Oral Presentation

December 20-21, 2024

Conference Room 204, Sapporo Convention Center 2F

Day 1	13:00-18:30	(OR 1 - 23)
Day 2	9:00-11:00	(OR 24 - 31)

OR-1

Minimally invasive unilateral biportal endoscopic approach for thoracolumbar intervertebral disc herniation in dogs

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Abstract: This study reports on the feasibility and outcomes of using a unilateral biportal endoscopic (UBE) approach for thoracolumbar decompression in dogs with intervertebral disc herniation (IVDH). Nine dogs diagnosed with thoracolumbar IVDH at a single level, confirmed by magnetic resonance imaging (MRI), were included. The dogs, aged 4 to 15 years (median 9.0 years) and weighing 3.8 to 15.0 kg (median 5.8 kg), exhibited clinical signs ranging from ambulatory to non-ambulatory paraparesis. The dogs were positioned in sternal recumbency, and two skin entry points were established using fluoroscopic guidance. A mini-hemilaminectomy was performed with the UBE system, utilizing one portal for continuous irrigation and visualization and another for instrument manipulation and disc removal. The UBE approach allowed effective spinal cord decompression and removal of extruded disc material, with successful identification of the spinal cord's ventral aspect without causing neurological deterioration. All dogs showed neurological improvement the day after surgery, and at 6 weeks postoperatively, neurological examinations were normal with no complications reported. This case series demonstrates that minimally invasive UBE spine surgery is a safe and feasible technique for accessing the thoracolumbar vertebral canal and the ventral spinal cord in small-breed dogs, providing an effective surgical option for treating thoracolumbar IVDH in canine patients.

OR-2

Cervical intervertebral disc disease in 307 small-breed dogs (2000–2021): A novel concept of intervertebral disc degeneration and associated instability stage

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Abstract: Intervertebral disc disease (IVDD) is the most common cause of spinal cord dysfunction in dogs. Recent reports suggest that IVDD presentation is different among breeds.

This study presents the breed-characteristic features of cervical IVDD (C-IVDD) and associated vertebral instability, method of diagnosis, treatment, outcomes, and a novel concept of intervertebral disc degeneration and associated instability (DI) stage.

Medical records (2000–2021) of 307 small-breed dogs with C-IVDD, diagnosed with myelography, CT or MRI, that underwent decompressive surgery and/or vertebral stabilization were included. The vertebral instability was confirmed in 45 dogs as having dynamic compression by dynamic myelography and/or unstable spinal segment by intraoperative vertebral manipulation. In total, 295 (96.1%) dogs recovered. The age, affected sites (cranial; C2–C5 vs caudal discs; C5–T1) and frequency of vertebral stabilization were compared in six chondrodystrophic (CD) and five non-CD (NCD) breeds by Tukey test and exact binominal test (SAS software version 9.4). Multivariable analyses of the CD vs NCD groups, and vertebral stabilization (dogs stabilized vs dogs not stabilized) were performed by binary logistic regression analysis.

Significant differences in age, affected sites and frequency of vertebral stabilization were noted among the breeds. Older age and frequent vertebral stabilization were the associated factors for the NCD dogs. Male dogs, caudal discs affected and the NCD dogs were risk factors for the dogs with vertebral stabilization. The concept of DI stage is useful to understand the disc-associated vertebral instability. C-IVDD in small-breed dogs potentially has concurrent disc-associated vertebral instability that vertebral stabilization is indicated.

OR-3

Management of medial luxation of the shoulder joint in toy-breed dogs using an antiluxation pin placed lateral to the supraspinatus muscle tendon: 20 limbs (2017–2022)

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Abstract: Successful treatment for medial shoulder luxation (MSL) has not been well described. A novel method of an antiluxation pin (ALP) placed on the caudomedial side of the greater tubercle of the humerus, lateral to the supraspinatus muscle tendon functions as an active stabilizer that prevents MSL. This study describes the outcome of dogs with MSL treated with the ALP. Our hypothesis was that the ALP would prevent re-luxation and improve lameness scores (LMSs).

Records (2017-2022) of toy-breed dogs with MSL treated with the ALP were reviewed. The collected data included signalment, cause of luxation, preoperative and follow-up clinical and radiographic evaluations with LMSs.

Twenty luxations in 18 dogs (Toy poodle dogs: 17, Yorkshire terrier dog: 1) with the median age of 10 years were identified. All but one luxation was unrelated to trauma. All luxations were confirmed using radiography or palpation under general anesthesia. Of the three limbs that re-luxated postoperatively, one limb inserted additional ALP, and the other two limbs underwent no further treatment. One limb with persisted pain underwent two revision surgeries to adjust the pin insertion 30 and 72 days after the initial surgery. Eighteen limbs remained un-luxated after the initial or revision surgery until the final follow-up (median, 18.5 months; range, 1–63). The final follow-up LMSs for the 18 un-luxated limbs were significantly lower than preoperative LMSs by Wilcoxon signed rank sum test (SAS software version 9.4).

The ALP is an alternative treatment for MSL in toy-breed dogs that is minimally invasive and technically simple.

OR-4

Enhancing the accuracy of pedicle screw placement using a modular 3D-printed screw-guiding techniques in the lumbosacral region for small breed dogs: A cadaveric study

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Abstract: A 3D-printed guide is an effective method for accurately placing pedicle screws in vertebrae in dogs. The conventional drill guide only assists in drilling, allowing for an accurate pilot hole, but there is potential for deviation during screw insertion. In this study, a technique that can assist with screw insertion in addition to drilling was applied to address this issue, and the accuracy of screw placement was compared to that of the conventional drill guide. 36 screws were placed on both sides of the L6-S1 vertebral segments of six cadaver dogs (<10 kg). The screws were divided into three groups depending on screw placement methods: Group A(drill guide), group B(cannulated guide), and group C(screw guide). Using medical imaging software (3D Slicer), screw placement accuracy was measured by comparing preoperative and postoperative CT images. Statistical analysis was performed using SPSS, with ANOVA or Mann-Whitney U test followed by a post hoc test. Group A showed the largest angular deviation. Group C showed significantly smaller deviations in entry point, exit point, angle α, and angular deviation than group A. In group B, only the exit point deviation was significantly smaller than group A. Furthermore, the angular deviation of group C was significantly smaller than group B. In conclusion, 3D-printed screw guiding techniques improved the accuracy of pedicle screw placement, with screw guides showing better results than cannulated guide. Using a screw guide in small breed dogs can be a reasonable alternative to enhance the accuracy of pedicle screw placement.

OR-5

Evaluation of synovial gene expression in spontaneous canine osteoarthritis and generation of an in vitro canine synovitis model

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Abstract: Osteoarthritis (OA) is a major cause of chronic pain in dogs. However, the pathogenesis of OA is not fully understood in dogs. In addition, *in vitro* canine models of OA, such as synovitis models, are needed to evaluate the efficacy of new therapeutic agents. The objective of this study was to comprehensively investigate the mRNA expression levels of cytokines and receptors in the synovium of dogs with spontaneous OA and to generate an *in vitro* synovitis model using canine synovial tissue. Dogs with and without OA based on arthroscopic findings were included and synovial tissue samples of stifle joints were collected from the sites where synovitis scores were assessed. Synovial fibroblasts were obtained from the synovium of dogs without OA to generate an in vitro synovitis model using recombinant canine IL-1β. Total RNA was extracted from the synovial tissue and cultured synovial fibroblasts, and RT-qPCR was performed using canine-specific primer sets for *IL1B, IL6, CXCL8, TNF, TGFB1, PTGS2, PTGES, MMP3, MMP13, NGF, NTRK1*, and *PTGER4*. The expression levels of *IL1B, IL6, CXCL8*, and *MMP13* were significantly higher in the high-grade synovitis group than those in the control group. When the mRNA expression levels of the synovitis models were compared between the synovitis and control groups, the expression patterns were similar to those in canine synovial tissue with OA. This study may partially elucidate the pathogenesis of synovitis in dogs with spontaneous OA. Furthermore, the synovitis model generated in this study may be useful for developing new therapeutic agents.

OR-6

Biomechanical assessment and comparison of fixation methods for bilateral sacroiliac joint luxation in 3D-printed feline pelvic bone models

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Abstract: Bilateral sacroiliac joint luxation, a condition primarily observed in cats, can significantly impact their quality of life. This study aims to compare control with three distinct fixation methods to identify the most robust fixation method capable of withstanding significant tensile stress. 20 pelvic bone models of cats were made using a 3D printer with polylactic acid plastic. Each model was assembled by cutting the sacroiliac joints and pelvic girdle symphysis with hand saw, then bonded with cyanoacrylate glue. 3D feline pelvic bone models were categorized into four significant groups, each consisting of five models. The study discovered that the three groups used distinct fixation methods: Two lag screws (DS), K-wires at the ilium wing and sacroiliac joints (TK), and K-wires at the sacroiliac joints (DK). The final group, not fixed, was the control. The results were characterized further through a mechanical compression force test using a universal testing machine. The most robust method at the sacroiliac joints, the DK technique, sustained a maximum force of up to 183.86 N while maintaining the correct bone alignment. The fixation method is more accessible and faster to implement in comparison to the DS method. The DK group exhibits the greatest maximum load capacity among all groups. Sacroiliac joint luxation treatment can effectively be addressed using the K-wires fixation method. However, the DK need space of sacral body same as DS for fixation. Further clinical study should be performed.

This study was supported by faculty of Veterinary Medicine, Kasetsart University

OR7

Targeting tie-2 receptor with rebastinib (DCC-2036) for angiogenesis inhibition in early-stage arthritis: enhanced efficacy through liposomal sustained release

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Abstract: The prevalence of arthritis continues to rise, driving research into new therapeutic approaches. Existing treatments often present limitations. Angiogenesis and pathological changes in the synovium are key contributors to the early development of arthritis. Rebastinib, a tie-2 receptor inhibitor, blocks the activation of tie2-expressing macrophages, which are involved in angiogenesis. While previous studies have highlighted the importance of angiogenesis in early arthritis, few have focused on targeting the tie-2 receptor to slow disease progression. In this study, we evaluated the effects of rebastinib encapsulated in pH-dependent liposomes on a surgically induced arthritis model in rabbits. Additionally, we investigated the efficacy of the pH-dependent liposome formulation, developed using microfluidics technology, for sustained drug release. On the one hand, the results demonstrated that rebastinib-loaded pH-dependent liposomes were stable and provided controlled release. On the other hand, rebastinib effectively inhibited the progression of early-stage arthritis in this model. Herein, statistical analysis was performed using SPSS software (IBM Corp., Armonk, NY), with significance assessed by one-way ANOVA. In conclusion, Rebastinib encapsulated in pH-dependent liposomes holds promise as a potential therapeutic strategy for treating early arthritis, offering both stability and efficacy in disease suppression.

OR-8

Cadaveric study of pressure mapping in small dogs : assessing lateral fabello-tibial suture technique with an assistant device for cranial cruciate ligament rupture

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Abstract: Lateral fabello-tibial suture (LFTS) technique is an effective surgical option for small dogs suffering from cranial cruciate ligament (CCL) injuries. However, achieving precise, quantitative application during surgery remains challenging due to difficulties in standardizing the tension on the suture. The effect of stifle joint angle during tensioning has been suggested by previous studies. This study aims to explore quantitative tension applications in LFTS technique at specific stifle joint angles and to assess the postoperative outcomes of LFTS technique using pressure mapping measurements. Twelve hindlimbs of six small breed cadaveric dogs were prepared. Each hindlimb was evaluated under five experimental conditions: Intact, CCL rupture, L90 (LFTS at a stifle joint angle of 90 degrees), L105, and L130. A tensioner equipped with a three-dimensional printed tension assistant device (3DTAD) was utilized to standardize the application of tension across all surgical procedures. Tensioning was terminated based on the tibial compression and the resistance applied to the tensioner, with the tension values measured using a tensiometer. Using a force-sensitive resistor and pressure-sensitive film, digit pad pressure, tibial rotation, patellar joint pressure, and tibiofemoral pressure distribution were assessed. As a result, statistically significant tension values of 80 N in the L90, 87.5 N in the L105, and 99.17 N in the L130 were obtained. This study provides quantitative tension values at stifle angles of 90, 105, and 130 degrees in LFTS technique, aided by the tensioner and the 3DTAD accordingly. Additionally, a stifle angle of 105 degrees resulted in near-intact pressures across these parameters.

