LASER DISC DECOMPRESSION IN DOGS

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Topic: 5. Canine and Feline Surgery / Orthopedics

This study presents the results of disc protrusion treatment in dogs with the use of percutaneous laser disc decompression (PLDD).

PLDD was performed at two dogs (mix-breeds and German Speppard) in which pelvic limbs paresis, impaired proprioception, incoordination and exaggerated spinal reflex in pelvic limbs was observed. The patients were anesthetized using medetomidine at 10μg/kg i.v. (Sedator, Novartis) and propofol at 3 mg/kg i.v. (Disoprivan, Zeneca), and positioned in sternal recumbency. A spine coil was used for MR imaging at 0.25 Tesla (Vet Grande, Esaote, Italy). The MRI procedure was performed both in sagittal and transverse planes using FSE REL (TR 3000, TE 120), and X BONE (TR 970, TE 28) sequences. Protrusion of intervertebral disc was observed on Th13-L1 level (Fig. 1) in the first dog. In the second dog above mentioned sequences plus Gradient Echo (GE) were used. Extrusion of intervertebral disc between L6-L7 on sagittal, and transverse plane in was observed (Fig. 2). PLDD was done under C-arm monitoring. The herniated nucleus pulposus was vaporized. In all two cases pain and ataxia subsided on the second day after surgery. The results of clinical and neurological tests were consistent with SSEP readings. PLDD is a minimally invasive surgical technique which delivers effective treatment for disc protrusion. PLDD may offer an alternative to conventional surgery by eliminating the pressure exerted by a herniated disc without disc sequestration.
The purpose of this research was to investigate the effects of intraocular pressure (IOP) in extracapsular cataract extraction (ECCE) and phacoemulsification methods with or without intraocular lenses (I.O.L) on dogs with cataract for a 28-day period. Thus, ultrasonographic applications were used to evaluate the conditions of the lens and fundus of the eye.

Twenty dogs with cataract were randomly divided into two groups. Extracapsular extraction was performed on 10 dogs with mature and hypermature cataracts. Phacoemulsification operation was performed on dogs with immature cataracts. Fortyone dioptics single-piece acrylic intraocular lens was placed in 10 dogs. Intraocular pressures of the animals were measured on the 7th, 14th, 21st and 28th days with digital tonometry in the pre and post-operative period of the operation.

Intraocular pressure was felt at the lowest level 14 days after the operation in the ECCE without I.O.L implanted group. The I.O.L implanted group showed irregular levels. Intraocular pressure level was the lowest on the 21st day, without I.O.L implanted group in phacoemulsification. However, all values remained within the reference values at the end of a 28-day period postoperatively. It was concluded that both surgeries could be used for cataract cases in terms of IOP effects. It was also suggested that selection of patients, correct surgical techniques and adequate equipment were important for eye surgery. Moreover ultrasonographic examination was always very helpful to support postoperative term.
The objective of the study was to compare the Harmonic scalpel (HS) and Enseal device (ED) in laparoscopic ovariectomy (LOE), in terms of the duration of surgery and safety.

Preventive LOE by HS (Group A=14) was compared with LOE by ED (Group B=14). The breed, sex, age, body condition score (BCS), pedicle fat (scores 0-3), and mesovarial bleeding (scores 0-3) of all of the patients were recorded. The overall LOE duration and the time needed to remove the left or right ovary were also measured and recorded. Perioperative complications were monitored and detailed.

No bleeding requiring laparotomic conversion was recorded in any of the subjects. Coagulation of mesovarial vessels by both devices was excellent. The right ovary was removed significantly faster compared with the left one regardless of device (Wilcoxon signed-rank test; p=0.002 and p=0.016). Disregarding the device, a greater amount of periovarian fat was associated with increased surgical times (non-parametric Kruskal-Wallis test; p=0.031 and p=0.018). No significant difference in the duration of surgery (non-parametric Mann-Whitney test; p=0.306) nor incidence of perioperative complications (non-parametric Mann-Whitney test; p=0.018) were observed in either group.

Laparoscopic gonadectomy using either device provides reliable hemostasis with a minimum of perioperative complications. Both the HS, and the ED, are safe options in laparoscopic gonadectomy of bitches and it is the surgeon’s choice which to utilize.
COMPARISON THE EFFICACY OF MELOXICAM AND KETOPROFEN IN ALLEVIATING PAIN FOLLOWING OVARIECTOMY IN RATS

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Objective: The purpose of this experiment was to compare the efficacy of two NSAIDs, meloxicam and ketoprofen in controlling post-operative pain following ovariectomy in rats.

Study design: Experimental study

Animals: Twenty one healthy and adult female Sprague-Dawley rats weighting approximately 200gr.

Methods: Intramuscular injection of the combination of xylazine (10 mg/kg) and ketamine (75 mg/kg) was used to induce general anesthesia in all rats. Then the selected rat was assigned for a group prior to surgery in the following order: Group A, received no extra analgesic, group B, received subcutaneous injection of 5 mg/kg ketoprofen at the time of induction of anesthesia and group C received subcutaneous injection of 2 mg/kg meloxicam (7.5 mg/ml) at the time of induction of anesthesia. Then Ovariectomy was performed through two ventro-lateral abdominal incisions. Score of pain at 2, 4 and 24 hours after the surgery using VAS, serum levels of cortisol and CPK at 2 hours after the surgery were evaluated in all rats.

Results: The score of pain was significantly different in group A, compared to group B and C (P=0). Also the concentration of cortisol was significantly increased in all groups following the surgery. This increase was significant in group A compared to group B and C (P>0.05). Although CPK concentration was increased significantly in all groups after the surgery, no significant correlation was found among groups.

