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4TH ANNUAL MEETING SQUAW VALLEY CALIFORNIA MAY 1-3RD 2019

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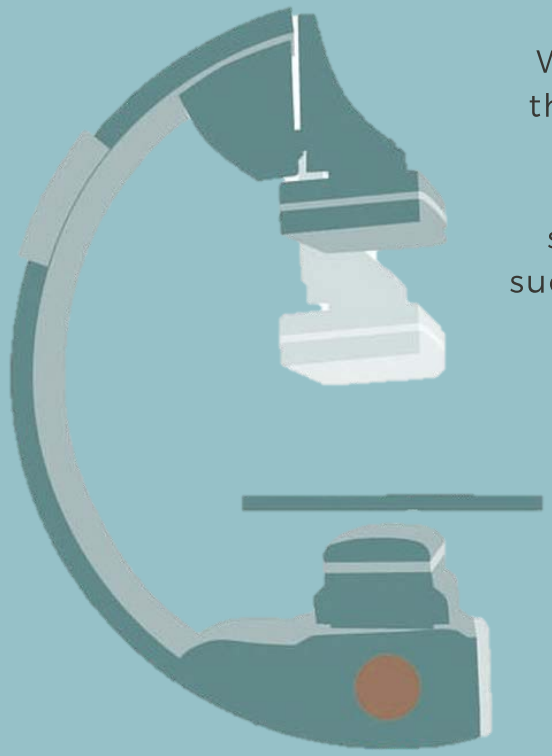

We would like to thank all of you for attending this 4thAnnual meeting. We are very excited to share cutting edge breakthroughs, and great networking opportunities in a wonderful setting. Thank you for making this meeting a success and for your continued support of VIRIES.

Marilyn Dunn

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DANIEL PICUS, MD, FSIR, FACR

KEYNOTE LECTURER

Daniel Picus, M.D., FSIR, FACR is professor of radiology and surgery at the Mallinckrodt Institute of Radiology (MIR) at Washington University School of Medicine, St. Louis, where he is also senior vice-chair for special projects.

Dr. Picus has a current interest in coding and reimbursement. He is a member of the American Medical Association's Current Procedural Terminology (AMA CPT) Editorial Panel. He previously served on the AMA CPT Assistant Editorial Board as well as serving as the American College of Radiology's (ACR's) CPT advisor. Dr. Picus' academic interests are primarily in the percutaneous management of biliary disease, as well as the treatment of patients with pulmonary arteriovenous malformations. He has authored more than 130 peer-reviewed publications, as well as multiple text book chapters and scientific exhibits. Dr. Picus has served SIR in multiple roles. He served as both Education and Annual Meeting Councilor on the SIR Executive Council and was the first editor of the Society of Cardiovascular and Interventional Radiology (SCVIR, now SIR) newsletter. He was the first deputy editor of the Journal of Vascular and Interventional Radiology and from 1995–2000 served as its second editor-in-chief. He is a Fellow of SIR, ACR and the American Heart Association (AHA). He delivered the Dr. Charles T. Dotter Lecture at the 2013 SIR Annual Scientific Meeting.

Dr. Picus graduated from the University of Chicago School of Medicine in 1981 and began his 37-year career at MIR. There he completed his radiology residency, followed by a fellowship in abdominal imaging. He did a second vascular and interventional radiology fellowship at the Alexandria (Va.) Hospital with Barry T. Katzen, MD, FSIR, and Arina Van Breda, MD, FSIR. In early 1986, Dr. Picus was chosen to lead MIR's newly established interventional radiology section. Initially, it consisted of just two faculty members, Dr. Picus and SIR 2018–19 President M. Victoria Marx, MD, FSIR. At MIR, Dr. Picus has received both the Teacher of the Year and the Washington University Distinguished Clinician Awards.

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4TH ANNUAL MEETING SCHEDULE MAY 1-3RD 2019

WEDNESDAY

1:00-1:30	Welcome address and vendor introduction
1:30-1:50	Vachon Removal of lower urinary tract stones by PCCL (2012-2017)
1:50-2:00	Park Laser ablation for ectopic ureterocoeles and vaginal/urethral septum
2:00-2:20	Wuillemin Outcome of SUB placement for benign ureteral obstruction in 82 cats
2:20-2:30	Allen SUB placement for bilateral ureteral obstruction and perinephric pseudocyst
2:30-2:50	Chik Use of tEDTA for treatment of SUB mineralization in cats
3:00-3:40	COFFEE BREAK
3:40-3:50	Watkins Removal of bladder TCC with a pediatric retroscope in a dog
3:50-4:00	Llido Findings in transurethral cystoscopy in dogs with recurrent UTI (2011-2018)
4:00-5:00	Keynote Lecturer Dr. Picus Endourology
5:00-5:30	Roundtable Endourology Picus, Dunn, Berent
6:00 PM	GALA DINNER