OR-9

The Use of Calcium Sulfate Antibiotic Beads and BMP-2 mixed with HA/Allograft treated both of Osteomyelitis and Nonunion in Dog

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Abstract: A 6-year-old, 35kg male German shepherd dog presented with a comminuted fracture of the left tibia due to a fall. The patient was treated with plate-rod stabilization and external skeletal fixation. The first surgery resulted in an external torsion in the patient's left hindlimb. Therefore, an additional deformity correction surgery was performed based on the measurement of the tibial torsion angle. During the healing period, a surgical site infection (SSI) due to MRSA was detected by an antimicrobial susceptibility test and hindered the bone healing process. In order to address osteomyelitis and nonunion, calcium sulfate antibiotic beads, antibiotic impregnated collagen sponge, Hydroxyapatite(HA)/Allograft loaded with BMP-2 were grafted to resolve the SSI and promote bone healing. Six weeks after the application of antibiotic beads and bone graft materials, the fracture line disappeared and bone union was observed. Complete bone healing was confirmed via radiographic imaging, and functional recovery was verified through objective gait analysis. The gait analysis data were statistically analyzed using Repeated measures ANOVA (GraphPad Prism software 10). Subsequently, the implant was removed to prevent stress protection osteopenia. In this case, the restrictions related to systemic antibiotic use were overcome using local antibiotic beads to treat osteomyelitis-induced nonunion. Additionally, the tibia, which was at risk for nonunion, healed more effectively with the use of bone graft materials loaded with BMP-2. Consequently, a tissue engineering strategy using calcium sulfate antibiotic beads and BMP-2 loaded bone graft substitutes can be an alternative for treating osteomyelitis in bones at high risk for nonunion.

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OR-10

Caudal lateral approach for the total ear canal ablation and lateral bulla osteotomy in two French bull dogs.

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Abstract: Total ear canal ablation with lateral bulla osteotomy (TECA-LBO) is technically challenging due to the anatomic complexity of the region, especially in brachycephalic breeds (BBs). Computed tomographic conformational studies carried out in BBs have demonstrated differences in the anatomy of the tympanic bulla, including bulla volume and position in relation to the temporomandibular joint, compared with all other breeds. A past study showed intraoperative complication rates following TECA-LBO in BBs (11.1%) was more frequent than in other breeds (5.3%). These malformations make it difficult to perform TECA-LBO with the conventional lateral approach, so an alternative procedure or approach should be considered. In this case report, two French bulldogs with end-stage otitis externa were referred to the Isesaki Animal Medical Center. Preoperative computed tomography was performed, and the anatomical relationship of the external ear canal, the inlet of the tympanic bulla, and the tympanic bulla was evaluated. From these findings, the caudal lateral approach was considered advantageous for observing the tympanic bulla without obstruction from the temporomandibular joint and zygomatic bone. TECA-LBO with a caudal lateral approach was performed on these 2 cases without any complications, such as hemorrhaging, facial nerve paresis, Horner's syndrome, or incisional dehiscence. To the author's knowledge, there have been no prior reports considering the surgical approach angle for TECA-LBO in BBs.

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OR-11

Postoperative sliding hiatal hernia in cats following diaphragmatic hernia repair: proposing a left gastropexy as a preventative strategy

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Abstract: Sliding hiatal hernia has been reported as a post-operative complication from diaphragmatic hernia repair in dogs, it has not been well-documented in cats. Similar to humans, factors such as dyspnea, increased intra-abdominal pressure, and loosening of the phrenoesophageal membrane were associated with its development; however, the exact cause remains unclear. Retrospective data of cats that underwent diaphragmatic hernia repair at the Surgery unit, Small Animal Teaching Hospital, Chulalongkorn University, Thailand, from January 2018 to December 2020 were collected. A total of 51 cats were included, 3/51 (5.9%) developed hiatal hernia; diagnosed by either radiography, endoscopy, or both. All 3 cats received a second surgery and the hiatal hernia was confirmed intraoperatively. Two cats survived following hiatal hernia correction, while one cat died on the first postoperative day. Despite its relatively low prevalence, post-operative sliding hiatal hernia can be life-threatening, and requiring urgent surgical intervention. To prevent this risk, we proposed incorporating a left gastropexy during diaphragmatic repair as a preventive measure. From 2021-present, 36/88 (40.9%) cats underwent prophylactic left-sided gastropexy during diaphragmatic repair, and none of these cats showed postoperative clinical signs, no radiographic evidence of hiatal hernia nor complications after discharge. Cats that did not receive the prophylactic gastropexy developed hiatal hernia 2/52 (3.8%) postoperatively. These findings suggested adding left gastropexy as a quick and effective strategy to reduce the risk of postoperative hiatal hernia in cats.

OR-12

Surgical outcome of hepatic mass originated from papillary process of caudate lobe in dogs

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Abstract: Surgery is the treatment of choice for solitary primary hepatic masses in dogs. However, surgical resection of hepatic masses originated from the papillary process of caudate lobe is considered difficult due to the anatomical location. Therefore, this study aimed to evaluate the surgical outcome of hepatic mass originated from the papillary process in dogs. Dogs underwent surgical resection of a hepatic mass originated from the papillary process were included: however, the cases with multiple hepatic lobectomies were excluded when the primary site of hepatic masses was other than the papillary process. Intraoperative findings, histopathologic examination findings, and postoperative prognosis were reviewed from the medical records in all dogs. Of the 29 dogs underwent the hepatectomy of the caudate papillary process, 22 were included in this study. The histopathologic diagnosis was hepatocellular carcinoma (HCC) in 16 dogs, hemangiosarcoma in 2 dogs, and hepatocholangiocarcinoma, focal nodular hyperplasia, hematoma, chronic suppurative cholangitis with glycogen accumulation in 1 dog each. Of the 16 dogs with HCC, 12 had the complete resection: however, tumor infiltration was observed in the resection margins in the remaining 4 dogs. The median total operative time was 85 min [range: 55-172 min]. The median hospitalization period was 6 days [range: 0-23 days]. The short-term mortality rate was 9 % (2 dogs), whereas the 20 dogs survived over 14 days postoperatively. This study suggests that surgical resection of hepatic mass originated from the papillary process of caudate lobe is feasible and effective in dogs similar to the other hepatic lobectomies.

OR-13

The clinical outcomes of perineal herniorrhaphy in conjunction with prostate disease management and castration: retrospective study

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Abstract: In this retrospective study, the objective was to evaluate the clinical outcomes and recurrence following perineal herniorrhaphy with castration and the management of prostatic diseases. 315 male dogs with PH and concurrent prostatic disorders were categorized into 2 groups: 184 of castrated (PHC), and 131 of non-castrated (PNHC) group. The most common presenting signs were perineal swelling, dyschezia, tenesmus, and stranguria/ dysuria. Prostatic hyperplasia occurred in 55.25% (100/181) of the PHC group and 19.23% (25/130) of the PHNC group. Heterogeneous echogenicity of the prostate was observed in 77.35% (140/181) of the PHC group and 84.62% (110/130) of the PHNC group. Prostatic cystic lesions were found in 81.22% (147/181) of the PHC group and 88.46% (115/130) of the PHNC group. Fine needle aspiration (FNA) of prostatic fluid, as well as partial and total prostatectomy with omentalization were performed. The most frequently herniated contents in both groups were the prostate gland and UB. After surgery, the clinical signs significantly improved in both short-term (1-2 months) and long-term phases (> 6 months) in the PHC groups ($p < 0.001$). In the long-term follow-up, the recurrent PH rate had not significantly differentiated between the groups ($p = 0.48$). In conclusion, castration combined with perineal herniorrhaphy effectively treats perineal hernias in dogs concurrent with prostatic disorders and has fewer complications.

OR-14

Outcomes of extravesicular, single-layer, side-to-side ureteroneocystostomy without temporary ureteral catheter in 15 cats with ureteral obstruction

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Abstract: Ureteral obstruction is a condition caused by uroliths, strictures, or neoplasia. In this study, medical records of cats with ureteral obstruction that underwent extravesicular, single-layer, side-to-side ureteroneocystostomy without temporary ureteral catheter between 2023 and 2024 were reviewed. The study included 15 cats (17 kidneys and ureters) diagnosed with ureteral obstruction based on ultrasound and CT scan. 14 cats were obstructed by calcium oxalate and one cat by proteinaceous calculi. The median age was 4 years old, and the median body weight was 3.34 kg. The overall median surgical time was 149 minutes, and the median hospitalization duration was 7 days. All cats showed decreased postoperative blood urea nitrogen and creatinine concentrations compared to preoperative levels. Postoperative urethral catheterization was performed in 10 cats, and postobstructive diuresis was observed in all cats. The median preoperative renal pelvis diameter (RPD) in the affected kidney was 7 mm. The median postoperative RPD at discharge and at the initial follow-up visit were 3.2 mm and 1.1 mm respectively. The perioperative mortality rate was 0%. Short-term postoperative complications included urinary tract infection (2), transient urine leakage from nephrostomy tube removal site (1), hemorrhage requiring blood transfusion (1), and temporary ureteral obstructions by uroliths (2), pyelonephritis debris (1), and blood clot (1). All short-term complications were successfully resolved. None of the patients developed stenosis at the anastomosis site during the short-term postoperative period. Single-layer ureteroneocystostomy without a ureteral catheter is a viable surgical option for the treatment of feline ureteral obstruction.

OR-15

Upregulation of klotho-beta expression in canine transitional cell carcinoma and its prognostic significance

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Abstract: Several studies have revealed that klotho-beta (KLB), a key regulator of fibroblast growth factor receptor pathway, is correlated with tumorigenesis and tumor progression. Additionally, elevated urine KLB level is shown to be associated with shorter progression-free survival for bladder cancer. However, such an association has not been investigated in veterinary medicine. Therefore, this study aims to evaluate the KLB expression in canine urinary bladder (UB) tissue and the urine KLB concentration, along with its correlation with clinicopathological factors. 38 canine UB tissues, including six normal tissues, 17 benign urinary bladder disease (UBD) tissues, and 13 transitional cell carcinoma (TCC) tissues were examined to evaluate KLB expression by immunohistochemistry. UBD and TCC samples were collected from dogs that underwent surgery between July 2013 and July 2023 at Seoul National University Veterinary Medical Teaching Hospital. Voided urine samples were collected from 28 dogs, including six healthy dogs and 22 TCC patients, for KLB quantitation with enzyme-linked immunosorbent assay. KLB expression was significantly higher in TCC tissues than in normal and benign UBD tissues. Urine KLB concentration in TCC dogs (1963.1 [1820.3-2161.0] ng/L; median [95% confidence interval]) was significantly higher than in healthy controls (1327.4 [1116.8-1609.6] ng/L). Kaplan-Meier survival analysis showed that high KLB expression in UB tissues was correlated with poor disease-free survival and overall survival, and high urine KLB concentration was significantly associated with shorter overall survival. These findings suggest that KLB upregulation is associated with poor prognosis, making it a potential diagnostic biomarker and therapeutic target for canine TCC.

OR-16

Successful salvage from ventricular fibrillation during thoracoscopic pericardiectomy in 2 dogs

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Abstract: One of major complications with pericardiectomy is ventricular fibrillation (VF), which is a serious life-threatening condition, so high mortality rate has been reported when VF has occurred. This case report aimed to describe the successful salvage from ventricular fibrillation (VF) suddenly occurred during the thoracoscopic pericardiectomy in dogs. Two shibas (cases #1 and 2) were referred to our hospital due to an idiopathic chylothorax. The patients underwent a triple combination endoscopic surgery with thoracic duct clipping (TDC), cisterna chyli ablation (CCA) and partial pericardiectomy (PPC). The TDC and CCA were finished in each patient positioned on the ventral recumbency, and PPC was then carried out after the positional change to the dorsal recumbency. The VF occurred during thoracoscopic PPC using the vessel sealing system. Immediately after the identification of VF, a right intercostal thoracotomy was converted without the positional changes and resuscitated with direct cardiac massage while the defibrillation was performed. The VF was resolved after the resuscitation in both patients, and the PPC was completed via the intercostal incision under the thoracoscopic assistance. The duration of VF was approximately 4 min in case #1 and 4 min and 30 sec in case #2. Both patients recovered well from the anesthesia without any of major complications. This case report demonstrated the successful salvage from sudden VF during thoracoscopic PPC with conversion to intercostal thoracotomy. The preparation of a defibrillator with a sterile paddle in the operation room is suggested to be required when performing thoracoscopic PPC.