Conclusion: It is concluded that either meloxicam or ketoprofen have similar effects in controlling pain following ovariectomy in rats.
BRIDGING PLATE DEVELOPED FOR TREATMENT OF SEGMENTAL BONE DEFECT OF THE CANINE MANDIBLE – MECHANICAL TESTS AND FEM

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Topic: 5. Canine and Feline Surgery / Orthopedics

The aim of this study was to develop a locking bridging plate for treatment of segmental bone defect of the canine mandible by using monocortical locked screws. Computerized tomography images of the head of three clinically healthy adult dogs (Rottweiler, Doberman and Boxer) were used as model to develop the mandible prototypes with segmental bone defect. The mandibles were reconstructed with the plates and locked screws that were used for the mechanical tests and finite element modeling (FEM). According to breed dogs, the mean values were: 1998N (Rottweiler), 1844N (Doberman), and 1638N (Boxer) for maximum force; 11.46mm (Rottweiler), 9.73mm (Doberman), and 12.25mm (Boxer) for maximum deflection; and 186.90 N/mm (Rottweiler), 188.70 N/mm (Doberman), and 139.50 N/mm (Boxer) for relative rigidity. Comparing these results with bite force measurements determined for dogs with similar body weight (LINDNER et al., 1995) was observed that to lesser chewing enthusiasm the plate-mandible system resisted 10 times the bite force values for mesaticephalic large breed dog (Rottweiler), 46 times for dolichocephalic large breed dog (Doberman), and 24 times for brachycephalic medium breed dog (Boxer). The FEM showed safety factor that varied from 2.79 to 15, with prevalence of 15 for most bridging plate surface. Considering that values of the safety factor greater than 1 express the von Mises tension inferior to the limits of drainage, it is was possible to conclude that this bridging plate provided adequate resistance.
EFFECTS OF NEWLY DEVELOPED ENDOTRACHEAL TUBE WITH COMPRISING CORRUGATED CUFF IN DOGS

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Topic: 5. Canine and Feline Surgery / Soft Tissue Surgery

The cuff within the endotracheal tube plays very important roles during inhalant anesthesia. Various cuffs have been continuously researched and developed so far, but none was successful in the effort to completely eliminate complications. It is essential to develop a cuff providing uncompromised function, while reducing specific complications. This study determines the efficacy of newly developed endotracheal tube with comprising corrugated cuff in dogs. Endotracheal tubes with 2 or 3 comprising corrugated (CC) cuff were developed and size was 7.0 in internal diameter. Five beagle dogs were anesthetized for 2 hours and the effects of corrugated cuff were evaluated with tracheal mucous membrane by trachea endoscope. Tracheal mucosa was examined with bronchoscope before and after anesthesia in three different conditions: 1) cuff was expanded as tightly as possible, 2) cuff was expanded minimally to prevent gas leakage and 3) newly developed CC cuff applied. Tracheal rings were identified clearly with minimal edema in low pressure and CC cuff groups, however, severe edema was found in high pressure cuff group. Since newly developed cuff of the endotracheal tube has a corrugated shape on an outer surface when expanded, the cuff is able to prevent entry of fluid or solids into trachea and gas leakage during positive pressure ventilation. Moreover, CC cuff greatly reduce incurrence of complications after use of the endotracheal tube such as ischemic damage or sore throat by minimizing contact surface between the cuff and the tracheal mucous membrane.
THE INFLUENCE OF LOW LEVEL LASER THERAPY ON BONE HEALING IN RAT MODEL

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Low level laser therapies (LLLT) have analgesic, vasodilatory and anti-inflammatory effects. LLLT has frequently been used in several health fields. However, whether LLLT can be useful as a treatment modality in hard-tissue healing has not been determined. The purpose of the present study is to evaluate the effects of LLLT with an In-Ga-As diode laser (808 nm) device on the healing of surgically created cortical bone defects in rat tibial fractures. Forty-eight, 8-week-old, male Sprague-Dawley rats were used for this study. After creating the tibial fracture model, the animals were randomly divided into laser therapy and control groups. The animals were euthanized for histopathological and radiological evaluation. The biomechanical strength of the fractures was evaluated using a bending test. The histopathological and radiological evaluations suggested that the laser group developed new bone formations much earlier than those from the control group after 1 and 3 weeks post-surgery (p<0.05). The maximum tolerance force of the laser group was significantly higher than that of the control group (p<0.05). This study revealed that diode laser irradiation increases bone formation in the initial stages of the healing process, and significantly enhances the biomechanical strength of newly formed bone tissues. These findings suggest positive effects of LLLT in accelerating the bone healing process, especially in the early stage of bone formation.
CURE OF PATELLAE LUXATION IN SMALL BREEDS OF DOGS WITH COMBINED SURGICAL TECHNIQUE

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On our clinic for cure of patellae dislocation we use combination of deepening of trochlear drain with insection of cartilage, installation of resorptive thread around lateral fabela to ligamentum rectum patellae and fixation on tuberositate tibiae and technique of imbrication.

This technique was performed in 66 dogs from year 2009 to 2012. In 7 cases (10.6%) also desmotomy of femoropatellar ligament was done. They recieved antibiotic and analgesic therapy. Two weeks after operation was first clinical control with suture removal, and second control after two months. Limping, joint flexibility and luxation of patellae in flexion, extension and rotation were controlled.