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4TH ANNUAL MEETING SCHEDULE MAY 1-3RD 2019

THURSDAY

7:00-8:00	Keynote Lecturer Dr. Picus Hepatobiliary (Breakfast)
8:00-8:30	Berent Endoscopic retrograde cholangiography for extrahepatic biliary obstruction
8:30-8:40	Thompson Percutaneous transhepatic cholecystotomy for extrahepatic obstruction
8:45-9:45	Roundtable Hepatobiliary Picus, Thompson, Berent
9:45-10:15	COFFEE BREAK
10:15-10:20	Chang Modified percutaneous coil embolization for intrahepatic portosystemic shunt in a dog
10:20-10:30	Serrano Stenting and angioplasty of left iliac thrombosis in a dog
10:30-10:50	Culp Percutaneous transvenous embolization for intrahepatic portosystemic shunt in cats
10:50-11:05	Scansen 3D map guidance for percutaneous embolization of intrahepatic portocaval shunts
11:05-11:15	Case Hybrid embolization and ligation of a hepatic AVM visualised with 3D printing
11:20-12:00	Roundtable PSS/AVM Scansen, Culp, Case
12:00-1:00	LUNCH
1:00-1:20	Culp Novel drug embolic microsphere for non-resectable liver neoplasia in dogs
1:20-1:40	Weisse Drug eluting bead chemoembolization for incompletely resectable HCC in dogs
1:40-1:50	Clarke Acute tumor lysis syndrome after intra-arterial embolization of HCC
1:50-2:00	Clarke Maintained olfatory ability after maxillary arterial embolization in a police dog with Scott's Sydrome
2:00-2:10	Culp Use of EVOH (ONYX®) for intracranial AVM in a dog
2:10-2:20	Asano TACE for large RCC with pulmonary metastasis
2:20-2:35	Griffin Suspected contrast induced nephropathy in 3 patients after IR procedures
2:35-2:50	Pierce Radiation dose during cardiac IR. Portable C-arm vs new fluoroscopy system
3:00-3:40	COFFEE BREAK
3:40-4:30	Roundtable TACE/EMBO Clarke, Culp, Weisse
4:30-5.00	ANTON LAPSHIN MEMORIAL
5:00 PM	COCKTAIL RISTORANTE MONTAGNA

4TH ANNUAL MEETING SCHEDULE MAY 1-3RD 2019

FRIDAY

7:00-8:00	BREAKFAST (Meeting starts at 7:30)
8:00-8:05	Gallagher Survey evaluation of endoscopic techniques for esophageal/gastric foreign body
8:05-8:10	Palm Fluoroscopic guided use of an endovascular snare system for urinary tract FB
8:10-8:15	Swanson Fracture and retrieval of ureteral catheter during ureteroscopy in a dog
8:15-8:30	Griffin Percutaneous radiography-guided gastrotomy tubes
8:30-8:40	Gallagher Biochemical comparison of 2 percutaneous gastropexy techniques for gastrotomy tubes
8:40-8:45	Lux IRH in a 3 month old Labrador
8:45-8:50	Serrano IR management of a paraoesophageal mediastinal abscess
9:00-9:40	COFFEE BREAK
9:40-10:00	Weisse Prognosis following multimodal treatment for tracheal collapse in 84 cases
10:00-10:05	Lopez Fracture of 2 different shaped tracheal stents
10:05-10:25	Weisse Bacterial infection in canine tracheal collapse prior, during and after stenting
10:25-10:35	Gibson Long term resolution of a chylothorax secondary to RA mass
10:35-10:50	Gibson Fluoroscopic guidance for intrathoracic drainage catheters
11:00-12:00	Roundtable Respiratory Weisse, Gibson and Lopez
12:10-12:40	CLOSING REMARKS

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5th ANNUAL MEETING

13-14-15 May 2020

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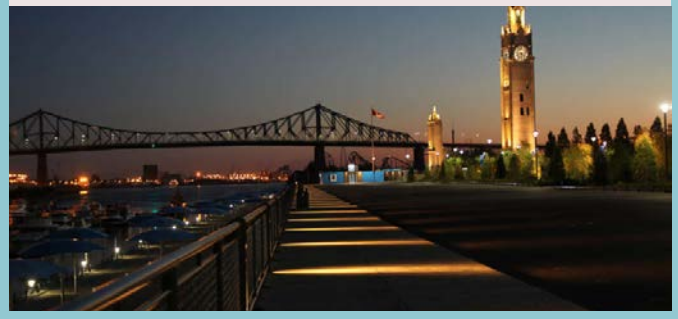