OR-17

Utilizing the VetEase device: novel cryoanesthesia in 90 cases of dogs as a pain management tool

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Abstract: Effective pain management is vital in veterinary practice, but traditional methods like lidocaine and cooling sprays have limitations. This study evaluates the efficacy of a novel cryotherapy device (VetEase, Recensemedical, Hwaseong-si, Republic of Korea), in managing pain during invasive procedures.

A total of 90 cases from 54 client-owned dogs underwent three invasive procedures (centesis, FNA, and jugular venipuncture) with VetEase applied before treatment. Procedures were divided into three groups: control (no spray), Group A (sprayed for 2 seconds at 2°C), and Group B (sprayed for 5 seconds at 2°C). Dogs scoring >6/24 on the Short Form Glasgow Composite Pain Scale or with a history of sedative or analgesic use were excluded. Pain scores (PS) and visual analog scale (VAS) were recorded immediately after needle insertion, assessing reactions such as vocalization, head turning, body movements, and eye movements.

In centesis procedures, both Group A and Group B showed a significant reduction in PS and VAS compared to the control group ($p=0.007$, $p<0.001$). For FNA, Group B demonstrated statistical significance in VAS ($p=0.93$) but not in PS ($p=0.03$). No statistical significance was observed in jugular venipuncture for either group. Overall, Group B showed reduced PS and VAS across all procedures compared to the control group. No skin complications were observed in either Group A or Group B.

VetEase cryoanesthesia effectively reduces needle-induced pain and provides immediate local anesthesia without delays or skin complications, making it a promising alternative to topical anesthetics. Further research is needed to determine optimal use.

Sponsorship: No corporate sponsorship to declare.

OR-18

Is alfaxalone truly equivalent to propofol? A functional MRI study.

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Abstract: Alfaxalone has been reported to have the similar effects with propofol but also reported to have a higher incidence of paddling and trembling during recovery. Where does this difference come from? We compared the effects of alfaxalone and propofol on brain function using functional MRI (fMRI), which can assess neural activity. Four common marmosets were used in the study. FMRI was performed in awake state and under anesthesia either propofol or alfaxalone. For both anesthetics tracheal intubation was maintained at the lowest acceptable dose. 60-minutes fMRI data were collected using a 9.4 T-MRI system. Gray matter regions were divided into 52 hemispheric regions, and timeseries data were calculated for each region from the fMRI data. From the timeseries data, partial correlation coefficients between regions were calculated to assess functional connectivity. In the awake state, functional connectivity was formed among many regions, indicating that brain function is maintained by the coordination of these regions. Propofol anesthesia,reduced several connectivity, particulary in the thalamus, which is considered a target region of anesthetics, but connectivity was maintained in many regions. In addition to the connectivity lost with propofol, alfaxalone reduced connectivity in motor, somatosensory, and auditory cortices, indicating that alfaxalone suppressed activity in more regions than propofol. Functional inhibition in motor and somatosensory cortices may be involved in the development of paddling and trembling. Clarification of the differences between these two agents would be helpful in determining the best use of the agents and in accurately assessing the status of patients under anesthesia.

Three Cases of Atrial Septal Defect (ASD) Treated with the Amplatzer Canine Duct Occluder

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Abstract:

We performed the first treatment of atrial septal defect (ASD) in small dogs using the Amplatz Duct Occluder in 2016. Since then, we have successfully treated a total of three cases. A key factor in these treatments is the selection of the appropriate device size. Through the experience of these three cases, we have gained some insights into device size selection, which I will present here.

Case 1: A Norfolk Terrier weighing 6.9 kg presented asymptomatically, but an ASD was incidentally discovered during an examination, leading to a referral to our hospital. The diagnosis of ASD was confirmed through echocardiography and electrocardiogram-gated CT, followed by precise size measurements. A left-sided thoracotomy was performed at the 5th intercostal space, and a 14 mm Amplatz Canine Duct Occluder (ACDO) was placed under transesophageal echocardiography guidance. The postoperative recovery was smooth, and eight years later, the patient remains healthy without any complications.

Case 2: A Yorkshire Terrier weighing 2.42 kg. An incidental ASD was discovered via echocardiography. Both echocardiography and electrocardiogram-gated CT were used to diagnose and measure the size of the ASD. Through a left fourth intercostal approach, a 9 mm diameter ACDO was successfully deployed. The post-operative course has been smooth, and the patient is currently doing well.

Case 3: A 7-month-old female Toy Poodle weighing 3.67 kg. An ASD was discovered during a preoperative exam for spaying. Both echocardiography and electrocardiogram-gated CT were used to diagnose and measure the size of the ASD. A 12 mm ACDO was used to close the ASD. The post-operative course has been smooth, and the patient is doing well.

The hybrid approach for ASD closure with ACDO has proven to be highly effective, with long-term follow-up cases showing favorable outcomes. The ACDO is expensive, and it is difficult to have various sizes readily available in advance. Therefore, it is desirable to determine the appropriate size as early as possible before the procedure. In these cases, the diameter was measured using echocardiography, electrocardiogram-gated CT, and intraoperative transesophageal echocardiography (TEE). It is worth discussing how the size was determined based on these measurements.

This study was not supported by any grants.

OR-20

Preoperative prediction models for 30-day mortality after mitral valve repair in dogs

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Abstract: Mitral valve repair (MVR) has emerged as a novel surgical intervention for dogs with myxomatous mitral valve disease (MMVD), yet objective risk assessment methods are lacking.

This single-center retrospective cohort study aimed to develop preoperative prediction models for 30-day postoperative mortality in dogs undergoing MVR and evaluate their association with long-term mortality. A total of 2091 client-owned dogs that underwent MVR between 2016 and 2023 were included. Preoperative variables, including demographic data, routine blood and image examination data, and medication histories were selected as predictor candidates. The primary and secondary outcomes were 30-day and 2-year all-cause death after MVR, respectively. Using preoperative variables and lasso and ridge estimation methods, prediction models for 30-day all-cause death were developed, and these model's performances were evaluated. The association between predicted probabilities and 2-year cumulative all-cause mortality was assessed using Cox proportional hazards analysis. All data handling and statistical analyses were performed using R ver. 4.2.3 (Vienna, Austria). The all-cause mortality at 30 days after MVR was 4.9% (102/2091). In internal validation, preoperative prediction models for 30-days all-cause death demonstrated moderate discrimination abilities (c-statistics, 0.655) and good calibration performances (slope, 1.067; intercept, 0.01; Eavg, 0.002). Quartiles of predicted 30-day mortality risk were associated with 2-year mortality (hazard ratio for 4th vs. 1st quartile: 2.32, 95% confidence interval: 1.43–3.76). The proposed prediction model may provide useful preoperative risk assessment of MVR in dogs with MMVD.

Sponsorship: None.

Concurrent Lobectomy and Mitral Valve Repair in Two Dogs

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Abstract: Mitral valve repair (MVR) effectively improves the prognosis of dogs with mitral valve regurgitation. Depending on the complications, other surgical treatments may be required simultaneously with MVR. If a lobectomy is recommended, either MVR or a lobectomy can cause adhesions, making it difficult to perform other surgical treatments afterward. In this study, we performed MVR after a lobectomy in two dogs. Case 1 was a Shih Tzu female, aged 12 years and 9 months. She had developed congestive left-sided heart failure and was scheduled for MVR. A pulmonary bulla was found in the posterior lobe of the left lung, which was resected using linear stapling devices and hemostatic vascular clips, and MVR was performed. The surgery was successful, and the patient was discharged after 17 days. Case 2 involved a Maltese female, aged 11 years and 5 months. A mass was found in the left posterior lobe of the lung, and a lobectomy was performed using a linear stapling device; then, MVR was performed. The surgery was successful, and the patient was discharged after five days. MVR is performed through a left 4th and 5th intercostal thoracotomy. MVR and a lobectomy can be performed without any complications as long as bleeding can be confirmed visually. The advantage of this approach is that highly invasive surgery can be completed using a single procedure. However, the area of the lung that can be operated on simultaneously is limited.

OR-22

Complete Resolution of Mitral Regurgitation in 3 Cases of MMVD Stage B2 and C After TEER Surgery

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Abstract: Transcatheter Edge-to-Edge Repair (TEER) represents a minimally invasive hybrid cardiac surgery without cardiac arrest, applicable to patients with Myxomatous Mitral Valve Disease (MMVD). V-clamp® was inserted in left atrium with 24Fr catheter by transapical approach, and located and fixed center of anterior leaflet and posterior leaflet in 4-dimensional transesophageal echocardiography view. D TEER was performed in 3 dogs of MMVD stage B2 and C. The median body weight was 5.06(2.2 -7) kg, and median age was 10.6(10-11) years. A mean follow-up periods are 13(10-15) months. All 3 patients regained consciousness within one hour post-surgery and were discharged within four days. While mild Mitral Regurgitation (MR) persisted immediately after the procedure, follow-up at 12 weeks showed a remarkable reduction, with MR nearly undetectable compared to postoperative levels. Diuretics were discontinued immediately after the surgery, and pimobendan has been administered for 3 to 6 months before cessation. Similar to TEER surgery in human medicine, we hypothesize that fibrous tissue develops over the device in mitral valve within one to three months post-surgery, contributing to the observed outcomes. This study confirms that TEER surgery is a beneficial option for patients with MMVD stage B2 and C, leading to significant improvements in MR management.

OR-23

Outcomes of transcatheter edge to edge repair surgery to manage myxomatous mitral valve disease stage D in 5 dogs.

Kyoung-a Youp[1], Suntae Lee[1], Ahra Lee[1*]

[1)]Korea Animal Medical Center, Cheongju, Republic of Korea

Abstract: Transcatheter edge-to-edge repair (TEER) is a hybrid surgery that involves inserting a catheter from the apex without stopping the heart to attach a clamp, representing a minimally invasive procedure in cardiac surgery. TEER was performed in 5 dogs of myxomatous mitral valve disease (MMVD) stage D. The median body weight was 3.11 kg, and median age was 10.5 years. A mean follow-up periods are 24 weeks (10-50). 2/5 dogs had hyperadrenalcorticism, 2/5 dogs had pulmonary hypertension, and 1/5 dog had menigoencephalomyelitis. Severe flail of the anterior or posterior leaflet due to chordae tendinae rupture was confirmed in 4/5 dogs, moderate prolapse of leaflet was found in one dog. Tethering of leaflet was confirmed in 2/5 dogs. One of the patients had been managed for over 2 years, with a gradual progression to MMVD stage D, 9 times hospitalization due to pulmonary edema, while the other four patients rapidly progressed to stage D within 1 week to 4 months after the first occurrence of pulmonary edema. The operation time ranged from 60-120 minutes from thoracotomy to closure of skin, with catheter insertion time in the heart lasting 15-30 minutes. All five dogs recovered well after the surgery, their mental status was recovered in an hour. They have been surviving for 3-11 months so far, showing a good quality of life. In this case report, TEER was performed to five mmvd stage D patients with severely impaired myocardial contractility and refractory pulmonary edema, demonstrating favorable outcomes.