In 52 patients (78.8%) was noticed medial, in 8 patients (12.1%) double and 6 patients lateral dislocation. In 36 (54.5%) bilateral dislocation was noticed. 40 (60.6%) dogs were younger than 3 years. Normal functional activity of joint was achieved in 4 to 7 weeks. Two months after operation dislocation can not be produced. In 4 dogs (6.1%) there were complications in wound healing, and in 9 dogs (13.6%) joints become thicker but not warm and painless. In 5 cases (7.5%) of luxation IV degree dogs after operation moderately limped but they did not contracted the leg.

This surgical technique is successful in cure of patellae luxation in small breeds dogs because enable normal flexibility of joint after operation. Technique is simple, fast and adequatly stabilize joint also in case of ruptured or injured cranial cruciate ligament. As inadequate was only in cases of heavy patellae dislocation (degree IV).
KINEMATIC PARAMETERS OF DOGS AFTER PECTINEOMYECTOMY, ILIOPSOAS- TENOTOMY AND NEURECTOMY OF THE HIP JOINT CAPSULE

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Topic: 5. Canine and Feline Surgery / Orthopedics

Hip joint kinematics have been described in different ways by several authors. While the lateral denervation is the most performed palliative technique for the canine hip dysplasia, our purpose was to describe the kinematics in dysplastic dogs after pectineomyectomy, iliopsoas tenotomy and neurectomy of the hip joint capsule (PIN).

Thirteen Rottweiler dogs were divided into two groups: healthy (n = 7) and dysplastic (n = 6). With retroreflective markers on skin, the dogs walked on treadmill at 1m/s. A motion-analysis system with three infrared cameras was used to collect and analyze the data. Flexion/extension joint angles, abduction/adduction of the hip, angular velocity and angular acceleration were determined for the hip joint. Five valid trials with five strides in each one were used for each dog before surgery (T₀) and at day 50 (T₁) and day 100 (T₂) after surgery. The independent samples t-test was used to compare data between groups and treated dogs data over time were analyzed by linear models for repeated measures and Bonferroni correction was used for multiple comparisons (P < 0.05).

Flexion was higher for dysplastic (107.78° ±5.85) than healthy dogs (113.05° ±5.34). Pre and post operative kinematics showed differences only for ab/adduction range data with T₀>T₁ and T₂>T₁.

Clinical assessment showed pain relieving and improvement in lameness score. These results showed changes of kinematic parameters in dysplastic dogs but PIN technique seems not to improve these parameters.
KINETIC PARAMETERS OF DOGS AFTER PECTINEOMYECTOMY, ILIOPSOAS- TENOTOMY AND NEURECTOMY OF THE HIP JOINT CAPSULE

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Topic: 5. Canine and Feline Surgery / Orthopedics

Kinetic analysis of dysplastic dogs have been described using different equipments by several authors. The force plate is frequently used but pressure-sensitive walkway (PSW) can provide temporospatial data. Our purpose was to describe the kinetic and temporospatial changes in dysplastic dogs after pectineomyectomy, iliopsoas tenotomy and neurectomy of the hip joint capsule (PIN).

Thirteen Rottweiler dogs were divided into two groups: healthy (n = 7) and dysplastic (n = 6). Each dog walked on PSW at 0.9-1.1m/s to obtain five valid trials. Data collection occurred before surgery (T₀) and at 50 (T₁) and 100 (T₂) days after surgery. The independent samples t-test was used to compare data between groups and treated dogs data over time were analyzed by linear models for repeated measures and Bonferroni correction was used for multiple comparisons (P < 0.05).

Percentage of stance (67.19 ±2.074), vertical impulse (30.86 ±4.41 %BW/s) and peak vertical force (78.55 ±12.10 %BW) of the forelimbs were significantly higher in dysplastic dogs. Over the time, the treated dogs showed higher values for stance time and gait cycle time at T₂, for stride length at T₀, for peak vertical force and vertical impulse at T₁. Clinical assessment showed pain relieving and improvement in lameness score. These results showed changes in kinetic and temporospatial parameters that indicates improvement of the hind limbs use in dysplastic dogs after the PIN technique was performed.
TREATMENT OF TRACHEAL COLLAPSE IN A DOG WITH A STENT

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Topic: 5. Canine and Feline Surgery / Soft Tissue Surgery

The canine tracheal collapse is characterized by the flattening of tracheal cartilages and / or flaccid dorsal tracheal membrane. The aim of this study was to report the placement of an endoluminal silicone prosthesis with the combination of rigid and flexible endoscopy in a Pit Bull. Tracheobronchoscopy detected fourth grade dynamic tracheal collapse in distal trachea and both primary bronchi. The patient was placed in a sternal recumbency with the head elevated and a mouth gag. It was intubated with a 7,5 mm rigid Chevallier bronchoscope with distal lighting and a 12 mm tracheoscope Dumon. This tube allowed the oxygenation and ventilation of the patient. Once the tracheoscope was placed, the bronchoscope was withdrawn and a 5 mm fiberscope was introduced through the Dumon and the place to release the prosthesis was decided. The chosen prosthesis is inserted in the releasing device with the ejector into the rigid endoscope. Conducting pressure from outside of the patient, the prosthesis is released. A silicone prosthesis of 14 x 16 mm was placed in the trachea; there was a reduced invasion of the tracheal lumen by the dorsal membrane. A decrease in primary bronchi collapse was also detected. The result in this dog was encouraging and it suggests that silicone endoluminal prosthesis could be considered as part of the treatment of this disease. Its use in a greater number of patients and a comparison with the results of other techniques remains to be assessed.
COMPARISON OF LAPAROSCOPIC AND VENTRAL MIDLINE GASTROPEXY OPERATION ON DOGS

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Topic: 5. Canine and Feline Surgery / Soft Tissue Surgery

Gastric dilatation and volvulus (GDV) are acute and often fatal disease syndrome of uncertain aetiology that requires rapid medical and surgical intervention. In this study, ventral midline gastropexy and laparoscopic gastropexy which are effect of prophylaxis of GVD were compared for prognosis and surgical intervention.

