lobes of the lung. In order to



transect the mass completely with a margin as safe as possible, partial lobectomy of the mentioned involved lobes was performed. The whole mass was sent to the veterinary pathology laboratory. Pneumothorax and pleural effusion were controlled by thoracostomy tube placement up to 3 days postoperatively. Upon histopathology, a capsular mass was noted composed of malignant pleomorphic mitotically active, and invasive cells, with foci of squamous differentiation. Pathological and immunohistochemical (TTF1, Pankeratin, CK5/6) examinations, revealed a primary pulmonary adenocarcinoma, squamous cell subtype. Re-examination of the dog 6 weeks postoperation due to the owner's complaint of recurrence of respiratory symptoms, confirmed the recurrence of the lesion at the exact prior location with computed tomography (same initial examination protocol). Due to the poor prognosis of chemotherapy, the owner refused to continue the treatment and opposed euthanasia. Eventually, the dog expired 4 months post-surgery. This paper aims to report a rare occurrence of a primary pulmonary cyst adenocarcinoma, due to the type(primary), cystic nature, early age, and lack of similar reports in dogs and examine it from clinical, radiological, pathological, immunohistochemical, and surgical treatment aspects.

keywords: Pulmonary adenocarcinoma – Partial lobectomy - Cystic adenocarcinoma- Lung – Neoplasia, Surgical pathology

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## **Diagnosis & surgical management of a 10-year-old Shih-Tzu Terrier dog with bladder urothelial carcinoma- A case report**

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Urinary bladder neoplasms are uncommon in dogs with reported incidence of 0.5-1.0% of all canine tumors. Urothelial carcinoma, also known as transitional cell carcinoma (TCC) is the most commonly diagnosed urinary bladder (UB) malignancy in dogs typically involves the trigone in average age of 9–11 years. This report is representing a 10-year-old intact male Shih-Tzu Terrier dog referred to the Small Animal Hospital of the Faculty of Veterinary Medicine, University of Tehran with a 1-year periodic history of hematuria, dysuria, stranguria, and somnolence. Clinical examination revealed lethargy, inability to weight bear contrary to normal gait at home. Ultrasound examination demonstrated a localized irregular pedunculated heterogeneous intramural mass with mild blood supply in cranioventral aspect of the bladder wall measuring 2\*1.03cm with no sign of regional lymph nodes involvement. Microliver, hepatopathy and bilateral nephromegally, which was consistent with the results of biochemistry profile indicating the presence of hepatopathy, were noted. Cytology of cells obtained via traumatic catheterization led to differential diagnosis of the TCC. Urine sampling through free-catch catheterization and urinalysis revealed ep-



ithelial cell cast, hematuria and decreased urinary concentration ability. Upon localized nature with no obvious evidence of metastases and more importantly its location, partial cystectomy was performed. An irregular mass in cranioventral aspect of the UB was noted and completely resected with tumor-free margins as much as possible. Daily urine examination was achieved by urine-catheter and urine-bag up to 5days post-operation. In pressure smear of the mass, cohesive sheets of epithelial cells with markedly malignant features were consistent with TCC. As robust diagnosis of urothelial carcinoma histopathological scrutiny of the excisional biopsy revealed a papillary growth of neoplastic cells stemming from urinary bladder mucosa, possessing abundant cytoplasm, multiple cytoplasmic vacuoles (Melamed-Wolinska bodies), prominent nucleoli, mitotic activity (MC= 12/10 HPF), marked pleomorphism, and invasion to the stroma and vessel walls, sparing the muscular layer. Resection margins were not specified, however, areas lacking epithelium and areas covered by normal epithelium were present devoid of neoplastic cells and decisively urothelial carcinoma was confirmed. To achieve the mainstay of treatment procedure the patient was referred to the chemotherapist. Based on follow-up examinations, this paper illustrated that although UCs are difficult to remove surgically due to their common trigone involvement and metastases, treatment of localized cases of TCC without trigon involvement through surgical resection is conceivable.

Keyword: Transitional cell carcinoma, Urothelial carcinoma, Partial cystectomy, Urinary bladder, Surgical pathology

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