OR-24

Laparoscopic partial pancreatectomy with lymphadenectomy in dogs: a case series report

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Abstract: Laparoscopic partial pancreatectomy for treatment of B-cell tumors in dogs is well described in veterinary literature but to our knowledge concurrent lymphadenectomy has not been reported. Three client owned dogs underwent left sided laparoscopic partial pancreatectomy with pancreatic lymph nodes lymphadenectomy between 2022 and 2023. In all three cases 4-port technique with additional transcutaneous stomach stay sutures was used. Partial pancreatectomy and pancreatic lymph nodes removal was performed with the Ligasure. The procedure was performed successfully, with no conversion to open laparotomy, in all cases with a mean surgery time of 88 min. Left gastric artery was damaged during dissection of a lymph node with following ligation in one case. Two dogs become normoglycemic immediately after surgery, one dog experienced hypoglycemia for two days after surgery, which then turned to hyperglycemia requiring insulin use. Postoperative complications including mild pancreatitis occurred in two dogs, and resolved with medical treatments. Mild to moderate pain with no need of opioids use was observed in all three cases. All dogs survived the surgical procedure and were discharged from the clinic between 2 and 5 days after surgery. According to histopathological reports insulinoma with metastatic lesion of the lymp node was confirmed in all three cases regarded as stage 2 of the disease due to the absence of distant metastases at the time of diagnosis. Our results suggested that laparoscopic partial pancreatectomy with lymphadenectomy could be considered as a feasible safe treatment option for stage two insulinoma in dogs

OR-25

Efficacy of 3D laparoscopy combined with articulating instruments for intracorporeal suturing in veterinary surgery

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Abstract: This study evaluates the effectiveness of 3D laparoscopy compared to 2D laparoscopy in improving depth perception, accuracy, and efficiency during intracorporeal suturing using articulating instruments. The study involved two phases where Artisential® (Livsmed, Seongnam, South Korea) were applied. The experimental phase compared a 10mm 3D laparoscope and a 5mm 2D laparoscope in PEG transfer and intracorporeal suturing tasks in a laparoscopic box. Depth perception, accuracy, and task completion time were measured, with tasks repeated five times per system. The clinical phase included cases that required intracorporeal suturing, such as diaphragmatic hernia, peritoneopericardial diaphragmatic hernia (PPDH), and inguinal hernia repairs in small dogs and cats. Surgical precision, efficiency, and the challenges of performing these procedures in smaller patients were assessed. In the experimental phase, the 3D system demonstrated superior depth perception and suturing accuracy, reducing task completion time. In the clinical phase, the 3D system also improved precision and reduced fatigue during intracorporeal suturing procedures. However, the larger scope and restricted field of view posed challenges in smaller patients, particularly in toy breed dogs, where visualization and maneuverability were more constrained. Both systems improved articulation, but the 3D laparoscope enhanced depth perception, accuracy, and efficiency during intracorporeal suturing. Despite limitations with smaller patients, 3D laparoscopy has significant potential for improving outcomes in veterinary surgeries. Further studies with larger sample sizes are recommended. This study marks the first report in veterinary medicine combining 3D laparoscopy with articulating instruments, demonstrating its potential to improve surgical outcomes in complex procedures involving intracorporeal suturing.

OR-26

Managing Hypercapnia in Large Breed Dogs During Abdominal Laparoscopic Surgery: Determining Optimal Ventilatory Driving Pressure—Preliminary Results Of A Prospective Clinical Study

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Abstract:

We determined the driving pressure (ΔP = plateau pressure – positive end-expiratory pressure [PEEP]) to maintain normocapnia during 8-10 mmHg pneumoperitoneum from elective laparoscopic procedures in large breed dogs. Arterial blood gas, ventilatory and cardiopulmonary data were collected from seven sevoflurane-anesthetized dogs (56.7 ± 11.8 kg) under spontaneous ventilation at baseline (SV-baseline) and 15 minutes after abdominal insufflation (SV-15). Pressure-controlled ventilation was then started with 20 breaths min^{-1}, 1:2 inspiratory:expiratory ratio, 5 cmH_2O PEEP, and initial peak inspiratory pressure (PIP) of 12 cmH_2O (ΔP: 7 cmH_2O), which was increased every 5 minutes by 2 cmH_2O until reaching an end-tidal CO_2 ($ETCO_2$) of 35-40 mmHg or PIP >20 cmH_2O. Data were collected after 45 minutes of abdominal insufflation (MV-45; 30 min under MV), 5 minutes post-deflation (MV-deflated), and after initial ΔP was reset at the end of surgery (MV-end). ANOVA with Bonferroni *post hoc* and Friedman test with Dunn's *post hoc* were used ($p < 0.05$). Abdominal insufflation maintained low expired tidal volume (VTexp) and worsened hypercapnia ($p = 0.0053$). These were corrected by mechanical ventilation with ΔP 13 ± 2 cmH_2O (Pplat 17.4 ± 2.2 cmH_2O; $p < 0.001$). After abdominal deflation, this ΔP led to VTexp and $PaCO_2$ improvement. Returning to initial ΔP led to less hypercapnia than SV-baseline. Other variables were adequate, except for a dog requiring dobutamine for hypotension started before surgery. ΔP 13 ± 2 cmH_2O with 5 cmH_2O PEEP maintained normocapnia with and without 8-10 mmHg pneumoperitoneum without significant cardiopulmonary effects in large dogs.

This study was supported by the GINN (#02-511087-40007) and Minnie Bell Heep grants. Animal Use Protocol #2023-0209 approved by Texas A&M Institutional Animal Care and Use Committee.

OR-27

A Comparison of Non-elective and Elective Laparoscopic Cholecystectomy Outcomes in Dogs with Gallbladder Disease

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Objective: In a retrospective cohort study, compare the outcomes and data of elective and non-elective laparoscopic cholecystectomy (LC) in dogs.

Methods: From 2018 to 2024, 126 canines that underwent LC for biliary tract disease were analyzed in a consecution case study. Medical records and data of the dogs obtained were reviewed. The fundus dissection first method was used for LC. Intraoperative cholangiography and bile duct flush procedures were performed laparoscopically using a catheter inserted into the cystic duct. Extrahepatic biliary obstruction was treated laparoscopically. The dogs were divided into two groups based on whether the cholecystectomy was elective (dogs with no or moderate clinical indications and no indication of biliary obstruction) or nonelective (dogs with icterus and doubtful biliary patency). The two groups were compared for mortality, complications, conversion to open surgery, and operating time.

Result: 94 (74.6%) dogs were included in the elective group and 32 (25.4%) in the nonelective group. Mortality was 2.6% (2/75) in electives, 3.1% (1/32) in non-electives, and 2.4% overall.

The complication rate was 6.2% (3/75) in electives, 0% (0/32) in non-electives, and 1.6% overall.

The conversion rate was 2.6% (0/75) in electives, 9.3% (3/32) in non-electives, and 2.4% overall.

Median surgery time was 112 min in electives, 148min in non-electives, and 130 min overall.

Conclusion: The mortality and complication rates in dogs who underwent LC, whether it was an elective or non-elective surgery, were considerably lower than what has been previously reported. LC may give favorable outcomes when performed using a standardized approach.

OR-28

Laparoscopic Ligation of Feeding Arteries for Unresectable Liver Tumors: A Minimally Invasive Therapeutic and Diagnostic Approach

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Korea Animal Medical Center, Cheongju, South Korea[1]

Abstract: Feeding artery embolization is widely recognized as an effective treatment for unresectable liver tumors, but it poses risks such as gallbladder necrosis due to blockage of non-target vessels. Laparoscopy, compared to percutaneous biopsy methods, offers high-quality biopsy samples with better accuracy in a minimally invasive manner, though it carries a risk of bleeding. A combined approach of minimally invasive diagnosis and treatment could provide an optimal solution. However, no reports on this specific method currently exist.

In three cases of unresectable or high-risk liver masses, laparoscopic ligation of the feeding artery was performed. Patients exhibited symptoms such as regurgitation due to stomach/esophageal displacement and hemoabdomen from tumor bleeding. CT angiography identified the feeding artery supplying the mass, and laparoscopic clips were used to ligate the artery. Pulsation ceased, and biopsies were taken without bleeding complications. Postoperative systemic inflammation occurred but resolved within a week. Follow-up after 1 to 2 months showed tumor size either decreased or remained stable, with no recurrence of preoperative symptoms.

Laparoscopic ligation of the feeding artery, with a comprehensive understanding of tumor and arterial anatomy, offers a promising palliative treatment for unresectable liver tumors. It also allows for safe, simultaneous biopsy, enhancing clinical utility.

This study received no financial support

OR-29

Indocyanine green near-infrared fluorescence guided sentinel lymph node biopsy for canine mammary tumor patients: feasibility and optimization

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Abstract: This study aimed to assess the use of indocyanine green near-infrared fluorescence (ICG-NIRF) imaging for sentinel lymph node (SLN) biopsies in canine mammary tumors (CMT), with a focus on determining the optimal ICG concentration for accurate identification of lymphatic drainage and SLNs. The researchers proposed that ICG-NIRF could improve the precision of SLN biopsies in CMT. Methods involved 24 female dogs with malignant CMTs confirmed through cytology. Peritumoral injections of ICG at concentrations of 0.5, 1.0, and 2.5 mg/mL were administered, and near-infrared imaging was used intraoperatively to visualize lymphatic flow and identify SLNs. Statistical analyses were conducted using SPSS (IBM SPSS Statistics V28.0, IBM Corp., Armonk, NY, USA), with one-way ANOVA and Tukey's post-hoc tests used to assess the differences in fluorescence intensity and operative time among the ICG groups. The study successfully detected SLNs in 94.4% (34/36) of cases using ICG-NIRF imaging. Among the tested concentrations, 1.0 mg/mL provided the highest fluorescence intensity in lymph nodes ($p=0.030$) and resulted in the shortest operation duration ($p=0.002$). Minimal false negatives were observed, and no notable complications occurred during or after surgery. In conclusion, ICG-NIRF proved to be an effective technique for SLN mapping in CMT. The 1.0 mg/mL ICG concentration offered the best visualization and efficiency, significantly improving the accuracy of SLN biopsies and surgical outcomes.

This study was supported by "Leaders in Industry-university Cooperation 3.0" Project by the Ministry of Education and National Research Foundation of Korea, and also supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT) (RS-2023-00253736)

OR-30

Prognostic impact of immune cell infiltration in canine oral malignant melanoma treated with anti-PD-L1 antibody therapy

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4) *Laboratory of Veterinary Pathology, Department of Veterinary Medicine, Azabu University, Sagamihara, Kanagawa, Japan.*

Abstract: Immune checkpoint inhibitors (ICIs) have recently emerged as a promising therapeutic approach for treating stage IV canine oral malignant melanoma (OMM). However, despite their potential, only about 15% of cases respond to anti-PD-L1 therapy. In human medicine, it is well documented that immune cell infiltration into the tumor microenvironment is associated with prognosis and serves as a potential biomarker for predicting ICIs response. The purpose of this study was to evaluate the relationship between immune cell infiltration and survival time in dogs with stage IV OMM treated with anti-PD-L1 antibody therapy, and to determine whether immune cell infiltration could serve as a predictive biomarker for survival outcomes. Stage IV OMM cases treated with anti-PD-L1 antibody therapy were included in this study. Immunohistochemistry was performed to detect CD3, Granzyme B, and FOXP3 positive cells on pre-treatment pathological tissues. Ten fields (×200 magnification) were randomly selected, and these cells were digitally counted. The correlation between these data and survival time was analyzed. A total of 15 samples were analyzed. Higher infiltration of CD3 and Granzyme B positive cells was significantly associated with prolonged survival, whereas no such association was observed for FOXP3 positive cells. Additionally, the number of CD3 and Granzyme B positive cells was significantly correlated. Our results suggest that tumor-infiltrating lymphocytes (TILs) play a crucial role in the prognosis of ICIs in dogs and could be potential predictors for therapeutic outcomes. Further studies incorporating comprehensive immune profiling are warranted.

OR-31

Feasibility of Endo GIA™ stapler for lung lobectomy via lateral thoracotomy in cats

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Abstract:

Lung lobectomy using stapling devices can be performed as a less invasive procedure. Thoracoabdominal stapler seemed unsuitable for small thoracic patients. On the other hand, the use of a gastrointestinal anastomosis (GIA) stapler in thoracoscopically assisted surgery has been reported in only a few cats. This study retrospectively reviewed medical records at Japan Small Animal Medical Center between April 2019 and August 2024 and investigated the feasibility of the GIA stapler (Endo GIA™ Tri-Staple™ vascular/medium: Medtronic, Minneapolis, Minnesota) for lung lobectomy via lateral thoracotomy in cats. Thirteen cats (median age: 10.8 years [range, 3.4-15.7], median weight: 5.3 kg [3.7- 11.1]) were included. Fifteen complete lung lobectomies in 12 cats and one partial lobectomy in a cat were performed. The median distance between the resected bronchi and the lesion, measured on three-dimensional multiplanar reconstruction computed tomography images, was 22.5 mm (range, 6.8-55.2). The median operative time including concurrent procedures, was 70 min (range, 52-128). In three cats, mean arterial pressure dropped below 60 mmHg intraoperatively. There were two moderate respiratory complications (pneumothorax without clinical signs [1], cough [1]) in the postoperative period, which were managed conservatively. No patients required revision surgery, and all cats were discharged and alive at least 2 weeks after surgery. The operative time and perioperative complication rates in our study were almost similar to those in previous reports undergoing thoracoscopic lung lobectomy in dogs. Therefore, the use of the Endo GIA stapler might be a feasible option for lung lobectomy via lateral thoracotomy in cats.