Twelve skeletally mature dogs of unselected breed, ages and sex, weighing between 15 ± 5 kg were used. Six dogs were used for ventral line gastropexy. The stomach is moved back into its physiologic position and a continuous suture pattern were used. Six dogs were used for laparoscopic-assisted gastropexy. Abdominal cavity entrance, Hasson technique was used. The abdominal cavity was filled with 13 mmHg CO₂ for pneumoperitoneum. Pyloris was found by the aid of the telescope. Then the telescope is directed towards the right abdominal wall. Under the guidance of the telescope on the right abdominal wall incision was made 2 cm below the last rib. The abdominal cavity was entered with endobobcook penset. Pyloris of stomach was kept and pyloris was sutured of the right side of the stomach.

At the end of the study, both techniques, laparoscopic and conventional gastropexy can be applied for emergency surgery and prophylactic interventions. There was no complications encountered in animals. Wound healing in laparoscopic gastropexy group were found to be faster because of the small incision line.
Mandibulectomy for Treatment of Fractures Associated with Severe Periodontal Disease

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Topic: 5. Canine and Feline Surgery / Orthopedics

The purpose of this study was to evaluate retrospectively cases of mandibular fractures associated with severe periodontal disease that were treated by mandibulectomy due to bone loss. A total of 8 dogs aged 6 to 15 years (mean 11.25) were studied: 25% were Poodle (n=2), 25% Yorkshire (n=2), 12.5% Cocker Spaniel (n=1) and 37.5% crossbred (n=3). In addition the advanced periodontal disease, 50% of the cases had history of fighting with other dogs, 25% had been hit by a car, 12.5% had fallen from high, and 12.5% showed pathological fracture. Fractures occurred bilaterally in five dogs and unilaterally in three dogs. According to fracture type, 50% were simple transverse, 25% comminuted, 12.5% oblique simple, and 12.5% double. For fractures that occurred in the rostral portion of the mandible (25%), one was treated with rostral mandibulectomy, and one with rostral hemimandibulectomy. For fractures in the middle third of the mandible body (62.5%), four were treated using partial mandibulectomy and one with partial hemimandibulectomy. One fracture that affected rostral and caudal portion of the left mandibular body was used the partial hemimandibulectomy. All cases had a good evolution and without significant complication. In conclusion, most of the dogs submitted to mandibulectomy due periodontal disease in this study were small size, old age, and suffered a traumatic event.
CLINICAL EXPERIENCE OF INTERLOCKING NAIL STABILIZATION OF DOGS WITH LONG BONE FRACTURES

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Topic: 5. Canine and Feline Surgery / Orthopedics

The aim of the study, using of “Interlocking Nailing System” on dogs with long bone fractures were examined for fracture healing effects by clinically and radiographically.

Nine dogs, different size and age were used as a materials. The distributions of fractures were 3 humerus, 3 tibia and 3 femur. Modified interlocking nailing set were produced by OrthoVet, Izmir, Turkey. Six (150-190 mm) and 8 (150 to 230 mm) mm diameters nails were used. There is one screw hole at the proximal of the nail and two other holes at the distal. A process located distally on the nails was designed for the attachment of the guide. Cranio-caudal and mediolateral radiographs were taken postoperatively in order to view the results of the procedure.

Three out of 9 fractures were located in the middle third, 6 in the distal third. Four oblique, two segmental and three transversal fracture were detected. Postoperatively initial radiographs were immediately taken after operation and fixation was evaluated. Especially, adaptation of the screws holes on the nail was evaluated in these radiographs. Series radiographs were repeated on 21st, 28th, 2 months and 6 months. No changes were detected regarding stability in none of the cases. In all cases, clinical fracture healing was completed around 21st days. Excessive callus tissue was also observed for some cases. The nails were not removed all of the cases.

Conclusion of the study that interlocking nail could be alternative to other osteosynthesis methods. The system can satify practioner and the patient.
CLINICAL OUTCOME IN 100 DOGS WITH SPINAL CORD INJURY TREATED MEDICALLY OR SURGICALLY (2010-2013)

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Topic: 5. Canine and Feline Surgery / Orthopedics

Introduction: The purpose of this study was to compare the clinical outcome for surgical and medical therapies of 100 dogs treated at one institution, and to compare two medical therapies - NSAID and dexamethasone, as well as to point out the positive effect of dexamethasone therapy, especially where, for any reason, cannot be performed the surgical therapy.

Material and methods: Signalment; duration of clinical signs; modified Griffiths score (MGS), findings of imaging diagnostics; lesion localization; treatment and outcome after 3-48 months were analyzed. Surgical therapy was indicated for 42 dogs (15 treated surgically, 27 medically). Dogs not undergoing surgical therapy were treated with NSAIDs (n=20) (dose 2 mg/kg) or corticosteroids (n=54) (namely tapered dose of dexamethasone over three days from 2.0 mg/kg to 0.5 mg/kg) or were euthanized (n=11).

Results: NSAIDs were used in dogs with moderate clinical signs (meanMGS=2) compared to dexamethasone and surgery (meanMGS=2.5). The success rate for NSAIDs was 90% (18/20 dogs). When using dexamethasone with restriction of movement (including the neck brace), there was evident relief of clinical signs in 47 of 54 dogs (87%). 14 out of 15 dogs showed improvement after surgical therapy (93.3%).

Conclusion: The success rate of therapies increases in order dexamethasone, NSAIDs, surgical therapy. Despite this fact, dexamethasone is still an acceptable choice for spinal cord injury treatment, in addition with minimal side effects when using with H2-receptor antagonists.