REMOVAL OF LOWER URINARY TRACT STONES BY PERCUTANEOUS CYSTOLITHOTOMY: A CASE SERIES BETWEEN 2012 AND 2017

Cruciani B, Vachon C, Dunn M
Clinical studies, Veterinary Hospital of the University of Montreal, St-Hyacinthe, Quebec, Canada

Objective: Describe the use and outcome the use percutaneous cystolithotomy for removal of urethral and bladder stones in dogs and cats.
Study design: Retrospective case series.
Animals: Seventy-five client-owned dogs and cats that underwent percutaneous cystolithotomy.
Methods: Records were reviewed and analyzed for dogs and cats that underwent percutaneous cystolithotomy between 2012 and 2017. Signalment, clinical presentation, laboratory and imaging data, procedure time, use of lithotripsy, biopsy, perioperative and immediate postoperative complications, hospitalization times, stone composition and urine culture results were recorded. Owners were contacted by phone or email 3 weeks following the procedure. Follow-up communications with the owner and referring veterinarian were also recorded.
Results: 78 percutaneous cystolithotomy procedures were performed on 59 dogs and 16 cats. Eight of these procedures were associated with placement of a subcutaneous ureteral bypass for ureteral obstruction. The median duration of the procedure was 95 min (45-420) and lithotripsy was required in 3% of cases (2/78). Complications during the procedure were reported in one case and, in 4% of cases (3/78), remaining uroliths were suspected on postoperative radiography.83% (58/70) of patients were discharged within 24 hours of the procedure. 23% of patients (16/70) reported clinical signs related to the lower urinary tract in the 3 week postoperative period.. Long term follow-up in patients revealed stone recurrence in 21% of cases (7/33).
Conclusion: Percutaneous cystolithotomy allows optimal removal of bladder and urethral stones as well as rapid postoperative recovery with few peri and postoperative complications.

USE OF CYSTOSCOPIC-GUIDED LASER ABLATION FOR TREATMENT OF BILATERAL ECTOPIC URETEROCOELES, A VAGINAL SEPTUM, AND A URETHRAL SEPTUM IN A FEMALE DOG

Park S., Burdick S.
Red Bank Veterinary Hospital, Tinton Falls, NJ.

A 10 month old female spayed Labrador retriever was referred with a history of urinary incontinence and recurrent urinary tract infections from the time of weaning. At the time of consult, physical examination was unremarkable other than a hooded vulva and urinary incontinence witnessed during evaluation. Abdominal ultrasound demonstrated severe bilateral renomegaly, pyelectasia, and ureteral distention. The patient was anesthetized for lower urogenital tract endoscopy with fluoroscopic assistance. Initial endoscopic evaluation of the vestibule demonstrated a vestibulovaginal septal remnant and two ventral orifices. The larger ventral orifice led to the urinary bladder, revealing this as the urethral opening. Evaluation of the bladder via this opening demonstrated severely distended, bilateral ureterocoeles, with ectopic ureteral orifices visualized distal to the neck of the bladder. The smaller ventral orifice was also observed to be contiguous with the bladder; the tissue separating the two ventral urethral orifices was thus identified as a urethral septum spanning the majority of the length of the urethra, resulting in urethral duplication. Under endoscopic guidance, a 600micron holmium:YAG laser fiber was used to ablate the entirety of the vaginal septum; both ectopic ureterocoeles to the level of the orthotopic ureteral openings; and the entirety of the urethral septum. Followup demonstrated complete resolution of her clinical signs following additional treatment of a urinary tract infection. This is the first reported case of urethral duplication in a female dog, which was successfully corrected using a minimally invasive method of laser ablation.

OUTCOME OF SUBCUTANEOUS URETERAL BYPASS DEVICE PLACEMENT AS A TREATMENT FOR BENIGN URETERS OBSTRUCTION IN CATS: 82 CASES (2012-2018)

Wuillemin F, Vachon C, Dunn M.
CHUV, Veterinary Hospital of the University of Montreal, St Hyacinthe, Québec, Canada

Introduction: Benign ureteral obstructions are increasingly recognized in cats and can represent a therapeutic challenge. The purpose of this retrospective study was to determine the outcome and complications associated with placement of SUB devices in cats.

