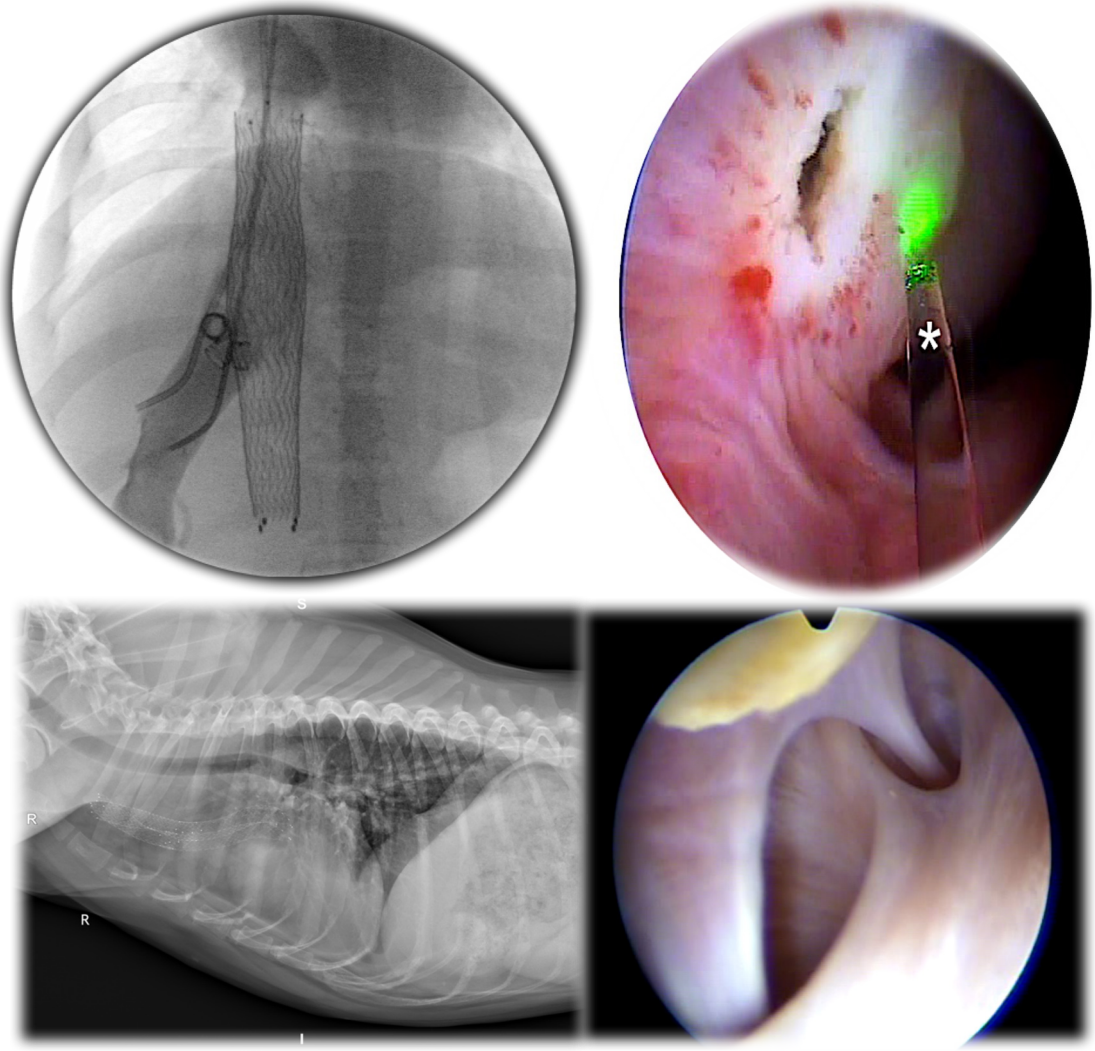
VETERINARY INTERVENTIONAL RADIOLOGY & INTERVENTIONAL ENDOSCOPY SOCIETY

First Annual Meeting

VIRIES



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VIRIES MISSION *To advance the art and science of veterinary interventional radiology and inerventional endoscopy*

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JOIN US FOR OUR NEXT MEETING JUNE 20-24th 2017 in LOS CABOS MEXICO

MEETING SCHEDULE OVERVIEW - Sundance Room

	Sunday June 12th		Monday June 13th		Tuesday June 14th
2h00-2h30	**Welcome/Introduction**	1h30-2h00	**VIRIES Board Meeting**	2h00-2h30	**Scientific Abstract (20min with 10min discussion)** Angiographic versus echocardiographic measures of pulmonary valve diameter in dogs with congenital pulmonary valve stenosis *B. Scansen*
2h30-3h00	**Vendor Introduction**	2h00-2h30	**Literature Review**: Ureteral Obstruction *A. Berent*	2h30-3h30	**Scientific Abstracts (20min with 10min discussion)** 1. Canine tracheal collapse syndrome (CTCS) treated with endoluminal stenting: Short, intermediate, and long-term results in 75 cases (2009–2015). *C. Weisse* 2. Endotracheal wash cytologic and microbiologic results in dogs undergoing tracheal stenting. *D. Clarke*
3h00 3h30	**Review**: Vascular stenting – Experience, Complications, & Challenging Cases *C. Weisse*				
3h30-4h00	**Scientific Abstracts (20min with 10min discussion)** Prospective evaluation of short-term clinical outcome in dogs undergoing percutaneous transvenous coil embolization to treat intrahepatic portosystemic shunts & Prospective evaluation of diagnostic imaging biomarkers in dogs undergoing percutaneous transvenous coil embolization to treat intrahepatic portosystemic shunts *B. Culp*	2h30-3h30	**Scientific Abstracts (20min with 10min discussion)** 1. Ultrasound appearance of the urianry tract in cats with ureteral obstruction treated with a subcutaneous ureteral bypass: retrospective study *M. Dunn* 2. Subcutaneous ureteral bypass device (SUB) placement for benign ureteral obstruction in cats: 137 cats (174 obstructed ureters) (2009-2015) *A. Berent*	3h30-4h00	**Round Table Discussion**
4h00-4h15	**Break (15 min)**	3h30-4h00	**Round Table Discussion**	4h00-4h15	**Break (15 min)**

4h15-4h45	**Cool Cases (7min with 7min discussion)** 1. Caval stenting for treatment of obstructive heart base and cranial vena cava mass *B. Brisson* 2. Spontaneous Resolution of a Caudal vena caval thrombosis/stenosis *N. Peterson*	4h00-4h10	**Break (10 min)**	4h15-5h15	**Scientific Abstracts (20min with 10min discussion)** 1. Evaluation of patient radiation exposure in veterinary procedures utilizing intra-operative fluoroscopy: 360 cases *R. Hersh-Boyle* 2. Fluoroscopic-guided bronchoalveolar lavage (F-BAL) for sampling the lower airways of cats *A. Defarges*
4h45-5h15	**Scientific Abstract (20min with 10min discussion)** 1. Long term clinical outcomes after CT-guided transnare cryoablation in 14 dogs with carcinoma *M. Steffey*	4h10-4h30	**Cool Cases (7min with 7min discussion)** 1. Bilateral SUB in a cat with non-obstructive transitional cell carcinoma of the urinary bladder *T. Furukawa* 2. Minimally invasive management using ureteral stenting and medical dissolution of infection induced massive nephroureterolithiasis in a dog *B. Harling*	5h15-5h30	**Round Table Discussion**
5h15-6h00	**Round Table Discussion**	4h30 5h00	**Round Table Discussion**	5h30-6h00	**Closing Remarks/ Meeting Round-up**
6h00-7h30	**Poster Session with VES**	5h00	**Dinner with VES/VIRIES**		