Poster Presentation

Conference Room 207, Sapporo Convention Center 2F

Poster Core Time

2024 December 21

11:05 - 11:55

PO-1

Feasibility of integrating locking plate system into additively manufactured implants: A mechanical comparison of 3D-printed and machined locking hole threads

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Abstract: This study aimed to integrate locking plate system into 3D-printed implants and evaluate whether directly 3D-printed locking plate holes could achieve mechanical performance comparable to machined counterpart. The effects of varying screw insertion torque, insertion angle, and build orientation on this performance were also investigated. In vitro mechanical tests were performed to compare the 3D-printed 3.5 mm locking plate system with the commercially available variable-angle locking system (ARIX). Locking plate specimens (n = 90) were 3D printed from Ti6Al4V in three build orientations (0°, 45°, and 90°). A torque limit test assessed the failure points under three screw insertion torques (0.6, 1.1, and 2.0 Nm) at two angles (0° and 15°). The locked screw and plate constructs then underwent push-out testing, with a load applied parallel to the screw axis. At 2.0 Nm, all 3D-printed specimens failed due to thread deformation, whereas the ARIX system remained intact. Specimens printed at 0° orientation had the highest push-out strength, comparable to ARIX plates, while those printed at 90° showed significantly lower strength. Higher insertion torque (1.1 Nm) generally improved push-out strength, regardless of the screw angulation. Low torque with angled screws led to significant reductions in push-out strength. Directly 3D-printed locking plate system can achieve mechanical performance comparable to machined counterparts when printed in a 0° orientation and with appropriate torque. Optimal build orientation and careful control of insertion torque are crucial to maximizing the performance of 3D-printed locking plates.

This research was supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (RS-2024-00407214) and by another NRF grant funded by the Korea government (MSIT) (No. 2023R1A2C1003001).

PO-2

Successful management of distal tibial non-union and osteomyelitis following open fracture using meropenem-impregnated antibiotic beads and bone substitute in a dog

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Abstract: Antibiotic beads (AB) are widely used in humans for local antibiotic therapy, but their application in dogs is less documented. This report describes the successful treatment of a surgical site infection and bone union using meropenem-impregnated AB in a dog. A 3-year-old, spayed female Pomeranian dog, weighing 3.2 kg, was referred with non-union osteomyelitis following a tibial open fracture from a bite wound 6 weeks earlier, initially treated with internal fixation. A fistula formed on the medial tibia, with bacterial culture identifying *Enterobacter cloacae*, and antibiotic sensitivity testing was conducted for antibiotic selection. External skeletal fixation was applied in a type Ia configuration for the proximal tibial fragment and type Ib for the distal fragment. The AB were custom-made using polymethylmethacrylate mixed with meropenem and applied during surgery, along with the separation of the adhered Achilles tendon. Rehabilitation, including electrical muscle stimulation, passive range of motion, and massage, began 1 week post-surgery. The AB were removed at 3 weeks, and the bone defect was filled with allogeneic cancellous bone, demineralized bone matrix, recombinant human bone morphogenetic protein, and hydroxyapatite, with platelet-rich plasma injected into the surrounding soft tissues. By week 11, the dog was fully weight-bearing without lameness. Radiographs at 13 weeks confirmed cortical continuity, and the external fixation was removed at 15 weeks. The dog recovered without complications but died 11 months later due to meningoencephalitis of unknown origin. This is the first report of meropenem-impregnated AB use in a dog, demonstrating its effectiveness in local infection control.

PO-3

Case report : Surgical management of an occipital condyle fracture in a dog using a customized three-dimensional printed implant for occipitocervical stabilization

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Abstract: A 10-year-old male castrated Pomeranian was evaluated after a fall, presenting with tetraparesis, dysphagia, and a head turn. Magnetic resonance imaging (MRI) revealed a right occipital condyle fracture causing medullary compression and cerebellar infarction from a displaced bony fragment. According to the Anderson and Montesano classification, this case was categorized as type 3, indicating instability, and surgical correction was considered. A bone fragment located at the medulla oblongata was left in situ due to the potential risk of severe complications from removal. To prevent further damage from instability, occipitocervical stabilization surgery was performed. A patient-specific 3D-printed implant was designed; screws were applied to the occiput and C1 vertebra using standard techniques, while a screw was inserted transversely into the C2 spinous process to minimize the risk of implant failure from neck flexion. Postoperative computed tomography (CT) confirmed proper implant placement without neural injury. Over time, the patient showed improvement in hypoglossal dysfunction and gait, leading to discharge on postoperative day 5. Occipital condyle fractures are rare in both veterinary and human medicine, with most cases classified as type 1 or 2, which typically do not require surgical intervention. To the best of the authors' knowledge, this is the first reported case of surgical management of an occipital condyle fracture in a dog. Additionally, the implant used in this case has not been previously reported, suggesting that it could be utilized not only for occipital condyle fractures but also in patients with craniocervical junction disorder.

PO-4

A case of a cat with an non-union of a femoral diaphyseal fracture preoperatively planned for reduction and stabilization using a 3D-printed model

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Abstract: A 3D printer can produce the highly detailed bone models based on CT data, significantly improving preoperative planning by providing a more precise understanding of complex anatomical structures. This case report highlights the successful application of a 3D-printed model for preoperative planning in a 7-month-old domestic short-haired cat with non-union of the left femoral diaphysis. The cat initially presented with a left femoral fracture, an open fracture of the phalanx in the right forelimb, and a defect extending from the bottom of the left shoulder joint, the patient was also in prostration. While the right forelimb was treated referral doctor, the left femur remained untreated, leading to the patient's refer to VTH in Azabu University. Radiographs revealed a comminuted fracture, but the precise fracture shape was unclear, necessitating a CT scan. Using the CT data, a 3D-printed model of the fractured femur was created, allowing a detailed rehearsal of the open reduction and internal fixation (ORIF) procedure. The actual surgery closely followed the rehearsal, although some adjustments in plate placement were required during the procedure. Postoperatively the cat showed to be able to stand and walk, with gradual improvement in weight-bearing lameness, and radiographs confirmed ongoing bone union. This case highlights the effectiveness of 3D-printed models in preoperative planning for complex fractures, enhancing surgical accuracy and potentially reducing anesthesia time. However, it also emphasizes the limitations of these models in non-union cases, where fibrous tissue may complicate surgical outcomes.

PO-5

Establishing a practical protocol for two-dimensional kinematic gait analysis of the feline hindlimbs

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Abstract: Diagnosing degenerative joint diseases in cats presents significant challenges due to their inherently sedentary nature, which often leads to the condition being overlooked. Gait analysis offers an objective and sensitive approach to evaluate joint function, assist in diagnosing lameness, monitor disease progression, and assess therapeutic efficacy. However, compared to dogs, there is limited information available on gait analysis in cats, primarily due to the difficulty of guiding cats into steady walking during examinations, which makes related research challenging. This study aims to establish a practical protocol for two-dimensional kinematic gait analysis of the feline hindlimbs. Twelve clinically healthy cats were included in the study. Markers were applied to the skin surface over the hip, stifle, and tarsal joint initially. The cats walked through a transparent acrylic tunnel while industrial cameras positioned at fixed locations on either side recorded the movement of the hindlimbs. The gait pathway was designed to be 220 cm in length. Various incentives were used at the end of the tunnel to entice the cats to reach the endpoint. Customized software was developed to analyze the maximum extension and minimum flexion angles, as well as the range of motion, of the hip and stifle joints during walking. The results showed that the success rate of this protocol was 92%, and that joint angle data were successfully retrieved. This study successfully established a practical protocol for two-dimensional kinematic gait analysis of the feline hindlimbs, which holds potential for future clinical applications.

PO-6

Prediction of cruciate ligament footprints in dogs using dual-plane X-ray images

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Abstract: Accurate skeletal shape and ligament positions are essential for biomechanical research and patient-specific anatomical repairs in ligament disorders. Computed tomography (CT) is commonly used to reconstruct accurate 3D bone shapes, but it poses inherent risks to patients, such as complications from anesthesia and exposure to ionizing radiation. Building on an accurate representation of bone shapes, a deformable shape template (DST) method has recently been introduced to provide estimations of ligament footprints. In this study, we proposed a scan-free approach for estimating cruciate ligament footprints. A feature-based 3D-2D registration method, utilizing dual-plane X-ray images and the DST, was implemented to construct patient-specific bone shapes, followed by the derivation of ligament outlines. To assess the prediction outcomes, the X-ray images were acquired from 12 hindlimb specimens at angles of 90°, 60°, 30°, and 0°, respectively, using a surgical C-arm system. To generate the dual-plane image data, we paired images taken at 90°-60°, 90°-30°, and 90°-0° angles, respectively. The estimated footprint centroids were compared to ground truth data, and the estimations using CT-derived bone shape models. The average Euclidean errors of footprint centroids of the cranial and caudal cruciate ligaments (CrCL and CaCL) were 0.8 and 0.6 mm on the femoral site, and 1.1 and 1.2 mm on the tibial site (Table 1). The errors were not significantly different from those obtained using CT-derived bone models (Table 1). In conclusion, the proposed method presents an alternative solution for achieving accurate and efficient predictions of ligament footprints while eliminating the need for CT scans.

Table 1. Euclidean errors of the predicted footprint centroids using the DST with CT-derived bone shapes through 3D-3D registration (DST_{CT}) and the DST with dual-plane X-ray images through 3D-2D registration (DST_{XRay}). The data was expressed in means± standard deviations.

	Ligament	DST_{CT} (mm)	DST_{XRay} (mm)
Femur	CrCL	0.9±0.6	0.8±0.4
	CaCL	0.6±0.4	0.6±0.3
Tibia	CrCL	1.2±0.6	1.1±0.4
	CaCL	1.2±0.8	1.2±0.5

PO-7

Repair of common calcaneal tendon rupture using a polyethylene implant and flexor digitorum lateralis augmentation in a dog

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Abstract: A 5-year-old castrated male Poodle dog was referred for a chronic complete rupture of the common calcaneal tendon (CCT) resulting from trauma. The dog presented with left hind limb lameness and a plantigrade stance. Physical examination revealed hyperflexion of the tarsal joint, and the stumps of the ruptured tendon were palpated. Surgical reconstruction was performed, and the CCT was found to be completely ruptured. The surrounding tissues were dissected, and both tendon stumps were mobilized; fibrous scar tissue was excised. The tendon stumps were sutured using a polypropylene locking loop suture, remaining a 2-cm defect. To bridge this gap, a synthetic polyethylene implant (FiberTape®: Arthrex, Naples, Florida, USA) was placed over the tendon and defect region in two layers and secured with simple interrupted polypropylene sutures. For augmentation, the flexor digitorum lateralis tendon was separated from the tibia, retracted caudally, and then sutured to the CCT and polyethylene implant using simple interrupted polydioxanone sutures. Postoperatively, a Robert Jones bandage was applied for three weeks. At the three-month follow-up, the range of motion of the tarsal joint had improved, allowing flexion to 60 degrees and full extension. Limb function returned to normal during walking, as confirmed using a force plate gait analyzer. No other complications were detected. This case demonstrates that a chronic complete CCT rupture can be successfully repaired using a synthetic polyethylene implant in conjunction with flexor digitorum lateralis tendon augmentation.

PO-8

Medial and lateral fabello-patellar sutures combined with trachleoplasty for the correction of bidirectional patellar luxation in dog: A case report

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Abstract: A 2-year-old female Pomeranian dog with chronic lameness of both hindlimb was referred to the Veterinary Teaching Hospital, Prince of Songkla University, Songkhla, Thailand. Orthopedic examination and stifle radiography confirmed bidirectional patellar luxation (BPL). A surgical approach to the stifle was performed via a craniolateral parapatellar incision. Trochlear wedge sulcoplasty was performed using a standard technique. Medial and lateral fabello-patellar sutures were done by anchoring the medial and lateral fabella toward the patella with nonabsorbable suture (polypropylene) to prevent the patella from luxation. Imbrication of the medial and lateral retinacula and joint capsules were additionally performed. Surgical outcome was favorable without progression of osteophyte formation. Weight bearing improved within 10 days after operation without any complication. Successful management of BPL was achieved using a combination of femoral trochlear groove deepening and soft tissue reconstruction techniques.