Supported by: VEGA 1/2945/12.
SONOGRAPHIC DETERMINATION OF RESIDUAL BLADDER VOLUME AFTER APPLICATION OF DIFFERENT CYSTOTOMY CLOSURE TECHNIQUES IN DOGS

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Topic: 5. Canine and Feline Surgery / Soft Tissue Surgery

Residual urine volume is measured to diagnose various neurogenic and obstructive disorders of the urinary bladder. Inverting suture patterns are thought to decrease the intraluminal diameter of urinary bladder which consequently reduces the residual bladder volume. The effect of two-layer appositional, two-layer inverting and three-layer closure techniques on residual bladder volume was studied sonographically in dogs. The experimental study was conducted on 24 mongrel dogs, divided into four groups A, B, C and D, comprising 6 dogs each. In groups A, B and C the cystotomy incision was subsequently closed by two-layer appositional suturing pattern, two-layer inverting pattern and three-layered pattern, respectively. Group-D served as control and cystotomy was not performed in this group. The suturing patterns were sonographically evaluated for their effects on residual bladder volume in groups A, B and C. Sonographic measurements of bladder length, width and depth (on sagittal and transverse scans), were used to calculate the residual bladder volume through the formula: \( L \times W \times (D_L + D_T)/2 \times 0.625 \). Consequently, the three-layered closure technique, applied in Group C animals, was found to reduce the bladder volume significantly (\( P \leq 0.01 \)), evidenced by a remarkable stricture on postmortem evaluation. Reduction in bladder volume after application of two-layer inverting suture pattern was not significant, whereas, the two-layer appositional technique depicted minimal effects on residual bladder volume. It was thus concluded that the appositional suturing technique should be preferred for the closure of cystotomy incision over the three-layer technique because it exerts the least effect on residual bladder volume.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Mean Bladder Volume ( \mu \text{L} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>( 551 \pm 254 )</td>
</tr>
<tr>
<td>B</td>
<td>( 789 \pm 441 )</td>
</tr>
<tr>
<td>C</td>
<td>( 1140 \pm 590 )</td>
</tr>
<tr>
<td>D</td>
<td>controls</td>
</tr>
</tbody>
</table>

**Table 1: Changes in Mean Residual Bladder Volume before and after application of Different Suturing Techniques for Cystotomy Incision Closure**

**Table 2: Changes in Frequency of Stricture resulting from Different Suturing Techniques for Cystotomy Closure**
USE OF ACRYLIC RESIN IN THE TREATMENT OF NONUNION MANDIBULAR FRACTURE IN A DOG

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Topic: 5. Canine and Feline Surgery / Orthopedics

A 1-year-old crossbred female dog was presented due to the inability to close the mouth. The animal was found abandoned on the street. Oral examination and skull radiographs demonstrated nonunion fracture of the left mandible with severe displacement and mandibular symphyseal separation. The inability to close the mouth was due to nonunion. The treatment included removal of the fibrous nonunion, and acrylic bonding the maxillary and mandibular canine teeth together (intermaxillary blocking) to restore normal occlusion. The mandibular incisor teeth were included to provide stabilization of the mandibular symphyseal separation. Acid etched was used over the teeth for bonding acrylic resin. Radiographic examination 3.5-months following treatment demonstrated partial body union of the left mandible oblique fracture and union of the mandibular symphysis. After removal of the acrylic resin, the dog showed significant improvement of the mouth occlusion with functional use of the mandible.
COMPARISON OF DYNAMIC COMPRESSION PLATE AND ACRYLIC EXTERNAL FIXATOR FOR LONG BONE FRACTURES IN DOGS BY CLINIC AND RADIOGRAPHIC METHODS

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Topic: 5. Canine and Feline Surgery / Orthopedics

The purpose of this study was to evaluate the clinical and radiographic findings of dynamic compression plate (DCP) and acrylic external fixator (AEF) applications for the treatment of long bone fractures in dogs and to assess treatment results and complications encountered.

In this study, 32 dogs were used from various breeds, ages and gender referred by private clinics in suspicion of broken leg. AEF technique was applied to 6 patients suffering from humeral fracture and 8 patients from tibia fracture. DCP was applied to 9 patients with radial fracture and 9 patients with femoral fracture. Postoperative clinic and radiographic examinations for each patient were carried out for at least 35 days and treatment results compared.

There was a statistically difference between AEF and DCP (p<0.01) when the cases were compared for direct and indirect recovery at the day of 35 postoperatively. Direct recovery rate was 2.4 times stronger than indirect recovery (p<0.01) for DCP compared to AEF. There weren’t significant difference between functional recovery and slight lameness for two techniques (p>0.05). Furthermore, dogs were statistically compared for callus formation, fracture line and lameness score at the day 7th, 14th, 21st, 28th and 35th and no statistically difference found between the DCP and AEF (p>0.05).

As a result, it was deduced that both methods were suitable for long bone fractures treatment but AEF applications might be used more widely in clinical practice because of economical considerations and easy access.
Perineal hernias occur when the muscles of the pelvic diaphragm weaken resulting in loss of support to the rectum allowing the terminal portion of the digestive tract and other abdominal organs to herniate through. Depending on their location, they may be referred to as caudal, sciatic, dorsal, or ventral. The cause of pelvic diaphragm weakening is poorly understood but in our experience, most occur after chronic tenesmus resulting from prostatic enlargements.