SOCIAL EVENTS

Sunday June 12th 6h00-7h30 pm - Poster Reception; Sundance lobby, drinks and hors d'oeuvres

Monday June 13th - Gala Dinner - 7h30-10h00; Sundance lobby; purchased tickets required

DETAILED SCHEDULE

Sunday June 12th

2h00-2h30	**Welcome/introduction**
2h30-3h00	**Vendor introduction**
3h00-3h30	**Review**: Vascular Stenting – Experience, Complications, & Challenging Cases *C. Weisse*
3h30-4h00	**Scientific Abstracts (20min with 10min discussion)** Prospective evaluation of short-term clinical outcome in dogs undergoing percutaneous transvenous coil embolization to treat intrahepatic portosystemic shunts & Prospective evaluation of diagnostic imaging biomarkers in dogs undergoing percutaneous transvenous coil embolization to treat intrahepatic portosystemic shunts *B. Culp*
4h00-4h15	**Break (15 min)**
4h15-4h45	**Cool Cases (7min with 7min discussion)** 1. Caval stenting for treatment of obstructive heart base and cranial vena cava mass *B. Brisson* 2. Spontaneous Resolution of a caudal vena caval thrombosis/stenosis *N.Peterson*

4h45-5h15	**Scientific Abstracts: (20min with 10min discussion)** Long term clinical outcomes after CT-guided transnare cryoablation in 14 dogs with carcinoma *M. Steffey*
5h15-6h00	**Round Table Discussion**
6h00-7h30	**Poster Session with VES**

Monday June 13th

1h30-2h00	**VIRIES Board Meeting**
2h00-2h30	Literature Review: Ureteral Obstruction *A. Berent*
2h30-3h30	**Scientific Abstracts (20min with 10min discussion)** 1. Ultrasound appearance of the urianry tract in cats with ureteral obstruction treated with a subcutaneous ureteral bypass: retrospective study *M. Dunn* 2. Subcutaneous ureteral bypass device (SUB) placement for benign ureteral obstruction in cats: 137 cats (174 obstructed ureters) (2009-2015) *A. Berent*
3h30-4h00	**Round Table Discussion**
4h00-4h10	**Break (10 min)**

4h10-4h30	**Cool Cases (7min with 7min discussion)** 1. Bilateral SUB in a cat with non-obstructive transitional cell carcinoma of the urinary bladder *T. Furukawa* 2. Minimally invasive management using ureteral stenting and medical dissolution of infection induced massive nephroureterolithiasis in a dog *B. Harling*
4h30-5h00	**Round Table Discussion**
7h30-10h00	**Dinner with VES/VIRIES**

Tuesday June 14th

2h00-2h30	**Scientific Abstract (20min with 10min discussion)** Angiographic versus echocardiographic measures of pulmonary valve diameter in dogs with congenital pulmonary valve stenosis *B. Scansen*
2h30-3h30	**Scientific Abstracts (20min with 10min discussion)** 1. Canine tracheal collapse syndrome (CTCS) treated with endoluminal stenting: Short, intermediate, and long-term results in 75 cases (2009–2015) *C. Weisse* 2. Endotracheal wash cytologic and microbiologic results in dogs undergoing tracheal stenting *D. Clarke*

3h30-4h00	**Round Table Discussion**
4h00-4h15	**Break (15 min)**
4h15-5h15	**Scientific Abstracts (20min with 10min discussion)** 1. Evaluation of patient radiation exposure in veterinary procedures utilizing intra-operative fluoroscopy: 360 cases *R. Hersh-Boyle* 2. Fluoroscopic-guided bronchoalveolar lavage (F-BAL) for sampling the lower airways of cats *A Defarges*
5h15-5h30	**Round Table Discussion**
5h30-6h00	**Closing remarks/Meeting Round-up**

SCIENTIFIC ABSTRACTS/COOL CASES - Oral Presentations

PROSPECTIVE EVALUATION OF SHORT-TERM CLINICAL OUTCOME IN DOGS UNDERGOING PERCUTANEOUS TRANSVENOUS COIL EMBOLIZATION TO TREAT INTRAHEPATIC PORTOSYSTEMIC SHUNTS

Culp WTN[1], Zwingenberger A[1], Giuffrida MA[1], Wisner ER[1], Hunt GB[1], Steffey MA[1], Mayhew PD[1], Marks SL[2] From the School of Veterinary Medicine, [1]Department of Surgical and Radiological Sciences (Culp, Zwingenberger, Giuffrida, Wisner, Hunt, Steffey, Mayhew) and the [2]Department of Medicine and Epidemiology (Marks), University of California-Davis, Davis, CA 95616.

Objective - To report short-term outcome and complications associated with percutaneous transvenous coil embolization (PTCE) and evaluate the clinical and laboratory changes in dogs with intrahepatic portosystemic shunts (IHPSS) pre- and post-PTCE.

Study Design – Prospective clinical trial.

Animals – 25 dogs with IHPSS.

Methods - Dogs with IHPSS were enrolled and evaluations of clinical signs, bloodwork, and treatments were performed both pre-PTCE and 3 months post-PTCE. All dogs were administered the same medications pre-PTCE and were fed a prescription diet for hepatic disease. All dogs were weaned from medications post-PTCE at the same rate.

Results – Twenty-five dogs were enrolled. Most dogs were large breed, and median age at the time of treatment was 10 months (range, 6-31 months). Clinical signs such as lethargy and ataxia, polydipsia, head pressing, polyuria and vomiting were noted commonly, as were clinical laboratory abnormalities such as decreased BUN, hypoproteinemia, hypoalbuminemia and hypocholesterolemia. Complications associated with the PTCE procedure were rare and minor. At the 3-month post-PTCE evaluation, significant improvement was noted in most clinical laboratory values (eg. BUN, total protein, albumin, cholesterol). All dogs were discharged from the hospital. Twenty-four of 25 dogs were available for reevaluation at 3 months and all abnormal clinical signs had resolved in 22/24 dogs (92%).

Conclusions - PTCE appears to be promising as a treatment modality for IHPSS as clinical signs resolved in most cases, bloodwork abnormalities often normalized, all but one dog had been weaned off medications at study conclusion, and the procedure was performed safely with minimal complications.

PROSPECTIVE EVALUATION OF DIAGNOSTIC IMAGING BIOMARKERS IN DOGS UNDERGOING PERCUTANEOUS TRANSVENOUS COIL EMBOLIZATION TO TREAT INTRAHEPATIC PORTOSYSTEMIC SHUNTS

Culp WTN[1], Zwingenberger A[1], Giuffrida MA[1], Wisner ER[1], Hunt GB[1], Steffey MA[1], Mayhew PD[1], Marks SL[2]. From the School of Veterinary Medicine, [1]Department of Surgical and Radiological Sciences (Culp, Zwingenberger, Giuffrida, Wisner, Hunt, Steffey, Mayhew) and the [2]Department of Medicine and Epidemiology (Marks), University of California-Davis, Davis, CA 95616.

Objective - Minimally invasive treatment of intrahepatic portosystemic shunts (IHPSS) by percutaneous transvenous coil embolization (PTCE) is a novel treatment with promising early results. The objective of this study was to utilize multiple imaging modalities to assess and compare pre- and post-PTCE imaging biomarkers in dogs undergoing PTCE.

Study Design – Prospective clinical trial.

Animals – 15 dogs with IHPSS.

Methods - Dogs with IHPSS were enrolled. Nuclear scintigraphy, ultrasound, and CT angiography, volume, and perfusion analysis were performed prior to and after PTCE.