PO-9

Spinal epidural empyema secondary to foreign body in a cat: A case of delayed treatment and favorable outcome

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Abstract: A 2.8 kg, 5-year-old female Korean shorthair cat presented with hind limb paralysis which had persisted for a month without any treatment. Neurological examination revealed hind limb paraplegia with deep pain sensation. Blood tests showed elevated inflammatory markers and anemia. Cardiac and abdominal ultrasounds showed no other significant findings. MRI and CT scans identified a mass which was severely compressing the spinal cord at the level of L2–3. According to the diagnostic images, the mass was suspected to be a spinal epidural empyema caused by a foreign body or, less likely, a tumor.

A hemilaminectomy was performed to decompress the spinal cord by removing degenerative tissue and suspected foreign material. Histopathological examination confirmed suppurative and plasmacytic inflammation, along with the presence of bone and acellular amorphous material. Cultures from the spinal abscess were negative for bacterial growth. Post-operatively, the cat was treated with antibiotics and analgesics, showing rapid recovery. On the post-operative day 22, the cat had almost fully recovered, with normal gait and urination.

Foreign body-induced spinal epidural empyema is a rare condition in veterinary medicine, with very few reported cases. While early surgical decompression and foreign body removal, combined with appropriate antibiotic therapy, are known to result in successful outcomes, this case demonstrates that even with delayed intervention, proper diagnosis and treatment can lead to favorable prognosis.

This study received no financial support.

PO-10

Case report: frameless stereotactic cystoperitoneal shunt placement and dorsal laminectomy of the atlas for treating intracranial arachnoid cyst with atlantooccipital overlapping in a dog

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Abstract: A 5-year-old neutered Chihuahua dog weighing 3.6 kg was referred for evaluation of neck pain and right-side ataxia. Complete blood count and chemistry profiles were normal. Radiography results showed normality in the vertebral spine. At first, the neurological examination revealed obtunded mentation, neck stiffness, dysmetria gait and delayed response to a proprioception test on the right-side limb. Additionally, decreased responsiveness was observed on the right side of the face. Neuroanatomical localization was identified as right brainstem and cervical myelopathy. Brain magnetic resonance imaging (MRI) demonstrated well- demarcated fluid-filled structure in the region of the quadrigeminal cistern. This cyst showed hypointense on T1, hyperintense on T2 and suppression FLAIR image, and non-contrast enhancement of gadolinium administration. Moreover, computed tomography scan (CT-scan) showed the lamina of the atlas overlapped into the caudal part of the caudal brainstem. Based on MRI and CT-scan results, the definitive diagnosis was intracranial arachnoid cyst (IAC) with atlanto-occipital overlapping. Due to lack of response to medical treatment, a surgical procedure involving cystoperitoneal shunt and dorsal laminectomy of the atlas were achieved for improve cerebrospinal fluid flow and reducing cerebellar compression. For surgical procedure, the frameless stereotactic navigation technique was used to accurately direct the proximal catheter and avoid transverse sinus laceration. The postoperative CT scan showed that the proximal catheter in the IAC was in the correct position. After surgery, the dog continued improving neurological signs without complications during one year of monitoring.

PO-11

Non-traumatic Lumbosacral luxation caused by discospondylitis in a dog

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Abstract:

In general, the most common cause of lumbosacral fracture-luxation is trauma. Recently, non-traumatic lumbosacral fracture-luxation in toy poodles has been seen in Japan, but the underlying causes are unknown. The case was a toy poodle, a 9-year-old castrated male. He had a history of diabetes. At the time of the first visit to our hospital, the patient had decreased postural response and spinal cord reflexes in the hind limbs and tail motility, although urinary function and deep pain sensation were normal. Magnetic resonance imaging revealed dislocation between L7 and S1 with nerve compression on T2W images. The surrounding soft tissues showed contrast enhancement on post-contrast T1W images. The dog underwent dorsal laminectomy, removal of protruding disc material, and vertebral body fusion using positive threaded pins and polymethylmethacrylate. There were 12 positive threaded pins inserted into the L7-S1 articular processes, L6, L7 and S1 pedicles, and medial aspects of the iliac wings. Intervertebral disc material collected during surgery was submitted for culture testing. As Burkholderia cepacia was detected, norfloxacin and doxycycline were given for 3 months. His neurological abnormalities resolved 2 weeks after surgery. In this case, the cause of the lumbosacral dislocation might have been discospondylitis. There was no evidence of the recurrent infection or dislocation at the time the antibiotics were stopped. In the case of non-traumatic lumbosacral fracture-luxation, submitting intervertebral disc material of the lesion for bacterial culture might help to confirm discospondylitis.

PO-12

Successful of repairing duodenal perforation with vascularized jejunal flap in a Siberian husky dog : a case report

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A 9 years old Siberian husky dog was presented with vomiting and abdominal pain. Abdominal ultrasonography shown peumoperitoneum with peritoneal effusion and foreign body in stomach. Gastrointestinal perforation was suspected. Abdominal exploration found proximal duodenal perforation at antimesenteric site, was 1 cm. from pyloroduodenal junction and a hard foreign body intraluminal of pyloric antrum were seen from perforated site but unsuccessful removal via duodenal defects. Gastrotomy was performed to remove foreign body. A vascularized jejunal flap was harvested from the healthy jejunum and created a rectangle to repair a 1.5 x 2.5 cm defected antimesenteric site of proximal duodenum. The dog was discharged from critical care unit 2 weeks after surgery with appetite and without vomit. Vascularized jejunal flap is the possible option technique to repair the proximal duodenal injury which has connected part to others important organ and could not repair by standard suturing.

PO-13

The gastroduodenostomy (Billroth I procedure) for the treatment of gastric gastrointestinal stromal tumor in cat

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Abstract: An eight-year-old, domestic short hair female spayed, FIV positive cat presented with anorexia and intermittent vomit for 1 month. The cat was depressed, 5% dehydration and a pain-less cranial abdominal mass could be palpated. Abdominal ultrasound confirmed a large focal extramural mass at the greater curvature from gastric body to pylorus, however, the CT scan revealed no evidence of distance metastasis. Routine blood tests revealed mildly elevated BUN. Partial gastrectomy using a TA staple combined with Y-U pyloroplasty and a gastrojejunostomy (G-J) tube placement was done. Nutrition was administered through J-tube and G-tube was for decompression and administration of gastroprotective agent. However, the cat developed obstructive signs and continued to vomit on day 3 post-surgery. Iohexol study (10 mg kg^{-1}) through the G-tube and upper GI endoscopy confirmed pyloric antrum obstruction, necessitating a surgical revision using Billroth I after 6 days post-surgery. Liquid hydrolyzed protein diet was administered via the J-tube at 1/5 RER and split into every 4 hours. The J-tube was removed 11 days post-operatively then oral feeding was initiated. The total hospitalization time was 20 days. The cat showed improved gastrointestinal signs and the G-tube was removed on day 34 after the first surgery. The histopathology and immunohistochemistry reported as gastric gastrointestinal stromal tumor with clear margins. The cat received no chemotherapy and showed normal signs during 12 months follow-up with unremarkable abdominal ultrasound lesions.

PO-14

Rare Ileocecocolonic Intussusception in a Dog with Anaplasma platys Infection: Clinical Presentation, Pathogenesis, and Surgical Management

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Intussusception occurs when one intestinal segment telescopes into another, leading to obstruction. Colonic intussusception is less common than small intestinal intussusception in dogs, comprising less than 15% of cases. Colonic cases often involve chronic signs and distinct underlying causes. This report describes a rare ileocecocolonic intussusception in a dog with Anaplasma platys infection, offering insights into its pathogenesis and surgical treatment.

A 3-year-old spayed female Thai bangkaew dog, weighing 20 kg, presented with a one-month history of diarrhea with hematochezia, vomiting, anorexia, and pica (ingestion of stones and soil). Examination revealed a palpable rectal mass. Bloodwork showed leukocytosis, anemia, hypoalbuminemia, and Anaplasma platys infection. Ultrasound showed a heteroechoic splenic parenchyma and a colorectal mass. A barium study indicated colon obstruction. Surgery revealed a 20 cm ileocecocolonic intussusception, and resection with jejunocolonic anastomosis was performed. The dog fully recovered and remained clinically normal one year later.

Colonic intussusception typically arises from chronic conditions like inflammation or motility disorders. unlike small intestinal intussusception, which is often linked to acute causes like enteritis or foreign bodies. In this case, pica likely caused mechanical irritation, while Anaplasma platys contributed to anemia and inflammation, exacerbating motility issues. Early recognition and surgical management are essential for favorable outcomes. This case emphasizes the importance of considering colonic intussusception in chronic GI presentations, especially with concurrent infections.

PO-15

Enterocutaneous fistula as a long-term complication of jejunostomy tube placement in a dog with hyperadrenocorticism

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Abstract: Jejunostomy tube (JT) has been recommended for early nutritional support after gastrointestinal surgery and critical patients. This case report describes an 11-year-old 2.9 kg Maltese dog presented with gastrointestinal symptoms and a focal cellulitis with purulent discharge. The dog had previously undergone intestinal anastomosis and JT placement due to a foreign body ingestion, recovering without any complications 4 months prior. The dog was diagnosed enterocutaneous fistula from subcutaneous to intestinal lumen by ultrasound and fistulography and the dog was diagnosed hyperadrenocorticism (HAC) as the post cortisol level was over 20 ug/dL by adrenocorticotropic hormone (ACTH) test. HAC is known to cause increased glucocorticoid levels, skin thinning, reduced skin elasticity, and increased susceptibility to skin infections, which were considered contributing factors in the development of the enterocutaneous fistula in this case. Surgical management of the fistula included intestinal anastomosis and resection of the fistulous tissue. No recurrence was observed after 3 years, with the dog managed for HAC with trilostane. This case suggests that in patients with underlying conditions such as HAC, which impair wound healing and promote inflammation, long-term complications such as enterocutaneous fistula formation may result from incomplete closure of jejunal stoma.

This is the first reported case of enterocutaneous fistula as a long-term complication associated with JT placement in a dog.

PO-16

Pyloro-Duodenectomy with Gastroduodenostomy End-to-Side Anastomosis for Duodenal Mass with Intestinal Adenocarcinoma in a Dog

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Introduction:

Canine small intestinal adenocarcinoma is a rare malignant tumor with a low occurrence rate of 0.3%. It is locally invasive and has a moderate metastasis rate, often requiring surgical resection. This case involves a duodenal mass and duodeno-duodenal intussusception, which necessitated the performance of pyloro-duodenectomy with gastroduodenostomy end-to-side anastomosis.

Case:

A 12-year-old neutered Schnauzer dog displayed symptoms of depression and chronic vomiting over a period of 2 to 3 months. Abdominal ultrasound revealed a duodenal mass at the gastroduodenal junction to the proximal duodenum. Further confirmation through Computerized Tomography (CT) revealed gastric mural neoplasia and gastro-duodenal intussusception. During exploratory abdomen surgery, duodenoduodenal intussusceptions and a duodenal mass were identified. Initially, pylorotomy and enterotomy were performed to attempt to reduce the size of the duodenal mass at the gastroduodenal junction. However, resection and anastomosis were ultimately required due to the inability to excise the lesion. Following the resection of the pylorus and proximal duodenum, gastroduodenostomy with end-to-side anastomosis was performed. The successful surgical treatment was reported, and the specimen was sent for histopathological analysis, confirming the presence of intestinal adenocarcinoma.

Conclusion:

The surgical procedure was successful, and the patient fully recovered within 7 days post-surgery and was discharged. Fewer complications were observed. Further discussion is needed regarding the associated complications and a comparison of the advantages between the end-to-end and end-to-side techniques. Notably, the patient did not experience recurrent masses during the study period.

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PO-17

Measurement of nasal airflow in a French bulldog using a 3D-printed head model

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Abstract: Structural abnormalities within the nasal cavity are one of the causes of Brachycephalic Airway Syndrome (BAS). Quantifying nasal airflow is essential for assessing the severity of airway obstruction and the effectiveness of surgical procedures. However, no standardized protocol has been established. In this study, we developed and evaluated a method for objectively assessing nasal airflow using 3D-printed dog head models as a tool for measuring nasal patency. This study focused on a 6-year-old neutered male French Bulldog presenting with recurrent respiratory symptoms due to BAS with history of combined surgical correction against airflow obstruction. The patient received a surgical nasal scraping procedure through a palatal approach. Pre- and post-operative CT scans of the head were performed, and the obtained images were reconstructed to create a 3D-printed model of the head of the dog using ABS resin. We treated the nasal cavity within the model as a wind tunnel and measured the fluid velocity from the external nares to the nasopharynx. The results were compared pre- and post-surgery. The experimental results indicated an increase in airflow velocity in the post-operative model. These results suggest that this method provides an effective, objective, and non-invasive way to evaluate nasal airflow patency. It is expected that this model will be used in the future to investigate more ideal nasal surgical procedures.