Methods described include simple herniorraphy to close the defect directly, implantation of various prosthetic biomaterials, and the use of internal obturator or superficial gluteal muscles. Complications include deformities of the perineal region, wound breakdown, difficulties in revision surgeries when breakdowns occur, excessive fibrosis and delays in wound healing when using biomaterials, and lack of sufficient muscle in muscular repairs.

Here we describe a more anatomic, simple and reliable repair procedure, even in the presence of severe muscular atrophy, and for revision surgery. We run through the step-by-step use of a split semitendinosus muscle flap, by function preservation technique, (proximal muscle blood supply via caudal gluteal artery and vein are preserved, and distal muscle blood supply via distal caudal femoral artery is also preserved) in the repair of perineal hernias in dogs. Split muscle flaps have been used increasingly in human medicine to fill defects and provide support, while preserving the function of the muscle of origin. This may be an important consideration in working dogs. To date, we have not had any failures with this technique.
TECHNICAL ASSESSMENT OF SUBTOTAL AND PARTIAL PERICARDIECTOMY BY THORACOSCOPIC METHOD VIA TRANSDIAPHRAGMATIC CAMERA PORT

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Topic: 5. Canine and Feline Surgery / Soft Tissue Surgery

Subtotal pericardiectomy under subphrenic level via thoracoscopic method has technical difficulties because anatomic positions of heart base structures and base apex direction of dog’s heart. In this study fourteen male mixed breed dog randomly divided to two equal groups for pericardiectomy by a three port camera and instrument placement. One group (seven dogs) for subtotal and another group for partial pericardiectomy. Intraoperative findings such as duration of anesthesia, duration of surgical procedure, blood loss, respiratory disorders, capnographic changes, pulse oximetry, electrocardiography changes, blood pressure and technical difficulties during surgery recorded. Central venous pressure, arterial blood pressure changes, heart and respiratory rate, electrocardiography changes and stress parameters such as plasma glucose and cortisol, cell blood count and numerical pain scoring and finally adhesions on day twenty first post operation were evaluated. Events during anesthesia and intraoperative complications recorded by video screen of thoracoscopic set were used to describe technical assessment of this approach and explanation of its preference. Intraoperative hemorrhage statistically was more in total pericardiectomy group. Increase of central venous pressure was also statistically more in total pericardiectomy group. No statistically differences were seen between two groups in other parameters. Evaluation of results shows paraxiphoid transdiaphragmatic approach is suitable for camera port placement in pericardiectomy procedure via thoracoscopy. Results also determined this approach is feasible for total pericardectomy and in comparison of partial pericardiectomy with same approach although it is more difficult but it has no more intra and post operative complications.
ID: 357

MANAGEMENT OF JUXTA-ARTICULAR TIBIAL FRACTURES OR TARSAL JOINT INSTABILITIES WITH TRANSARTICULAR MINI-VETFIX ESF SYSTEM IN CATS

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Topic: 5. Canine and Feline Surgery / Orthopedics

Objective: To present a novel technique for the treatment of juxta-articular tibial fractures or tarsal joint instability in cats.

Methods: Fifteen cats of different breed, age and sex with hock instability occurred after high-energy trauma were enrolled in the study. A mini circular ESF system composed of 40 and 50 mm full and half rings, 3 mm connecting rods, nuts, 2 mm negative profile end-threaded half pins, half pin fixation bolts, and 1 mm K-wires and their bolts. Frames were composed of 2 half rings and 2 full rings connected with 135° flexion connected rods in transarticular fashion. Fixation implants were two 2 mm negative profile end-threaded half pins for tibia and two transcortical 1 mm full K-wires for metatarsal bones. Data recorded was signalment and history, fracture description, postoperative complications, concomitant injuries, time to first use of limb after the operation, time of fixator removal, and outcome. Final assessments were determined according to clinical and radiological outcomes.

Results: All of the surgically treated lesions obtained fracture healing or fusion. Five of the cats started to use the limb immediately after recovering from anesthesia, in the rest 10 cases the time ranged from one to three days. Time to fixator removal ranged from 21 to 35 days. Final outcome was excellent in 12 cases, and good in two cases.

Clinical significance: The technique was found to be a minimal invasive and convenient method for the treatment of hock instability in cats.
DEGRADATION OR REPAIR IN OSTEOARTHRITIS; WHICH ONE IS PREDOMINANT? (MEASUREMENT OF INTERLEUKIN-1ß AND 6 IN SYNOVIAL FLUID)

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Topic: 5. Canine and Feline Surgery / Orthopedics

Osteoarthritis is a degenerative process which involves different structures of the synovial joints. Degradation and repair of the articular cartilage-as the most important involved structure- are being investigated by measuring Interleukin (IL) 1ß and IL-6 as joint markers of degradation and repair respectively. To evaluate this, five mature, large, mixed breed, male dogs were used for this study. Synovial fluids were obtained from joints by aseptic arthrocentesis once before cranial cruciate ligament (CCL) rupture and on days 14, 28, 90 and 180 after CCL transaction. Statistical analysis of the results showed that both cytokines had an increasing pattern. IL-1ß showed significant increase after six months and IL-6 showed a non significant increase. There was no significant correlation between these cytokines during the study. We concluded that, although both degradation and repair is in progress in osteoarthritic joints, degradation is predominant to repair when no treatment is performed to stop the process.
MEASUREMENT OF NITRIC OXIDE AND NITRIC OXIDE/URINE CREATININE RATIO IN OSTEOARTHRITIC DOGS AS AN OSTEOARTHRITIS PROGRESSION INDEX

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Topic: 5. Canine and Feline Surgery / Orthopedics