Results – Liver volume increased significantly post PTCE (p=0.001) however most dogs had liver volumes below the normal range. Hepatic arterial fraction decreased after PTCE (p=0.029). Shunt fraction had a decreasing trend (p=0.13) however all dogs had continued shunting. Response to therapy was not detected with ultrasound. High initial hepatic arterial fraction was correlated to higher postoperative hepatic arterial fraction and lower postoperative liver volume. Dogs with lower initial liver volumes had higher postoperative liver volumes. Nine of 15 dogs had multiple intrahepatic shunts postoperatively.

Conclusions - PTCE was effective in increasing hepatic portal perfusion and liver regeneration in most dogs. Dogs with the lowest portal perfusion preoperatively had a lesser response to therapy, however dogs with small liver volumes had the greatest increase in liver volume. Multiple intrahepatic shunts were common findings. Imaging biomarkers were useful in documenting response to PTCE.

CAVAL STENTING FOR TREATMENT OF OBSTRUCTIVE HEART BASE AND CRANIAL VENA CAVA MASS

Brigitte Brisson[1], Shauna Blois[1], Sylvain Bichot[2], Jeffrey Solomon[3]. [1]Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada, [2]Mississauga Oakville Veterinary Emergency Hospital, Mississauga, Ontario, Canada, [3]Infiniti Medical, Menlo Park, CA.

A 10-year old, spayed female, Golden Retriever was presented for laryngeal swelling and difficulty swallowing. Physical examination revealed pyrexia and marked cervical and facial swelling. Thoracic radiographs revealed pleural effusion cytologically consistent with a transudate. Cervical ultrasound was consistent with marked, generalized interstitial edema. Echocardiography revealed a mass associated with the cranial vena cava and CT of the thorax confirmed the mass was intraluminal. Angiography identified a mass and an associated thrombus obstructing the cranial vena cava. Intravascular biopsy of the mass revealed a sarcoma. The mass/thrombus was balloon dilated and a metallic stent placed to span beyond the mass. Heparin therapy was initiated. The cervical and facial swelling resolved overnight but recurred 1.5 days post-stenting suggesting thrombosis. Angiography confirmed a large thrombus within the stent. TPA was infiltrated within the thrombus and was balloon dilated. TPA was administered locally over 4 hours postoperatively. The dog was discharged with heparin therapy the next day with some residual swelling. She was readmitted 10 days later for dyspnea and inappetance. Thoracocentesis removed 1500ml of serosanguinous pleural effusion and was repeated twice prior to euthanasia 25 days post-stenting. Postmortem examination revealed the presence of a firm, 4cm mass at the junction of the cranial vena cava and right atrium with a large obstructive thrombus. Histopathology confirmed anaplastic sarcoma and immunohistochemistry confirmed hemangiosarcoma.

SPONTANEOUS RESOLUTION OF A CAUDAL VENA CAVAL THROMBOSIS/STENOSIS

Peterson NW, Buote NJ. VCA West Los Angeles, Los Angeles, CA

A 10 year old male castrated Miniature Pinscher Mix presented to the oncology service for evaluation of ascites. Abdominal ultrasound and echocardiogram were unremarkable. Fluid analysis revealed a modified transudate. Abdominal CT was performed to rule out neoplastic causes of the ascites. CTA revealed stenosis of the hepatic caudal vena cava. Fluoroscopic angiography was performed and confirmed stenosis of the hepatic CVC in the lateral view. The patient was recovered and a full coagulation panel and bile acids was performed. The patient returned 6 days later for CVC stent placement and laparoscopic liver biopsy. Blood work was consistent with chronic DIC (high D-dimers, low fibrinogen) and the patient had elevated pre and post prandial bile acids. Pre-stenting angiography revealed the CVC was patent. The left hepatic vein was selectively catheterized and found to be patent, the right hepatic vein appeared partially occluded. Due to these findings stent placement was aborted and the patient proceeded with laparoscopic biopsies of the liver and peritoneum. Patient was discharged the following day on Denamarin and Clopidogrel. The patient had full resolution of ascites and has remained free of clinical signs for 6 months. Biopsy results revealed moderate chronic active hepatitis and mesothelial hyperplasia of the peritoneum. Repeat bile acids, platelet mapping, coagulation panel and TEG were performed at regular intervals and normalized within 2 months.

LONG-TERM CLINICAL OUTCOMES AFTER CT-GUIDED TRANSNARE CRYOABLATION IN 14 DOGS WITH CARCINOMA.

Steffey MA. From the Department of Surgical and Radiological Sciences, University of California – Davis, Davis, CA, USA

Introduction: Intranasal carcinomas in dogs are most commonly treated with radiation therapy, but radiation is unavailable to, or declined by some clients. The aim of this study is to report outcomes associated with transnare cryoablation (TC), a minimally-invasive, palliative therapy for intranasal neoplasia.
Methods: Medical records of dogs receiving TC for treatment of an intranasal carcinoma ≥6 months prior to study inclusion were retrospectively reviewed. Retrieved data included signalment, procedural information, complications, and outcome.
Results: Fourteen dogs (median age 10.5 (range, 7-15) years), median body weight 13.6 (range, 5.1-39.5) kg) met the inclusion criteria. Follow-up times ranged from 5-25 months. Thirteen dogs received 1 TC treatment, 1 dog received TC twice. Three dogs received treatment with both TC and radiation therapy. Overall, TC was well tolerated; observable improvement in nasal breathing was present at 1-month recheck. Oronasal fistula occurred post-TC in 3 dogs, however all 3 dogs had contributory risk factors. Six dogs developed post-TC nasal Aspergillus fungal infections. At the time of reporting, 4 dogs are alive, 1 dog died for reasons unassociated with nasal disease, 9 dogs died due to disease, complications of treatment or reasons undetermined. To date, 9/14 dogs have achieved post-TC survival ≥12 months, and 6 of these dogs achieved post-TC survival ≥18 months.
Conclusions: Results of this study demonstrate that transnare cryoablation can be effective palliation for intranasal carcinoma in dogs. Post-treatment Aspergillus infection risks are high. Further study on clinical outcomes in a larger cohort of patients is warranted.

SONOGRAPHIC APPEARANCE OF THE URINARY TRACT IN CATS WITH URETERAL OBSTRUCTION TREATED WITH SUBCUTANEOUS URETERAL BYPASS (SUB): A RETROSPECTIVE STUDY OF 22 CASES.

Julien Fages[1], Marilyn Dunn[1], Swan Specchi[2,3], Pascaline Pey[3, 1] From the Department of Clinical Sciences, Faculté de médecine vétérinaire,Université de Montréal, Canada, QC J2S 2M2. [2] From the Diagnostic Imaging Service of the Istituto Veterinario di Novara, Italy, 28060. [3] From Antech Imaging Services, USA, 92614 CA.

Introduction: Reported complications related to Subcutaneous Ureteral Bypass (SUB) placement include urine leakage around the nephrostomy or cystostomy catheters or port, occlusion of the SUB device by a blood clot, stone or kinking of the catheters, recurrent urinary tract infection or inflammatory cystitis. To the author's knowledge, the sonographic appearance of the urinary tract following SUB placement has yet to be reported. The objective of the present study was to describe short and long-term sonographic appearance of the urinary tract in cats with ureteral obstruction treated with SUB and identify relevant sonographic parameters for monitoring.