PO-18

Concurrent malignant tumors in canine patient:

A case report of mixed adenocarcinoma in kidney, ureter and skin in a corgi dog

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Abstract: A rare concurrent malignant tumor (mixed adenocarcinoma) was reported in a 3-year-old intact male Welsh Corgi. He was presented with a rapidly growing, ulcerated cutaneous mass (4×4 cm) on the right dorsal thorax, suspected to be a malignant epithelial tumor based on cytology. On physical examination, severe abdominal distention was noted, and ultrasonography revealed a large cystic structure in the left abdomen. CT scan confirmed a cavitary lesion of the left kidney, left abdominal cryptorchidism, and a calcified thoracic wall mass (right-sided) with right prescapular lymphadenopathy. Routine laboratory tests were normal and the dog exhibited no clinical signs related to the lesions. Exploratory laparotomy revealed compression of caudal vena cava by the cystic structure, with no evidence of other organs abnormality from gross appearance. Left ureteronephrectomy, wide excision of the skin mass, and lymphadenectomy were performed. Histopathology confirmed mixed adenocarcinoma in submucosa of the left proximal ureter, left kidney and skin mass, as well as metastatic adenocarcinoma in the prescapular lymph node. Metronomic chemotherapy with chlorambucil was started at two weeks after surgery. Neither complications, local recurrence, nor metastasis were observed one month postoperatively.

PO-19

Feasibility of the preparation of platelet concentrates using Spectra Optia® apheresis system in healthy dogs

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Abstract: In human medicine, platelet transfusion is a common therapy for the treatment and prevention of bleeding in the perioperative period. As veterinary medicine continues to evolve, the need for platelet transfusion is expected to increase. The purpose of this study was to evaluate the feasibility of using the Spectra Optia® apheresis system to prepare canine platelet concentrates (PCs). Four beagle dogs were used in the first experiment. Peripheral blood platelets were collected using Spectra Optia® under various apheresis conditions. In the second experiment, platelet apheresis was repeated three times in each of the two dogs under fixed apheresis conditions to confirm reproducibility. The following conditions were considered effective for obtaining sufficient PCs: a platelet count of at least 3.0×10^5 platelets μl^{-1} prior to induction of anesthesia in donor peripheral blood, a maximum blood collection flow rate of greater than 60 ml min^{-1}, and a required collection time of greater than 55 min. Under these conditions, the mean platelet count of the apheresis products in the second experiment was 2.4 ± 0.43 (range 1.6-3.0) $\times 10^{11}$ platelets in the second experiment. These results suggest that platelet apheresis using Spectra Optia® can safely produce PCs with a constant platelet collection volume from dogs. It may also depend on the donor's body size and peripheral blood platelet count, so these conditions should be considered in advance to collect a sufficient number of platelets.

PO-20

Imaging analysis of variations in canine renal arterial and venous pathways using CT angiography

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Abstract: Understanding vascular anatomical variations in each case is essential, particularly for laparoscopic surgery and renal transplantation. However, the branching patterns of renal vessels in dogs have not been fully elucidated. Furthermore, previous studies, being based on postmortem dissections, may not accurately reflect in vivo vascular structures. This study aimed to clarify the renal vessel branching patterns in dogs and their correlation with body weight. Abdominal contrast-enhanced computed tomography (CT) images from 135 cases obtained at the Azabu University Veterinary Teaching Hospital between January 2018 and April 2024 were analyzed for branching patterns of renal vessels. Eighteen cases were excluded because of poor contrast conditions; finally, 117 cases were included in the analyses. For statistical analyses, the dogs were divided into two groups based on their body weight: ≤15 kg and >15 kg. The right renal artery exhibited 2 – 10 branches with 22 patterns, whereas the left renal artery exhibited 2 – 9 branches with 27 patterns. Abnormal renal arteries were observed in 24 cases (20.5%). The right renal vein exhibited 1 – 3 branches with four patterns, whereas the left renal vein showed branches 1–3 branches with three patterns. The >15 kg group had a significantly higher number of right renal artery branches ($P = 0.0026$). A strong correlation was observed between the number of branches in each kidney ($r = 0.63$). These findings highlight a diverse range of renal vascular patterns in dogs, with branching being influenced by body weight.

PO-21

Comparison of contrast-enhanced ultrasound characteristics using Visphere™ in dogs with acute kidney injury and acute-on-chronic kidney disease

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Abstract: Acute kidney injury (AKI) is a common renal disorder in dogs, and renal contrast-enhanced ultrasound (CEUS) has recently been utilized to monitor renal perfusion changes in AKI patients. Despite its clinical potential, CEUS is rarely used for diagnosing AKI in veterinary medicine, and no studies have investigated CEUS characteristics in AKI dogs using the novel contrast agent Visphere™ (Trust Bio-sonics, Hsinchu, Taiwan). This retrospective study aimed to compare CEUS parameters between AKI and acute-on-chronic kidney disease (ACKD) in dogs. Six dogs diagnosed with AKI or ACKD at the Veterinary Medical Teaching Hospital of National Pingtung University of Science and Technology (2018–2023) were analyzed. In AKI dogs, time-related parameters (TTP, RT, MTT, slope) were prolonged in both the cortex and medulla, and intensity-related parameters (PI, AUC, WoAUC, WiAUC) were reduced in the medulla, suggesting cortical congestion. In contrast, ACKD dogs exhibited shortened time-related parameters and reduced intensity-related parameters in the cortex, with increased intensity in the medulla. These findings indicate reduced cortical perfusion, resulting in cortical perfusion patterns resembling those of the medulla.

PO-22

Modified prepubic urethrostomy with pelvic osteotomy for treatment of urethrorectal fistula in a cat

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Signalments : A 5-month-old, intact male, Domestic short hair was referred for suspected urethrorectal fistula

Results : The cat had history of dysuria and urine leakage from anus. Computed tomography(CT) revealed urethrorectal fistula. For surgical treatment, pubic osteotomy was performed to approach the urethrorectal fistula. The urethrorectal fistula was identified and ligated. After ligation, urethral stricture was estimated by inserting urethral catheter and injecting contrast medium(Iohexol). Distal urethral stricture was detected. Urethrostomy was suggested for normal urination. Modified prepubic urethrostomy was applied to make a new urethral opening. The urethra was severed before the site of stenosis. The pubic osteotomy was closed by circlage wire. The urethra was passed through the abdominal wall to subcutaneous and skin. The urethral mucosa was incised and sutured to the skin making speculated shape. The cat was hospitalized during 16 days with 10fr foley urethral cathter. After confirming normal urination, the cat was discharged. During 3rd weeks, 4th weeks, 5th weeks, 2nd months and 5th months examinations, chronic bacterial cystitis was present. Antibiotic therapy was applied. There were no severe complications such as urinary incontinence and dysuria.

Clinical relevance : In a urethrorectal fistula, treatment is ligation of the fistula and estimating urethral stricture. If there is urethral stricture, urethrostomy procedure will be suggested. Conventional prepubic urethrostomy is known as a poor prognosis due to severe complication such as urinary incontinence. Modified prepubic urethrostomy is employed to preserve urethra, innervation and blood supply. Depending on the preservation of urethra, other surgical techniques such as subpubic urethrostomy, transpelvic urethrostomy, preputial mucosa urethrostomy can be applied. These surgical techniques offer better prognosis than the conventional prepubic urethrostomy

Acknowledgement:

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Keyword: cat, urethrorectal fistula, dysuria, prepubic urethrostomy, pubic osteotomy

PO-23

A case report of right-sided ectopic ureterocele and ureteral pyogenic infection in an intact male dog

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Abstract:

A nine-year-old intact male toy poodle dog was presented with abdominal pain, lethargy, and decreased appetite. Initial suspicion of a prostatic abscess at a local animal hospital prompted further diagnostic imaging at our facility. Ultrasound and computed tomography scans revealed a right-sided hydroureter due to a ureterocele, along with right renal atrophy. Blood tests indicated elevated inflammatory markers. The tentative diagnosis included a right-sided ureterocele with ureteral infection, right renal atrophy, and right subcutaneous cryptorchidism. Hospitalization with antibiotics was initiated to manage the condition.

Due to poor response to medical treatment, a laparotomy was performed. During surgery, castration and removal of the subcutaneous cryptorchid testicle were completed, along with urethral catheter placement. Abdominal exploration revealed a dilated right ureter and an atrophic right kidney. Fluid samples from the ureter and bladder were collected for culture, and a right uretero-nephrectomy was conducted. An ectopic right ureter was identified and ligated at the ureterovesical junction. The remaining ectopic ureterocele was incised, drained, and omentalized. The abdomen was then lavaged with saline, and a drain and Foley catheter were placed. Cultures confirmed the presence of *Escherichia coli.*

Postoperatively, the dog recovered well under intensive care and antibiotic therapy. The drain and catheter were removed before discharge. Follow-up showed mild urinary incontinence, though repeat cultures were sterile. The case was managed successfully and is currently being monitored for further complications.

PO-24

Clinical management of unilateral uterine torsion in a late-term pregnancy cat

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Abstract: The twisting of a uterine horn or body along its long axis is referred to as uterine torsion, which is a rare occurrence in feline species. This case report describes the clinical signs, diagnosis, and treatment of a pregnant cat with uterine torsion. A 2-year-old intact female Maine Coon cat was presented with late-term pregnancy and the delivery of one dead fetus. The cat had naturally bred for 62 days with moderate anemia (hematocrit [HCT] 17.3%) without displaying any abnormal clinical manifestations or signs indicative of parturition. The ultrasonography results indicated the presence of 1/3 of live fetus with a heart rate of 250 beats per minute and 2/3 of deceased fetuses. The predicted parturition date was calculated approximately 10 days before parturition. 2 days later, a significant amount of seropurulent vaginal discharge was observed, and a cesarean section was deemed necessary. The viable fetus self-delivered as the queen was being transferred to the operating room. Subsequently, an ovariohysterectomy was performed. The uterus was exteriorized, revealing a dark color of the left uterine horn with a 720º counterclockwise torsion around the uterine base. Unfortunately, the kitten had worsened and died 3 days later. After 10 days of follow-up, the queen showed improvement in anemia and had no clinical signs. In our opinion, this case is the first report of a self-delivered prenatal kitten who survived from the uterine torsion cat.

PO-25

Successful surgical intervention for idiopathic noncirrhotic portal hypertension with refractory ascites in a dog

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Abstract: Idiopathic noncirrhotic portal hypertension (INCPH) is characterized by portal hypertension (PH) in the absence of significant liver disease or vascular obstruction, manifesting as ascites, splenomegaly, and variceal bleeding. Limited data is available on INCPH due to its rarity in veterinary medicine. An 11-year-old, 5 kg castrated male Miniature Poodle presented with persistent ascites for 3 weeks. The patient underwent abdominal paracentesis, with 600 ml of ascitic fluid removed two weeks prior to admission, 400 ml one week prior, and 410 ml on the day of presentation. A thorough physical examination, comprehensive blood work, and diagnostic imaging—including radiography, ultrasound, and CT—revealed ascites, splenomegaly, hepatomegaly, and decreased portal vein velocity (5–6.6 cm/s), leading to a diagnosis of PH. Prehepatic and posthepatic causes were ruled out, confirming intrahepatic PH. Despite medical treatment, the ascites persisted. To determine the underlying cause of intrahepatic PH, a liver biopsy was performed. A splenectomy was also conducted due to findings of splenic enlargement and congestion. Histopathological examination of the liver confirmed a diagnosis of INCPH. Postoperatively, the dog experienced transient complications, including increased cPL, hypoalbuminemia, and mild anemia, all of which were managed with supportive care. From postoperative day 4, the patient showed significant improvement, with resolution of ascites and normalization of portal vein velocity (17–18 cm/s). This case report indicates that splenectomy could be a viable therapeutic option for dogs with abundant ascites due to PH associated with INCPH unresponsive to medical management.