Early diagnosis of Osteoarthritis (OA) has always been a topic of concern in both veterinary and human medicine. Many invasive and non invasive techniques have been applied to facilitate the diagnosis. The present study was conducted to measure the urine Nitric oxide (NO) and NO/urine creatinine ratio (UNCR) as markers of osteoarthritis diagnosis or osteoarthritis progression. Total urinary nitrate and nitrite (NOt) was considered as a reflection of NO. Urine samples were obtained before and 2, 4, 12 and 24 weeks post cranial cruciate rupture. Data analysis showed that there was no significant difference in NOt during the study. There was a significant difference in creatinine and subsequently UNCR 24 weeks post surgery when compared with 4 weeks post surgery. It was concluded that measuring urinary NO or UNCR in osteoarthritic patients is of no value for clinical use.
ID: 387

MANAGEMENT OF JUXTA-ARTICULAR DISTAL TIBIAL FRACTURES OR TARSAL JOINT INSTABILITIES WITH TRANSARTICULAR SEMICIRCULAR-CIRCULAR HYBRID ESF SYSTEM IN DOGS

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Topic: 5. Canine and Feline Surgery / Orthopedics

Objective: To present a novel transarticular fixation technique for the treatment of juxta-articular tibial fractures or tarsal joint instability in dogs.

Method: Seven dogs of different breed, age and sex with hock instability occurred after high-energy trauma were enrolled in the study. The principal connecting elements of semicircular ESF used were 6 hole 45° (180 mm inside diameter, 1/8 ring arch, 7x18x85 mm) carbon-fiber arches. The other components of the system were 6 mm diameter threaded rods, half pin fixation bolts, 6 mm nuts, 4 mm diameter negative profile end-threaded half pins. 80, 100 and 120 mm carbon-fiber full rings were hinged to the semicircular frames to form the hybrid ESF system. Data recorded was signalment and history, fracture description, fixator configuration, postoperative complications, concomitant injuries, time to first use of limb after the operation (bearing weight when walking on leash), time of fixator removal, and outcome. Final assessments were determined according to clinical and radiological outcomes.

Results: All of the surgically treated lesions obtained fracture healing or fusion. Fixator tolerance was good to excellent in all cases. Time to first use of the limb ranged from 2 to 7 days following surgery. Time to fixator removal ranged from 28 to 42 days. Final outcome was excellent in 5 cases, and good in two cases.

Clinical significance: The technique was found to be a minimal invasive and convenient method for the treatment of distal tibial fractures and hock instability in dogs.
EFFECTS OF POLYAXIAL PEDICLE SCREW FIXATION ON DEGENERATIVE LUMBAR SACRAL STENOSIS IN DOGS

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Topic: 5. Canine and Feline Surgery / Orthopedics

Degenerative lumbosacral stenosis (DLS), the most common cause of caudal lumbar pain in large breed dogs, can be observed in conjunction with fibroid disc degeneration, and degenerative bone and soft tissue changes. The most commonly performed operative treatment for DLS is partial (dorsal) discectomy with or without a dorsal laminectomy performed. Pedicle screw fixations are also used in dogs with DLS for stabilizing the L7-S1 joint range.

In this study, we were aiming to investigate the efficiency of the stabilization provided by the polyaxial pedicle screw fixation after the dorsal laminectomy and partial discectomy in large breed dogs (> 25 kg) suffering from DLS, together with avoiding the destabilization which causes the clinical findings to repeat in the future.

After MRI scans of the 12 cases with neurological symptoms brought to the our clinic, it was found that they were suffering from disc hernias (Hansen Type 2) between the L7-S1 ranges. All the patients’ lumbosacral regions were stabilized with 3.5mm diameter polyaxial pedicle screws after the dorsal laminectomy and discectomy. It was observed that in 24-48 hours post-operation the patient’s neurological complaints fell and after a week the movements of the dogs returned to normal. In the long-term (12 months) follow-up clinical and radiographic examinations it was observed that there was no loosening in the pedicle screw and connecting and the stabilization was preserved.

Using polyaxial pedicle screws for the surgical treatment of DLS, we provided a rigid stabilization which reversed the neurological deficit quickly.
OBSTRUCTION OF GASTROINTESTINAL TRACT BY FOREIGN BODIES (EAR RING) IN DOGS

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Ingested foreign bodies are common in small animals and may lead to obstruction of the gastrointestinal tract. Owners may sometimes feed their dogs unconsciously, giving them objects like cattle ear rings. Radiopaque foreign bodies may be identified; however, the radiographic signs that accompany mechanical obstruction of the small intestine can vary with the degree, duration, and location of the obstruction and are usually not specific. In this report, operative treatment of intestinal obstruction (mechanic ileus) due to ear rings in four dogs, three male and one female aged between 3 and 4 years, were carried out under general anaesthesia. The clinic symptoms for foreign body obstruction were anorexia, vomiting, and calming. Following general examination, radiographic examination of the abdomen was made for any suspicious disorders and radiopaque foreign bodies were seen in the pylorus and small intestine. For the treatment, laparotomy was decided. Obstructed small intestine and pylorus were explored following laparotomy. The incision was made from the cranial side of the foreign body (ear ring) and the rings were removed. In the postoperative period, only intravenous fluid was administered for three days before starting oral feeding. In this report, causative factor was very important in a dog with anorexia, vomiting, dehidration, and calming rather than symptomatic treatment. We concluded that the animals having such complaints should be examined systematically because making a thorough and early diagnosis would influence the success of the treatment positively.