Materials and methods: Twenty-two cats with unilateral (n=18) or bilateral (n=4) ureteral obstruction treated by placement of a SUB device were recruited in this retrospective case study. Appearance and measurement of the width of the renal pelvis along with several qualitative sonographic parameters were recorded for each patient prior to SUB placement (pre-T0) and during the short (T0 > and < 3 months) and long term (>3 months) follow-ups. For both intervals, the most recent review available was used for the qualitative criteria while the average quantitative values were recorded. The complications observed during follow-up were classified as obstructive or non-obstructive.

Results: No qualitative sonographic parameter showed statistically significant changes. The presence of retroperitoneal or peritoneal effusion was rare. Hyperechogenicity of the perirenal adipose tissue decreased in the long term. A statistically significant decrease in the width of the renal pelvis was noted in the short (3.1 mm) and long term (1.5 mm) follow-up, as compared to the preoperative value T0 (12.2 mm). Three months following SUB placement, each patient without an obstructive complication had a pelvis width ≤ 3 mm.

Conclusions: Renal pelvic distension is reversible when ureteral obstruction is treated by placement of a SUB device. Ultrasound monitoring is an essential tool to detect obstructive complications. A renal pelvis measuring 4mm and > is suggestive of occlusion of the SUB device.

SUBCUTANEOUS URETERAL BYPASS DEVICE (SUB) PLACEMENT FOR BENIGN URETERAL OBSTRUCTION IN CATS: 137 CATS (174 OBSTRUCTED URETERS) (2009-2015).

Berent A[1], Weisse C[1], Bagley D[2], Lamb K[3].
1.The Animal Medical Center, NY, NY
2. Thomas Jefferson University, Philadelphia, PA
3. Ken Lamb Consulting, West St. Paul, MN

SUB device placement has been used as an alternative to traditional ureteral surgery, however short and long-term outcomes have not been described.
The objective is to evaluate pre-operative, peri-operative(< 7 days), short(7-30 days) and long-term(> 30 days) parameters in cats treated with a SUB for benign ureteral obstruction(s). The hypothesis is that SUBs associated with a favorable outcome compared with alternatives.
The SUB was placed using fluoroscopic- and surgical-assistance creating an artificial ureter for ureteral diversion. Medical records were reviewed for pre-, intra-, and post-operative data.
174 SUBs were placed in 137 cats (20% bilateral). The cause of obstruction was: ureterolithiasis(67%), stricture(13%), both(20%), or pyonephrosis(0.5%). Placement was successful in all cases. 96.4% of cats were azotemic at presentation. The median creatinine at presentation and 3 month post-SUB was 6.6 and 2.6mg/dL, respectively. The median renal pelvis diameter pre- and post-procedure was 9.1mm and 1.5mm, respectively. Peri-operative complications included device leakage(3.4%), kinking(5%), and occlusion with blood clot(s)(7.5%). 93.7% survived to discharge. Catheter mineralization occurred in 25% of systems (median 364 days), with only13% required exchange due to re-obstruction. Dysuria was reported in 23% of pre-SUB and 8.2% at any time thereafter. The overall MST was 827 days (range,1-2397) and 65% eventually died of renal-related disease. Limitations are related to the retrospective nature of this study.
The SUB device can be considered a treatment option for feline ureteral obstruction(s), regardless of cause, location, or stone number. The prognosis after SUB placement could be considered good to excellent.

BILATERAL SUBCUTANEOUS URETHRAL BYPASS (SUB) IN A CAT WITH NON-OBSTRACTIVE TRANSITIONAL CELL CARCINOMA IN URINARY BLADDER

Takayuki F. 1, Akiko S. 1, Yuka K. 1, Yutaka F. 1, Tetsuya A. 1, Manabu S. 1, Kenichiro O. 2, Hidehiro H. 2
1. Japan Animal Referral Medical Center Nagoya, Aichi, Japan
2. Japan Animal Referral Medical Center Kawasaki, Kanagawa, Japan

An 11 year-old neutered male mixed breed cat was presented with polyuria and hematuria for 5 months. Ultrasonographic examination showed a large mass (37×17 mm) on ventral aspect in middle of bladder, diagnosed cytologically transitional cell carcinoma (TCC). There was no dilation of renal pelvis and both ureters. The mass was diagnosed non-obstructive TCC. Since no effects of medical treatments 4 weeks were observed on tumor size and hematuria, the owner agreed surgical resection. Cystectomy followed by bilateral subcutaneous urethral bypass (SUB) was selected for complete resection of TCC. Briefly, bilateral ureter ligation was done for obtaining dilation of renal pelvis, required for SUB formation. The renal pelvis was gradually dilated up to 5 mm at 18 hours after the ligation. Serum creatinine (Cre) and blood urea nitrogen (BUN) level were elevated from 1.0 to 4.4 (MG/DL) and from 17 to 60 (MG/DL), respectively. Both ureters were cut open on the ligation site and inserted the outer tube of 24 gauge indwelling needle. Retrograde ureter pyelography was carried out from the needle. Bilateral SUB was placed to the kidneys path through the urethra in a conventional method, using double port and connected bladder catheter. Then, cystectomy was done, according to the routine manners. Both Cre and BUN levels were decreased normal levels until 24 hours after surgery. The cat was discharged day 9 and was kept good healthy condition. Therefore, bilateral ureter ligation might be available technique for severe bladder tumor with no renal pelvis dilation.

MINIMALLY INVASIVE MANAGEMENT USING URETERAL STENTING AND MEDICAL DISSOLUTION OF INFECTION INDUCED MASSIVE NEPHROURETEROLITHIASIS IN A DOG.

Brett Harling, Allyson Berent, Chick Weisse. The Animal Medical Center, NY, NY

An approximately 4 yo FS Miniature Schnauzer was diagnosed with renal sepsis based on the clinical findings of pyrexia, severe leukocytosis with a left shift, tachycardia, and presence of pyonephrosis. Diagnostic work-up revealed right hydronephrosis and hydroureter secondary to a proximal obstructive faintly radiopaque ureterolith with secondary pyonephrosis and retroperitoneal abscessation, as well as a massive non-obstructive left nephrolith (7.5 cm). Given the alkaline pH of the urine and concurrent urinary tract infection with Staphylococcus *pseudointermedius*, struvite urolithiasis was suspected. Retrograde ureteropyelography confirmed the presence of an obstructive proximal ureterolith on the right and a large left nephrolith, meriting placement of a double-pigtail ureteral stent for renal pelvic lavage and immediate decompression of the right ureteral obstruction. A contralateral ureteral stent was placed prophylactically on the left side to prevent possible ureteral obstruction subsequent to medical dissolution. The right retroperitoneal peri-nephric abscess was percutaneously drained using ultrasound guidance with resolution of clinical sepsis occurring within 24 hours post-procedure. Continuing improvements in the severity of the hydronephrosis and hydroureter, and dissolution of the nephroureterolithiasis, were evident during follow-up examinations while monitored 2.5 years post-stent placement. Over that period, all clinical signs remained resolved other than multiple urinary tract infections that were successfully treated with antimicrobials. The nephrolith was no longer visible on survey radiographs 7 months into medical treatment. Ultimately, one of the ureteral stents was removed and a stent exchange was performed due to concern for chronic urinary tract infections. No recurrence of nephroureterolithiasis was noted. This is the first report documenting medical dissolution of proximal obstructive struvite ureterolith and massive nephrolith using a combination of ureteral stent decompression, dissolution diet, antibiotic therapy, and careful monitoring.

CANINE TRACHEAL COLLAPSE SYNDROME TREATED WITH ENDOLUMINAL STENTING: SHORT, INTERMEDIATE, AND LONG-TERM RESULTS IN 75 CASES (2009–2015)

Chick Weisse, The Animal Medical Center, NY, NY

The goal of this study was to describe outcomes for CTCS patients receiving tracheal stent placement at a single interventional radiology service. The authors' hypothesized associated clinical signs would be improved, complications would differ among those dogs with traditional versus malformation types of TC, and the presence of bronchial collapse would not have a significant impact upon outcomes.