Material and methods: Medical records of cats with benign ureteral obstruction confirmed by intraoperative antegrade pyelogram and treated by placement of a SUB between 2012 to 2018 were reviewed. Outcome and complications were documented.

Results: A total of 82 cats and 113 kidneys were treated by placement of a SUB device. Median age at placement was 9 years. Median serum creatinine on admission and at the time of discharge were 472umol/L (5.3mg/dL) and 180umol/L (2.0mg/dL), respectively. Postsurgical complications (≤ 7 jours) included device occlusion with blood clots 8% [7/82], sterile cystitis 7% [6/82] and kinking of the device 5% [4/82]. 94% (77/82) of cats were discharged from hospital. The most common long term complications included obstruction of the device 23% [26/113] due to mineralization 15% [17/113] or a kink 8% [9/113]. Surgery was required to exchange the SUB device in only 65% (17/26) of the obstructed cases. At the time of the study 43% (37/82) of cats were alive. Amongst those who died, 30% (12/40) died because of renal associated disease.

Conclusion: This study suggests that SUB device placement is associated with good outcome and should be considered for the treatment of benign ureteral obstructions in cats.

SUBCUTANEOUS URETERAL BYPASS PLACEMENT FOR TREATMENT OF BILATERAL URETERAL OBSTRUCTION AND CONCURRENT PERINEPHRIC PSEUDOCYSTS

Allen EC, Burdick S
Red Bank Veterinary Hospital, Tinton Falls, NJ

A 3 year old male castrated Highland Lynx cat was presented for a two week history of progressive lethargy and abdominal distension. Initial blood work revealed a mild anemia, low total protein, and moderate azotemia (creatinine 3.78 mg/dL). Computed tomography of the abdomen showed bilateral pelvic dilation up to 2.6 cm. Surrounding each kidney were thin-walled, non-contrast enhancing, fluid-filled structures (L:12.9 x 10.8 cm, R: 2 x 2.7 cm) compatible with perinephric pseudocysts. Aspiration of fluid within the structures was inconsistent with urine. The patient was anesthetized and intraoperative antegrade pylography confirmed bilateral ureteral obstruction at the ureteropelvic junction. A right-sided subcutaneous bypass system was placed using standard technique without resection of the associated pseudocyst owing to its smaller size. A left-sided subcutaneous bypass system was placed via standard technique following resection of a majority of the wall of the associated pseudocyst. The portion of the wall adhered to the renal capsule was not removed prior to placement of the nephrostomy catheter owing to bleeding with attempted dissection. Histopathologic evaluation was consistent with a perinephric pseudocyst. Twenty-four hours postoperatively the patient's creatinine had improved to 1.9 mg/dL, and five days postoperatively the patient was discharged with a creatinine of 1.7 md/dL. No post-operative peritoneal effusion was noted. Three months post-discharge, no recurrence of the perinephric pseudocyst was noted, and the patient's creatinine is stable at 2.1 mg/dL. This is the first description of successful subcutaneous ureteral bypass placement through a perinephric pseudocyst to alleviate ureteral obstruction.

THE THERAPEUTIC USE OF TETRASODIUM ETHYLENEDIAMINETETRAACETIC ACID SOLUTION (tEDTA) FOR TREATMENT OF SUBCUTANEOUS URETERAL BYPASS (SUB) DEVICE MINERALIZATION IN CATS

Chik C1, Berent A1, Weisse C1, Ryder M2
Animal Medical Center, New York, NY Ryder Science, Inc. Medical Biofilm Research, Brentwood, TN.

Objective: To evaluate a 2% tetrasodium ethylenediaminetetraacetic acid (tEDTA) solution for the treatment of mineralization occlusion in cats with a SUB device.
Study Design: Retrospective study.
Animals: Six client-owned cats with 8 obstructed devices.
Methods: Partial occlusion of SUB device(s) in each cat was determined based on a combination of ultrasound, SUB flush, and failure to identify another cause of SUB obstruction. Each SUB was drained and flushed using sterile saline and then irrigated with 1-2mL of 2% tEDTA solution. Demineralization success was defined as persistent normalization of flow during ultrasound visualization while flushing at subsequent visit. The volume and frequency of tEDTA instillations, development of device patency, follow-up biochemical and ultrasound findings, and future reobstruction events were recorded.
Results: Resolution of mineralization was documented in 8 of 8 SUBs after a median of 1.5 tEDTA infusions (range, 1-6 infusions). Partial reobstruction events secondary to mineralization occurred in two cats, one at 19 days and another at 56 days after initial demineralization. Both resolved after additional tEDTA infusions, but one ultimately required device exchange at 356 days from first infusion. One infusion was prematurely aborted due to persistent pelvic dilation after1.25mL tEDTA instillation due to slow passive drainage. No complications were observed.
Conclusions: Tetrasodium EDTA infusions can be safely considered as a treatment option for mineralized SUB devices in cats. This solution was easily infused, well-tolerated, and avoided the need for SUB device exchange in a majority of cats it was used in.