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PO-26

Case report: spontaneous left lateral liver lobe torsion in a dog

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Abstract:

Liver lobe torsion is extremely rare in dogs. A nine-year-old, 43kg neutered male mixed-breed dog presented with sudden onset of lethargy, vomiting and panting for one day. Physical examination showed a body condition score of eight out of nine, mild abdominal distension, and shallow breathing pattern. Hematology and serum biochemistry examination revealed leukocytosis and significantly elevated liver enzymes, while the SNAP canine pancreatic lipase test was abnormal. Computed tomography (CT) angiography identified mild peritoneal effusion, decreased attenuation in the left hepatic lobes. The left lateral hepatic lobe appeared slightly enlarged, with portal vein dilated, and lack of contrast enhancement. The tentative diagnosis was left lateral liver lobe torsion. An exploratory laparotomy with lobectomy was scheduled.

The patient was positioned in dorsal recumbency, and a standard ventral midline laparotomy was performed. A 180-degree torsion of the left lateral liver lobe was identified, with the lobe appearing dark red without gross evidence of neoplasia. A complete left lateral liver lobe lobectomy was performed using an endoscopic gastrointestinal anastomosis stapler, along with vessel sealing device. The wound was closed after confirming no bleeding was present. The procedure was completed without complications, and the patient was discharged five days postoperatively. Histopathology revealed sub-capsular hepatic hematoma and congestion. Liver enzymes drastically decreased within ten days, and the dog showed great recovery.

Overall, the prognosis of spontaneous left lateral liver lobe torsion in this patient was excellent, with CT imaging proving helpful for diagnosis and surgical planning.

PO-27

Comparison of computed tomographic features of hepatocellular carcinoma, cholangiocarcinoma, and lymphoma in cats

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Abstract: Hepatocellular carcinoma (HCC), cholangiocarcinoma, and lymphoma are common malignant tumors in cats, requiring distinct treatment and with varying prognoses. HCC and cholangiocarcinoma typically require surgery, with HCC offering better postoperative survival, while lymphoma is treated with chemotherapy. Given the risks of biopsy, non-invasive differentiation using computed tomography (CT) can aid in treatment planning and prognosis evaluation. This retrospective study analyzed triple-phase CT images of 13 cats with confirmed neoplasms. Clinical data and both qualitative and quantitative image analyses were performed. The results revealed that HCC (100%) and cholangiocarcinoma (100%) frequently presented as solitary lesions. In the portal and delayed phases, HCC typically showed diffuse enhancement (71%), whereas cholangiocarcinoma commonly exhibited a central-to-peripheral enhancing pattern (67%, p=0.0330). However, similar imaging features in the delayed phase were observed for both tumors due to overlapping pathological characteristics. Lymphoma typically presented as multiple hypoenhancing nodules (100%) in the portal and delayed phases, and often included hepatic lymphadenopathy (67%). In conclusion, while HCC and cholangiocarcinoma show distinct enhancement patterns, their similar features in the delayed phase complicate differentiation. Lymphoma, however, presents distinct imaging features, making CT valuable in differentiating these tumors for treatment planning.

PO-28

Transjejunal venous coil embolization of a left divisional intrahepatic shunt in a cat

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Abstract: A 2-year-old castrated male exotic shorthair cat was referred due to hypoproteinemia and microhepatia. On the first evaluation, he had a good general condition, and his body weight was 3.6kg. Blood test revealed hypoalbuminemia, low blood urea nitrogen (BUN), hyperammonemia and high serum total bile acid. Computed tomography revealed a short intrahepatic PSS in the left hepatic division, but not patent ductus venosus. Transjuejunal venous coil embolization was planned 43 days after the initial evaluation. For the coil embolization, a 4-cm-long median celiotomy was made on the caudal side of the umbilicus, and the jejunum was retracted out of the abdomen. A 24-Fr over-the-needle catheter was placed in the jejunal vein to measure portal venous pressure, which was 9 mmHg. A 4-Fr, 7-cm-long introducer sheath was placed in another jejunal vein, and then, a 4-Fr hook catheter was advanced into the main trunk of portal vein. A 1.9 to 2.8-Fr microcatheter was inserted through the hook catheter, and a 6-mm-diameter, 10-cm-long microcoil and additional 4-mm-diameter, 8-cm-long microcoil were implanted with measuring the portal venous pressure, which was 11 mmHg. After 2 microcoils were implanted, portography showed the complete attenuation of the shunt vessel. The celiotomy was routinely closed. The transjejunal venous coil embolization was completed for 90 min without any intraoperative complications. This case report demonstrated the successful treatment of transjejunal venous coil embolization in a cat with a left divisional intrahepatic shunt. This procedure may be effective in case of short shunt vessel of feline intrahepatic PSS.

PO-29

Management of iatrogenic pneumothorax during laparoscopic ligation of a congenital extrahepatic portosystemic (left gastric-phrenic) shunt in a dog

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Abstract: Laparoscopic surgery is performed to treat congenital extrahepatic portosystemic shunts in dogs. A 5-year-old spayed female Poodle (3.9 kg) presented with hematuria. Blood analysis showed increased alkaline phosphatase and low blood urea nitrogen. Microhepatica and urolithiasis were detected via radiography and ultrasonography. A computed tomography angiography demonstrated a shunting vessel, originated from the left gastric vein, and linked with the phrenic vein. Laparoscopic surgical attenuation using cellophane banding was initiated. During dissection of the shunting vessel, capnometer abnormality and decreased SpO2 (69%) were observed. Carbon dioxide (CO_2) insufflation was stopped, and gas was removed from the abdomen. A sustained inflation at 30 cmH_2O for 5 seconds was applied for the third time, followed by the application of positive end-expiratory pressure at 4 cmH_2O. However, this intervention resulted in minimal improvement in end-tidal CO_2 and tidal volume. A portable X-ray confirmed pneumothorax, likely due to diaphragmatic damage during dissection. A trocar was added to the chest for CO_2 drainage, improving tidal volume and SpO_2, which returned to 95% after 10 minutes. Surgery resumed at reduced pneumoperitoneum (3-5 mmHg), and the shunting vessel was successfully banded. Postoperative recovery was uneventful, with no pneumothorax on the thoracic X-ray the next day. This case highlights the importance of suspecting pneumothorax during laparoscopic surgery if diaphragmatic damage is possible, and using respiratory monitoring and mechanical ventilation to manage complications.

PO-30

A Case Report: Canine Pulmonary Hypertension Following Lobectomy

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This case report describes the management of a dog with pulmonary hypertension (PH) secondary to lung lobectomy. A 13-year-old neutered male Welsh Corgi was referred for an intrathoracic mass. Computed tomography revealed a mass lesion in the right caudal lung lobe with invasion of the right middle and accessory lobes. Cytological examination suggested lung adenocarcinoma. A lobectomy of the right middle, caudal, and accessory lobes was performed. The mass was diagnosed as lung adenocarcinoma on histopathological examination. On the third postoperative day, labored respiration and diffuse pulmonary air bronchogram were observed, therefore, pulmonary edema was suspected. Administration of antimicrobial agents, diuretics and corticosteroids were initiated. Improvements in breathing conditions and in the alveolar pattern on X-rays was observed on the fourth postoperative day. Between the fourth and sixth postoperative days, the main pulmonary artery exhibited a tendency to dilate(MPa/Ao 1.03→1.28), tricuspid regurgitation manifested(4.13 m/sec), therefore, PH was suspected. Administration of sildenafil resulted in improvement on the seventh postoperative day, and the patient was discharged on the ninth postoperative day. Sildenafil administration was discontinued on the 56th postoperative day. Recurrence of the symptom was not observed on the 80th postoperative day. The etiology of postoperative PH is hypothesized to be elevation in pulmonary vascular resistance caused by the lobectomy, and major lobectomy might be constituting a potential risk factor.

PO-31

A Case Report of a Dog with Structural Esophageal Abnormalities Showing Symptom Improvement Following Surgical Treatment for Brachycephalic Airway Syndrome

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Abstract: Brachycephalic airway syndrome (BAS) is frequently associated not only with respiratory symptoms but also with gastrointestinal issues, such as gastroesophageal reflux and hiatal hernia. This case report presents a dog with BAS, regurgitation, and distinct esophageal structural abnormalities, where surgical treatment for BAS improved regurgitation symptoms. A seven-year-old neutered male French Bulldog was presented to our Animal Medical Center with dyspnea, frequent regurgitation, and recurrent aspiration pneumonia. A fluoroscopic esophagram demonstrated a U-shaped curvature of the cranial thoracic esophagus ventrally toward the sternum, with pooling of contrast material at the curve. Retrograde flow of the contrast material into the pharynx was observed during expiration, worsening as dyspnea increased. Further evaluation of dyspnea and esophageal abnormalities was scheduled under anesthesia the following day. An oral examination under anesthesia revealed an elongated soft palate. Endoscopy confirmed the esophageal curve in the cranial thoracic region without abnormal narrowing. The dyspnea was attributed to BAS (stenotic nares and elongated soft palate), while the recurrent regurgitation and aspiration pneumonia were linked to the esophageal abnormality, with dyspnea exacerbating the condition. Surgical intervention, including stenotic nares resection and soft palate resection, was performed. Postoperatively, respiratory status improved, and fluoroscopic esophagography on postoperative day 2 showed smooth passage of contrast medium into the stomach. The dog was discharged on postoperative day 3, and by day 68, regurgitation frequency had significantly decreased with no further aspiration pneumonia episodes. This case highlights the successful surgical treatment of BAS and its positive impact on associated gastrointestinal symptoms.

PO-32

The surgical repair of congenital peritopericardial diaphragmatic hernia in a Scottish fold cat: A case report

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Abstract: Peritoneopericardial diaphragmatic hernia (PPDH) is the most frequently encountered congenital defect affecting the diaphragm and pericardium in cats. This report aims to present a case of a 4-month-old intact male Scottish Fold cat diagnosed with PPDH, focusing on the surgical technique of pericardial drain insertion and the long-term outcome. The patient had acute vomiting signs. Physical examination revealed abdominal breathing and mild abdominal discomfort upon palpation, with no history of dyspnea or cyanosis. Thoracic radiography confirmed the diagnosis of diaphragmatic hernia, while abdominal ultrasonography revealed displacement of parts of the liver and gall bladder into the pericardial space, along with thickening of the intestinal wall. After two weeks of supportive treatment, the vomiting was improved, and incidental congenital PPDH was diagnosed. Surgical repair of the PPDH was performed, the hernial contents were liver and gall bladder in pericardial sac. The PPDH was closed with nylon No.3-0, a simple continuous suture pattern. Air was aspirated from a pericardial sac to establish negative pressure by a pericardial tube. Six months post-surgery, the cat exhibited normal breathing and regained overall health.

Keywords: Cat, Pericardial tube, Peritoneopericardial diaphragm hernia, Surgical treatment

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PO-33

A case of a cat with pneumothorax during treatment of idiopathic chylothorax

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Abstract: Fibrotic pleurisy is a common complication of chylothorax. Here, we present a case study of a cat with idiopathic chylothorax and fibrotic pleurisy that developed pneumothorax during follow-up, likely due to pleural damage. The cat, a seven-year-old mixed breed, had been diagnosed with chylothorax two months prior to presentation. At the initial visit (day 1), left thoracentesis was performed to remove pleural effusion; however, the respiratory condition worsened, and imaging studies showed pneumothorax. A feeding tube was placed in the left thoracic cavity to manage the pneumothorax. On day 9, a subtotal pericardiectomy through a median sternotomy was performed, and a closed suction drain (Muranaka Medical Instruments, Osaka, Japan) was placed on the right side of the sternum. Postoperatively, pleural effusion was managed by continuous aspiration in a 100 mL bag (Becton, Dickinson and Company, NJ, USA). On day 11, the removal of the feeding tube on the left side was scheduled. However, during confirmatory aspiration with a syringe, a significant amount of air was collected, indicating the presence of pneumothorax, which was not detected postoperatively. Subsequently, the pleural fluid and air were gradually removed from the closed suction drain while monitoring the cat's respiratory condition. Pleural effusion gradually decreased, and the drain was removed on day 80. On day 230, the cat was doing well, with no recurrence of chylothorax or pneumothorax. In cases of fibrotic pleurisy with pleural thickening, the visceral pleura is likely to weaken. Care should be taken to avoid sudden negative pressure during thoracic drainage.