Dogs undergoing tracheal stent procedures at the Animal Medical Center Interventional Radiology service from September 1, 2009, to August 3rd, 2015 were included.

75 patients qualified for inclusion in the study. CTCS type was classified as malformation in 51% and traditional in 49% dogs. Bronchial collapse was identified in 71%. There were no major intraoperative complications. Perioperative death occurred in 5 patients (7%).

Owners reported honking/raspy breathing scores improved in 89%, coughing scores improved in 44%, and dyspnea scores improved in 84%. A single stenting procedure was performed in 56%. Reasons for additional stenting procedures in 33 patients included major stent fracture (17%), obstructive tissue ingrowth (16%), progressive tracheal collapse (9%), and stent dislodgement during early intubation event (1%).

Mean and median survival times were 1035 and 848 days, respectively. Significantly prolonged survival times were associated with younger age, malformation TC type, and absence of perioperative pneumonia. Variables not associated with survival times included presence of bronchial collapse, or requirement for an additional stenting procedure.

Endoluminal tracheal stenting can provide a low mortality option for management of CTCS, however complications and restenting are not uncommon.

ENDOTRACHEAL WASH CYTOLOGIC AND MICROBIOLIC RESULTS IN DOGS UNDERGOING TRACHEAL STENTING

Clarke D, Luskin A, Brown D
Veterinary Hospital of the University of Pennsylvania, Philadelphia, PA

OBJECTIVE: To evaluate cytologic and bacterial culture results from dogs undergoing tracheal stenting.
STUDY DESIGN: Retrospective study.
ANIMALS: Fifty-six client owned dogs.
METHODS: Medical records were searched for dogs undergoing tracheal stenting between 2011 to 2015. Information regarding initial versus additional stent placement, emergent versus elective stenting, and thoracic radiograph results were evaluated. Fisher's exact testing was used to compare differences between patient groups.
RESULTS: During the study period, 38/46 (83%) dogs undergoing initial stent placement and 9/10 (90%) dogs undergoing additional stent placement had an endotracheal wash performed. Of the 47 dogs, 55% had positive aerobic cultures (19/38 (50%) initial stents and 7/9 (77.8%) re-stents). Thirty-eight (81%) dogs had cytology performed; 25/30 (83%) initial stents and 8/8 (100%) re-stents had cytologic evidence of inflammation. Of those, 24% had marked or suppurative inflammation. 89% (50/56) of dogs had thoracic radiographs within 48 hours of stenting; 58% (23/40) initial stent patients and 70% (7/10) re-stents had evidence of post-stenting pneumonia. Positive airway cultures were not associated with evidence of post-stenting pneumonia ($p = 0.179$), whereas inflammatory cytologic changes were ($p = 0.04$). 17/46 (37%) initial stents and 5/10 (50%) re-stents were placed emergently due to respiratory distress. There was no difference in the incidence of positive airway cultures in emergent versus non-emergent stents ($p = 1.00$).
CONCLUSIONS: Airway cytology and culture is important in dogs undergoing tracheal stenting, especially those having an additional stent placed. Of dogs undergoing tracheal stenting, 55% had positive bacterial cultures and 87% had cytologic evidence of inflammation.

EVALUATION OF PATIENT RADIATION EXPOSURE IN VETERINARY PROCEDURES UTILIZING INTRA-OPERATIVE FLUOROSCOPY: 360 CASES

Hersh-Boyle R[1], Culp W[2], Brown D[1], Luskin A[1], Reetz J[1], Agnello K[1], Chou P-Y[2], Clarke D[1]
[1] Veterinary Hospital, University of Pennsylvania, Philadelphia, PA
[2]Veterinary Medical Teaching Hospital, University of California-Davis

OBJECTIVE: To evaluate radiation exposure to small animals undergoing surgical and interventional procedures utilizing intra-operative fluoroscopy.
STUDY DESIGN: Retrospective study from two veterinary teaching institutions.
METHODS: Total radiation dose in milligrays and total fluoroscopy time in minutes were determined from dose reports obtained from four C-arms at two institutions. Feeding tube and catheter position assessments were excluded. Procedures were classified as vascular, urinary, respiratory, cardiac, gastrointestinal, and orthopedic. Fluoroscopy operators were classified as interventional radiologists, orthopedic surgeons, soft tissue surgeons, and cardiologists. The Kruskal-Wallis equality of populations rank test and Dunn's pairwise comparison were used to compare time and dose differences between procedures and between operators.
RESULTS: Between August 2012 and October 2015, 360 fluoroscopic procedures from two academic institutions were included. Urinary procedures comprised 41% of all procedures (148 cases). Vascular procedures had significantly longer fluoroscopy time (median 35.8 min, range = 0.6min – 84.7min) and significantly higher radiation dose (median 137mGy, range = 13mGy – 617.5mGy) than urinary, GI, orthopedic, cardiac, and respiratory procedures ($p = 0.001$). Trained interventional radiologists (16.1 mGy) and cardiologists (25.8 mGy) were associated with significantly higher radiation doses than any other operator ($p = 0.001$).
CONCLUSIONS: The expansion of minimally invasive procedures has increased the use of fluoroscopy, yet studies on radiation exposure to patients and operators are lacking in veterinary medicine. The current study shows that vascular procedures are associated with significantly longer fluoroscopic time and higher radiation dose than other evaluated procedures. Future studies should focus quantitative radiation monitoring, operator training, intra-operative safety measures, and post-operative patient monitoring protocols.

EVALUATION OF RADIATION EXPOSURE IN VETERINARY PATIENTS UNDERGOING FLUOROSCOPIC PROCEDURES: 360 CASES

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INTRODUCTION: The expansion of minimally invasive veterinary procedures has increased the use of fluoroscopy. Extensive studies in human medicine have investigated fluoroscopy radiation exposure, with emphasis on adverse patient effects and radiation safety. The purpose of this study is to evaluate the radiation exposure of small animal patients undergoing surgical and interventional procedures utilizing intra-operative fluoroscopy.

MATERIALS & METHODS: Total radiation dose in milligrays and total fluoroscopy time in minutes were determined retrospectively from dose reports obtained from four C-arms at two different teaching institutions. Feeding tube and catheter position assessments were excluded. Procedures were classified as vascular, urinary, respiratory, cardiac, gastrointestinal, and orthopedic. Fluoroscopy operators were classified as interventional radiologists, orthopedic surgeons, soft tissue surgeons, and cardiologists. The Kruskal-Wallis equality of populations rank test and Dunn's pairwise comparison were used to compare time and dose differences between procedures and operators.

RESULTS: Between August 2012 and October 2015, 360 fluoroscopic procedures from two academic institutions were included. Urinary procedures comprised 41% of all procedures (148 cases). Vascular procedures had significantly longer fluoroscopy time (median 35.8 min, range = 0.6min – 84.7min) ($p = 0.001$) and significantly higher radiation dose (median 137mGy, range = 13mGy – 617.51mGy) than urinary, GI, orthopedic, cardiac, and respiratory procedures. Trained interventional radiologists (16.1 mGy) and cardiologists (25.82 mGy) were associated with significantly higher radiation doses than other operators.

CONCLUSION: Vascular procedures are associated with significantly longer fluoroscopic time and higher radiation dose than other evaluated fluoroscopic procedures. Future studies should focus on quantitative radiation monitoring, operator training, intra-operative safety, and patient monitoring protocols.