Key Words: Ear ring, dog, gastrointestinal tract
SURGICAL REPAIR OF A TRICEPS TENDON PARCIAL RUPTURE USING AN ALLOGRAFT PRESERVED AURICULAR CARTILAGE MESH IN A DOG

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Topic: 5. Canine and Feline Surgery / Soft Tissue Surgery

A triceps tendon rupture is an uncommon condition in dogs. A partial or total rupture usually occurs at the osseous-tendinous junction, and it can result in limited elbow extension and in an inability to bear weight. An 8-year-old, 2.7kg, spayed female mixed-breed dog was referred to the Veterinary Hospital for the evaluation related to lameness, having shown a decreased capacity for bearing weight in the right forelimb for a month. In the physical and orthopedic examinations, a flexion and slight medialization of the elbow were observed, as well as grade IV lameness in the right forelimb. A firm rounded mass measuring 2.5cm could be palpated in the distal portion of the humerus. A thinning triceps tendon was also noticed in the same area. A radiographic evaluation showed articular incongruity in the elbow joint. An ultrasonographic exam showed a hypoechoic area with loss of continuity of muscle fibers, suggesting a partial tendon rupture at the insertional level (rupture > 50% of total tendon area) and scar tissue formation. The surgical repair included resection of scar tissue and tenorrhaphy using a nonabsorbable monofilament Bunnell-Mayer pattern suture. The suture was reinforced by an allograft auricular cartilage mesh preserved in 98% glycerin and fixed by simple an interrupted appositional pattern suture with absorbable monofilament material. The post-operative treatment included rest and a spica splint for 30 days, in addition to physical rehabilitation for 3 months. In the last evaluation four months postoperatively, the dog used the right forelimb for motion with no lameness.
EVALUATION OF ANTIOXIDANT ENZYMES IN SYNOVIAL FLUID IN OSTEOARTHRITIS IN DOGS

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Topic: 5. Canine and Feline Surgery / Orthopedics

Osteoarthritis (OA) of the knee is a common, age related joint disorder associated with loss of articular cartilage and secondary synovitis. Recent studies have shown that reactive oxygen species may participate in the initiation and progression of OA. This study examines potential changes in the activities of antioxidant enzymes (Super oxide dismutase, Glutathion peroxidase and Catalase) in synovial fluid of OA patients and estimates their relationship to the degree of lipid peroxidation in synovial fluid evaluated by malondialdehyde concentration. SOD, GPX, CAT and MDA was measured in synovial fluid before and 2, 4, 12 and 24 weeks after OA initiation. Data analysis showed statistically significant increase in synovial fluid antioxidant enzymes 2 and 4 weeks after surgery when compared to the control (p<0.05). In conclusion, antioxidant status is due to the stage of the OA, chronic joint involvement may deplete antioxidant defenses whereas acute one can upgrade them. Antioxidant enzymes measured in synovial fluid showed no significant relevance to these enzymes in blood.
EVALUATION OF CLINICAL SIGNS IN LARGE BREED DOGS AFFECTED BY LUMBOSACRAL STENOSIS AND HIP DYSPLASIA

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Topic: 5. Canine and Feline Surgery / Orthopedics

Degenerative lumbosacral stenosis and hip dysplasia are common disorders seen mainly in large breed dogs. The aim of study was compared to the predominant clinical signs in large breed dogs which presented both diseases. Eleven dogs, 7 males and 4 females, weighing 30 to 55 kg, and aged from 1 to 11 years were used. The evaluation was based on history and it included: clinical signs combined with the results of orthopedic and neurologic examinations. For diagnosis, they were submitted to standard hip dysplasia radiography, lateral radiograph view of the lumbosacral area and computed tomography (CT) images of the L7-S1 region. All selected dogs had hip dysplasia in radiograph evaluation but we did not consider the FCI-scoring. In the clinical examination, all dogs (100%) presented pain of the lumbosacral area (hyperextension of the caudal lumbar spine with lumbosacral pressure, tail hyperextension, or lumbosacral pressure test). Crepitus was detected during palpation of the hip joint in 81.8% (9/11) of the dogs. Propioceptive deficits in the hind limbs were observed in 54.5% (6/11) of the dogs. Central disc herniation was observed in 90% of the CT images and the grade of severity varied from 41% (moderate, <50% of the spinal canal diameter) to 60% (severe, >50% protrusion). Severe clinical signs were more frequently observed in severe grades of compression. Dogs affected by degenerative lumbosacral stenosis and hip dysplasia in the this study presented predominant clinical signs of degenerative lumbosacral stenosis suggesting treatment priority.
ULTRASONOGRAPHY OF INTERVERTEBRAL LUMBOSSACRAL SPACE IN DOGS

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Topic: 5. Canine and Feline Surgery / Orthopedics

The aim of this study was to standardize the ultrasound image of the lumbosacral intervertebral space in dogs, regarding the topography, echogenicity, echotexture and the relations among its structures; to evaluate the ultrasound accuracy in predicting the depth of the epidural space in three planes, such as median longitudinal, paramedian longitudinal and transverse, by measuring the distance between the skin and the ventral portion of the ligamentum flavum and to evaluate the effects of age, body weight and body condition on the quality of ultrasound images. The means and standard deviations of the measurements obtained by ultrasonography in both longitudinal and transversal planes, and the measurement obtained after epidural puncture were, respectively, 2.66±1.09cm, 2.75±1.11cm and 2.81±1.27cm. In conclusion, ultrasonography is an effective technique to locate and to identify the anatomic lumbosacral structures, and it is valuable to accurately determine the depth of the epidural space. The paramedian longitudinal plane enables the assessment of anatomical structures while the median plane allows the location of the lumbosacral intervertebral space. The transverse plane is recommended to determine the depth of the epidural space. In this study, it was also noticed that there is no effect of age on the quality of ultrasound images; however, there is a negative correlation between body condition and ultrasound image quality, and a positive correlation between the scanning duration and the body weight.