FLUOROSCOPIC-GUIDED BRONCHOALVEOLAR LAVAGE (F-BAL) FOR SAMPLING THE LOWER AIRWAYS OF CATS

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Objective: To describe the use of fluoroscopic guided bronchoalveolar lavage (F-BAL) in cats.
Animals: Group 1: Twelve research cats deemed healthy based on normal blood work, fecal tests and thoracic radiographs. Group 2: Following client consent, two client-owned cats with lower respiratory tract disease (focal (1) and diffuse (1) on radiographs) were enrolled.
Methods: Under general anesthesia, patients were intubated and a 0.035" hydrophilic standard weasel wire was used to fluoroscopically guide an 8Fr red rubber catheter into lung lobes of interest. For group 1 cats, catheterization and bronchoalveolar lavage (BAL) was performed in the caudal lung lobes. For group 2 cats, catheterization of all lung lobes was attempted and BAL was performed in the most radiographically affected lung lobes. BAL was performed by infusing two 5mL sterile saline aliquots which were aspirated with a 20cc syringe. BAL fluid obtained was submitted for cytologic analysis and bacterial culture. Cytologic quality was evaluated using a semi-quantitative scale and complications were recorded.
Results: The right middle (2/2), right caudal (14/14), accessory (2/2), left cranial (2/2) and left caudal lung fields (14/14) were successfully catheterized. F-BAL failed at sampling the right cranial lung lobe in 2/2 patients. Samples obtained were of excellent cytologic quality. Culture was positive for Pasteurella for one cat (group 2), negative for 13 cats. The only complication recorded was transient hemoglobin desaturation.
Conclusions & Clinical Relevance: F-BAL may be a practical, reliable and safe technique to sample all lung lobes except for the cranial lung lobe in cats.

ANGIOGRAPHIC VERSUS ECHOCARDIOGRAPHIC MEASURES OF PULMONARY VALVE DIAMETER IN DOGS WITH CONGENITAL PULMONARY VALVE STENOSIS

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Objective: To compare two techniques for measuring the pulmonary valve annulus in dogs with pulmonary valve stenosis (PS) prior to balloon pulmonary valvuloplasty (BPV).
Study Design: Retrospective study design from stored images.
Animals: Forty dogs with PS.
Methods: Pulmonary valve diameter was measured on echocardiography performed within 24hrs of BPV at the onset of systole, at end-systole, and at end-diastole. Measurements from 5 cardiac cycles were obtained and averaged. Digitally-stored angiograms obtained during BPV were evaluated to determine the angiographic pulmonary valve diameter. The right ventriculogram was digitally calibrated to an esophageal marker catheter within the image or, rarely, to the angiographic catheter. The pulmonary valve diameter was then measured at the same time points as for echocardiography.
Results: The median peak instantaneous pressure gradient across the pulmonary valve by echocardiography was 110 mmHg (range, 40 to 268 mmHg). Echocardiographic estimates of pulmonary valve diameter were well correlated to angiographic measurements with an r value of 0.99 at the onset of systole, 0.98 at end systole, and 0.99 at end diastole ($P < 0.0001$ for all comparisons). There was minimal bias between methods, the 95% limits of agreement between angiography and echocardiography were approximately ± 1 mm, and intra and interobserver variability for all measurements were acceptable.
Conclusions: Either imaging modality can be used to measure the pulmonary valve diameter for balloon sizing prior to BPV in dogs with PS. An echocardiographic measurement would be unlikely to predict a different balloon size than a measurement obtained via angiography.

SCIENTIFIC ABSTRACTS/COOL CASES - Posters

EARLY DIAGNOSIS OF TRANSITIONAL CELL CARCINOMA OF THE URINARY BLADDER DURING PERCUTANEOUS CYSTOLITHOTOMY IN A DOG.

Stephanie Reabel, Brigitte A. Brisson, Lisa Melville, Katie Hoddinott, Danielle Richardson. Department of Clinical Studies, Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada, N1H 6H9.

A 10-year-old poodle cross with a history of intermittent hematuria presented for percutaneous cystolithotomy (PCCL) after confirmed recurrence of calcium oxalate cystic calculi. During exploration of the urinary bladder and proximal urethra by PCCL, a 2 mm x 4 mm, irregularly shaped, minimally raised, plaque-like mucosal lesions was identified on the dorsal aspect of the trigone near the proximal urethra. The grossly visible lesion was removed by obtaining 2 consecutive biopsies using a 5Fr cup biopsy forceps and samples were submitted for histopathology which was consistent with transitional cell carcinoma (TCC) of the urinary bladder neck. Staging was performed and was normal. Meloxicam and chemotherapy were initiated. Mitoxantrone was initiated but was discontinued after 3 doses due to recurrent neutropenia. Carboplatin was then administered but had to be discontinued after 3 doses due to bone marrow suppression. The patient continued to do well and showed no evidence of progression or recurrence of disease clinically and sonographically 20 months after diagnosis. Early diagnosis and treatment of TCC without long-term recurrence is reported.

CYSTOSCOPIC GUIDED LASER ABLATION OF A DORSOVENTRAL BLADDER ADHESION POST CYSTOTOMY IN A FEMALE DOG.

Brett Harling, Meghan Kirsch, Allyson Berent, Chick Weisse, The Animal Medical Center, NY, NY.

An approximately 8 year female spayed Yorkshire Terrier Poodle Cross, who had a cystotomy performed for calcium oxalate stones 5 weeks prior, was presented for continued pollakiuria, inappropriate urination, and stranguria since the time of surgery. The past pertinent history included the diagnosis of calculi incidentally at the time of surgical correction of a left grade III/IV medially luxating patella. The patient also had a history of intermittent hematuria and pollakiuria and was diagnosed and treated for an *E. coli* urinary tract infection 8 months prior to the cystotomy. Radiographs taken prior to cystotomy revealed two irregularly marginated, jagged appearing cystic calculi approximately 6 mm in diameter. A traditional cystotomy was elected and two cystoliths were removed via a bladder spoon and confirmed to be calcium oxalate dihydrate on analysis. The urinary bladder was closed in a single layer using 4-0 PDS suture in a simple interrupted suture pattern and both the procedure and patients recovery were noted to otherwise be unremarkable. A sample of bladder mucosa and stone were submitted for culture and were negative for aerobic bacterial growth.

At a recheck 12 days post-operatively, the patient was noted to have persistent increased urgency to urinate with inappropriate urination since the cystotomy, and was empirically prescribed a broad spectrum antibiotic without a noted change in clinical signs. A subsequent abdominal ultrasound revealed thickening of the ventral and dorsal urinary bladder wall at the level of the cystotomy site, with a soft tissue band visualized to be connecting the dorsal and ventral wall as thick as 2 cm in a para-saggital plane. A sterile urine culture was negative for bacterial growth. This was reassessed 2 weeks later and was persistent. At this time a cystoscopy was pursued which confirmed a fibrous adhesion connecting the dorsal and ventral bladder mucosa at the site of the previous suture line creating 2 cavities within the urinary bladder. This tissue was cystoscopically ablated using the Holmium:YAG laser at 10Watts. Post-operatively, the patient was placed on a short, tapering anti-inflammatory dose of steroids, prazosin, and a short course of a broad spectrum antibiotic. At the two week recheck the ultrasound confirmed resolution of the band and the bladder looked nearly normal with a slight thickening at the ventral suture line but the patient's signs persisted. A this time oxybutynin was initiated to treat for a hyper spastic bladder. Within three days of beginning this medication, the episodes of stranguria resolved with noted improvement in pollakiuria.

This case introduces an atypical presentation of a complication of cystostomy with a minimally invasive endourological treatment. It also provides rationale for use of minimally invasive removal of cystic calculi with recommendations for potentially less reactive, more rapidly absorbable suture to decrease local irritation and recurrence of suture associated cystolith formation. Percutaneous cystolithotomy (PCCL) allows for a less trauma with smaller incisions, basketing for removal of cystoliths without invoking mucosal denuding secondary to trauma induced from bladder spoons, and confirmation of removal of all stone and sediment with direct visualization using rigid and flexible cystoscopy with decreased hospitalization time and similar cost to client.

CLINICAL CASE OF PROSTATIC ADENOCARCINOMA IN A MALE CAT.

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A cat of 7years with symptoms of urinary retention during the day and lack of defecation for the last 5 days has been at the consultation. It is known that at the age of 5 years the patient underwent a perineal urethrostomy due to obstruction with sand. Absence of urethrostomy stenosis was confirmed during the initial examinaltion. A tissue that completely blocked the lumen of the urethra was identified at 3cm from urethrostomy. The tissue biopsy was taken. Due to the major changes in the anatomy of the urethra and the danger of perforation of the wall, it was decided to carry out catheterization of the bladder under fluoroscopic control. During retrograde cystography, the heterogeneity of the contrast column, the abnormal curvature of the urethra and the presence of tumor in the lumen of the urethra were identified. During the urethra fluoroscopy, hydrophilic 0.018 inch wire was inserted into the cavity of the badder bypassing the tumor tissue. The urinary catheter was entered through the wire into the bladder. The owners were recommended to place a urethral stent. The owners made a decision of conducting euthanasia. Significant volume of tumor tissue affecting the prostate gland and growing into the submucosal layer of the rectal wall was identified during necropsy. Morphology study confirmed adenocarcinoma of the prostate.

ACUTE PORTAL HYPERTENSION FOLLOWING COIL EMBOLIZATION IN A DOG WITH AN INTRAHEPATIC PORTOSYSTEMIC SHUNT.

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A 5-month old female spayed Miniature Pinscher was diagnosed with a right division intrahepatic portosystemic shunt and treated with percutaneous transjugular and transfemoral coil embolization. The dog was initially prepared and positioned in dorsal recumbency for routine transjugular percutaneous coil embolization. During deployment of the initial 6 x 8mm coil, acute portal hypertension developed in which the portal pressure increased from 6 to 24 mmHg. A commensurate increase in heart rate from 120 to 140 beats per minute was also identified. A snare was used to extract the coil from the shunt but in the process displaced the caudal end of the stent into the shunt. The portal pressure and heart rate returned to baseline following coil extraction.

The right femoral vein was accessed with an introducer sheath and attempts to reposition the stent into the caudal vena cava with a snare failed. Ultimately, through and through access from the jugular sheath to the femoral sheath was obtained for placement of a second caval stent and deployment of 3 smaller (3 x 4mm) coils. Final portal pressure was 12 mmHg and the dog was recovered uneventfully from the procedure. The dog is reportedly alive and doing well 28 months following the procedure.

UNSUCCESSFUL TROUBLESHOOTING POSITION OF A SHORT URETERAL STENT AFTER ENDOSCOPIC PLACEMENT FOR TCC

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A 6 year old male neutered Golden Retriever was presented with hematuria. Two months prior to presentation, a right nephrectomy had been performed due to a papillary renal carcinoma. Upon presentation, an abdominal ultrasound revealed a mass-effect in the bladder. It was not clear whether this was due to a mass or a hematoma. Cystoscopy and a contrast cystogram revealed a large mass within the trigone of the bladder. The left ureteral opening was enclosed by the trigonal mass. An 0.035 weasel wire was passed into the left ureter with the aid of fluoroscopy and flexible cystoscopy. A measuring catheter was used to measure the length from the renal pelvis to the UVJ (ureteral vesicular junction). A 7Fr ureteral sheath was passed and a 6 Fr x 23 cm cancer ureteral stent was deployed after a pyelogram had been performed. Initially, on fluoroscopy, the ureteral stent appeared to have been deployed in the trigone distally. However, further evaluation via cystoscopy determined that the ureteral stent was in the distal ureter. Biopsy graspers, stone baskets, and a loop snare were unsuccessful in pulling the stent distally. Subsequently, another 0.035 weasel guidewire was passed within the 7 Fr sheath. Once the coiled in the renal pelvis, the sheath was removed. A 7 Fr balloon ureteral catheter was passed through the second guidewire. The ballon was inflated proximally to the distal pigtail of the ureteral stent with 50:50 contrast and saline. Once inflated, the balloon catheter was pulled distally. This was attempted several times unsuccessfully as the balloon portion of the ureteral catheter would slide passed the distal pigtail of the ureteral stent. Unfortunately, the ureteral stent remained in the distal ureter. We suspect that our inability to pull the stent distally was partially due to the fact that the renal pelvis was not dilated and hydrophilic properties of the stent and ureteral catheter. The lack of pyelectasia or hydronephorosis was due to the lack of a ureteral obstruction.

The failure in appropriately placing the ureteral stent in this dog was due to the underestimation of the length necessary for the ureteral stent. There aren't commercial veterinary 6Fr ureteral cancer stents that are long enough for large dogs. Retrospectively, we should have either placed a 4.7 Fr x 20-30 cm ureteral stent or used a human 6Fr x 22-33 cm ureteral in this dog instead of risking having a short ureteral stent. Ultimately, this dog was euthanized 1 month later due to severe hematuria.

HOLMIUM: YAG LASER ABLATION OF A TRACHEAL STRICTURE IN AN AFRICAN GREY PARROT

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A 9-year old suspected male Congo African Grey presented for emergency evaluation of increased respiratory rate and effort and inspiratory stridor. Despite initial response to supportive care with oxygen, doxycycline, and meloxicam, he had progressive respiratory distress and open mouth breathing. The bird was anesthetized for placement of a right air sac cannula and tracheoscopy which showed an almost complete occlusion of the trachea approximately 3cm distal to the glottis. CT performed two days later showed an abrupt narrowing of the tracheal lumen due to a band of soft tissue traversing the trachea with a broad based attachment along the dorsal tracheal wall consistent with a stricture. Given the focal nature of the stricture, the decision was made to perform laser ablation of the stenotic tissue. Using injectable anesthetics and 21% medical air insufflation through the air sac cannula, a 200 micron Holmium: YAG fiber was advanced into the working channel of the rigid cystoscope and sheath. Initial settings of 5 W, 0.5 J were used, but had to be increased to 8 W, 0.7 J to facilitate ablation of the stricture. The stricture was opened to near full tracheal diameter. The bird recovered well, and had his air sac cannula removed 4 days later. He did well for 8 months until he developed recurrence of clinical signs. The air sac cannula was replaced, with the intention of repeat laser ablation, but the patient suffered cardiopulmonary arrest during air sac cannula placement and could not be resuscitated.

EVALUATION OF DIFFERENT ENDOTRACHEAL TUBE POSITIONS AND PEAK AIRWAY PRESSURES ON MAXIMAL TRACHEAL DIAMETER MEASUREMENTS IN DOGS UNDERGOING TRACHEAL STENTING

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OBJECTIVE: To evaluate different endotracheal tube positions and peak airway pressures on maximal tracheal diameter measurements.
STUDY DESIGN: Retrospective study.
ANIMALS: Fifteen dogs undergoing tracheal stenting.
METHODS: Medical records were searched for dogs undergoing stenting from January 2014 to January 2016. Cases that had maximal tracheal diameter measurements performed at airway pressures of 20cm and 30cm H_2O were included. Measurements were obtained with the endotracheal tube positioned at the thoracic inlet for maximal intrathoracic diameter, caudal cervical trachea for maximal thoracic inlet diameter, and the larynx for maximal cervical diameter. Agreement between measurements at both airway pressures was evaluated using Bland-Altman plots and calculation of Lin's concordance correlation coefficient. The weighed kappa statistic was used to assess agreement of stent size selection at different airway pressures.
RESULTS: Maximal tracheal diameter measured in the cervical, thoracic inlet, and intrathoracic regions using 20cm versus 30cm H_2O peak airway pressures had a concordance correlation coefficient of 0.95, 0.94, and 0.90, respectively. There was 93.3% agreement (kappa 0.87) of stent choice based on measurements made at 20cm and 30cm H_2O.
CONCLUSIONS: Positioning the endotracheal tube near the desired area being measured may support the dorsal tracheal membrane and minimize the movement needed to achieve maximal airway diameter and therefore eliminate the need for higher airway pressures. At peak airway pressures of 20 and 30cm H_2O, maximal tracheal diameter measurements at each location were highly concordant. The agreement of stent choice based on maximal diameter measurements did not suggest that stent size selection would differ based on the two airway pressures.

THE USE OF GASTRODUODENAL ARTERY COIL EMBOLIZATION TO FACILITATE INTRA-ARTERIAL BLAND EMBOLIZATION OF NON-RESECTABLE BENIGN HEPATIC NEOPLASIA IN TWO SMALL DOGS

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An 11-year old castrated male Miniature Pinscher (dog 1) and a 12-year old spayed female Chinese Crested (dog 2) were evaluated for surgically non-resectable central and right liver masses, respectively. Both dogs had liver masses diagnosed ultrasonographically after presenting for vomiting and being found to have elevated ALT, ALKP, and GGT. The dogs underwent exploratory laparotomies, with both masses adhered to the vena cava, as well as to the diaphragm in dog 1 and portal vein in dog 2. Histopathology confirmed benign hepatoma in dog 1 and hepatocellular adenoma in dog 2. Both dogs underwent computed tomography with angiography (CTA) that showed arterial blood supply to the masses originating from the right hepatic artery. Access to the right hepatic artery was performed routinely for each patient. In both dogs, the arterial supply for each mass was too small for superselective catheterization, with the most distal catheterization possible still concerning for flow or reflux into the gastroduodenal artery (GDA). The GDA was occluded with two 2mm x 2cm platinum microcoils in dog 1 and two 3mm x 1cm platinum microcoils in dog 2. GDA occlusion was confirmed and bland embolization of the hepatic masses with 100-300 micron polyvinal alcohol (PVA) microspheres was performed to near stasis. After embolization, the right femoral arteries were ligated and both dogs recovered without complication. Both dogs had ultrasonographically diagnosed stable disease at last recheck. Both dogs are still alive (1063 days post-procedure for dog 1 and 553 days post-procedure for dog 2).

POLYVINYL ALCOHOL PARTICLE AND ONYX EMBOLIZATION OF A PHARYNGEAL HEMARTOMA CAUSING UPPER AIRWAY OBSTRUCTION IN A DOG

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A 12-year old male castrated Yorkshire Terrier was evaluated for a right sided pharyngeal mass causing upper airway stridor and intermittent obstruction. The mass was incidentally noted 1.5 years prior to presentation during intubation for dental prophylaxis. CT angiography (CTA) revealed a vascularized mass centered at the right thyroihyoid with associated mass effect on the pharynx/larynx and right lateral basihyoid osteolysis. Histopathology was consistent with a benign vascular hemartoma. Intermittent hemorrhage into the mass was thought to be causing the airway obstruction. Embolization was elected since carotid ligation provided temporary cessation of bloodflow to the non-resectable mass. The right carotid artery was catheterized via right femoral artery access. To prevent non-target embolization, two 2mm x 2cm platinum microcoils were placed in each the internal carotid, lingual, facial, maxillary, and external carotid arteries distal to branch of the right pharyngeal artery supplying the mass. Embolization with 200-355 polyvinyl alcohol (PVA) Contour particles was performed into the pharyngeal artery branch supplying the mass followed by right femoral artery ligation. The patient's respiratory effort and stridor were markedly improved at his one week recheck. Five months later the patient had recurrence of stridor. Intra-arterial embolization via the left femoral artery was performed with 0.3mL Onyx-18 until complete stasis of the arterial branches supplying the mass. The pharyngeal mass did not change in size and he had minimal stridor for 1 year until he developed thoracic carcinomatosis and pleural effusion. The dog was treated with chemotherapy for 15 months before being euthanized.

TRANSPLENIC COIL EMBOLIZATION OF AN INTRAHEPATIC PORTOSYSTEMIC SHUNT IN A DOG

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A 6 month old intact female Golden Retriever was presented with a central divisional intrahepatic portosystemic shunt (IHPSS) confirmed with a dual phase computed tomography (CT) angiogram. Percutaneous transjugular coil embolization was attempted. During the procedure, initial portal pressure measured 15 mmHg, and central venous pressures measured 9 mmHg. Placement of a self-expanding metallic nitinol caval stent was performed uneventfully with fluoroscopic guidance. After stent placement, a high portal pressure (19 mmHg) was measured. No thrombogenic coils were placed at that procedure. At 20 weeks post-procedure the dog developed abdominal effusion, the albumin and BUN concentrations decreased, and the dog was intermittently exhibiting dull mentation. A laparotomy was performed for ovariohysterectomy, and a transplenic approach to the IHPSS was elected. Utilizing the Seldinger technique a 6 Fr vascular sheath was placed through the splenic parenchyma and into the splenic vein. The IHPSS was selected via fluoroscopic guidance, and portal pressures were measured at 11 mm Hg. Two thrombogenic stainless steel coils were placed, at which time the portal pressures were measured at 16-17 mm Hg. The vascular sheath was removed from the splenic parenchyma, and a single cruciate suture was placed in the splenic parenchyma for hemostasis. The dog recovered uneventfully. At 1 year post-procedure the dog receives no medical therapy, except for omeprazole, and is clinically normal.

DELAYED SUBCUTANEOUS URETERAL BYPASS PLACEMENT FOR TREATMENT OF TRAUMA-INDUCED URETERAL OBSTRUCTION IN A CAT

Buote NJ, Peterson NW. VCA West Los Angeles, Los Angeles, CA

A 6 year old female spayed Singapura presented to the hospital after an unknown traumatic event. On initial physical exam she was quiet, hypothermic (92.8°F), 10% dehydrated, a grade II/VI systolic heart murmur was ausculted, mucous membranes were pale and poor peripheral pulses. There was a hematuria and ecchymosis noted on the ventral abdomen. The patient was hypotensive, anemic and hyperlactetemic on initial diagnostics with significant fluid accumulation in the retroperitoneal space. The patient was stabilized with a blood transfusion and supportive care overnight. An intravenous pyelogram was performed the following day and revealed no evidence of ureteral tear or obstruction but decreased flow through the left ureter. The patient was discharged the following day with pain medication and instructions to reassess in 5-7 days. The patient represented two days later for anorexia, lethargy and continued hematuria. Ultrasound at this time identified pyelectasia and large hematoma in the urinary bladder with mild azotemia. Patient was taken to surgery the following day after supportive care normalized the azotemia and a SUB was placed in the left kidney. At surgery an antegrade pyelogram confirmed obstruction of the left ureter. A very large formed hematoma was removed from the urinary bladder. At last recheck the patient was non-azotemic, hematuria had resolved and she was clinically normal.