ENDOSCOPIC REMOVAL OF A SUPERFICIAL TRANSITIONAL CELL CARCINOMA IN THE BLADDER OF A DOG USING A PEDIATRIC RESECTOSCOPE

Watkins C.
VetMed Consultants, Holladay, Utah

A 9 year old female spayed Scottish Terrier presented for abdominal ultrasound to evaluate for a cause of elevated alkaline phosphatase. She was asymptomatic. Physical examination was unremarkable. The ultrasound examination revealed an incidental small mucosal mass arising from the urinary bladder wall at the apex. Margins of the mass were mildly irregular and there were several small hyperechoic foci on the surface. Bladder wall layering was intact deep to the mass. Cystoscopy was performed confirming the presence of the small superficial mass arising from the urinary bladder apex. The mass was pale and had irregular margins. There were multiple yellow foci on the surface of the mass (mineralization). A 7-8 mm diameter region of abnormal erythematous mucosa extended beyond the mass. Full-thickness mucosal resection of the mass was performed using a pediatric resectoscope with a loop electrode and electrocautery. Very superficial abnormal tissue creeping radially from the mass was ablated with a ball electrode. She was treated with 1 week course of amoxicillin and carprofen. Histopathology results confirmed transitional cell carcinoma. The owners declined chemotherapy. Abdominal ultrasound and cystoscopy were repeated at 3 months and 10 months post resection. No evidence of mass recurrence was found. She remains asymptomatic 30 months post resection.

FINDINGS ON TRANSURETHRAL CYSTOSCOPY IN DOGS WITH RECURRENT URINARY TRACT INFECTIONS : RETROSPECTIVE STUDY FROM 2011-2018

Llido M, Vachon C, Dickinson M, Dunn M

Clinical studies, Veterinary Hospital of the University of Montreal, St-Hyacinthe, Quebec, Canada

Objective: Describe findings on transurethral cystoscopy in dogs presented for recurrent urinary tract infections (UTIs).

Study design: Medical records of dogs with recurrent UTIs that underwent transurethral cystoscopy between 2011 and 2018 were retrospectively reviewed.

Animals: Fifty-three client-owned dogs with recurrent UTIs were included in the study.

Materials & Methods: Data collected from medical records included signalment, clinical findings, bladder wall culture, cystoscopic and histopathologic findings. An episode of UTI was defined as: presence of compatible clinical signs and at least 2 out of 3 of the following criteria: 1) pyuria ; 2) positive urinary culture; 3) resolution of clinical signs with antibiotic therapy. Recurrence of UTI was defined as at least 2 episodes of UTI within a 6-month time period or at least 3 or more in 1 year.

Results: The median age at presentation was 3 years (0.5 – 12 years) with a majority of females 91% (48/53), 83% were spayed (40/48). A hooded vulva was noted in 70% (34/48) of females. Main breeds were Labrador Retriever (10/53), Australian shepherd (4/53) and Schnauzer (3/53). Transurethral cystoscopy showed abnormalities in 83% (44/53): mucosal edema (19/53), vestibulovaginal septal remnant (14/48), prominent lymphoid follicles (8/53), a short urethra (6/53) and ectopic ureter (5/53). Bladder wall culture was positive in 27% (13/49). Bladder wall edema and ulceration in 64% (25/39) were the most common findings on histopathology.

Conclusion: Transurethral cystoscopy is useful in the identification of structural anomalies in dogs presenting with recurrent UTIs. Interventional endoscopy allows simultaneous diagnosis and correction of some of these anomalies.

NOTES:

ENDOSCOPIC RETROGRADE CHOLANGIOGRAPHY IN DOGS AND CATS FOR THE TREATMENT OF EXTRAHEPATIC BILIARY DUCT OBSTRUCTION (EHBDO): 15 DOGS AND 3 CATS

Berent A1, Weisse 1, Manoharan S1, Schattner M2, Gerdes H2, Pari S2, Mendelsohn R2. The Animal Medical Center, Department of Interventional Radiology/Endoscopy Memorial Sloan Kettering Cancer Center, Hepatology and Nutrition Service, New York

Objective: To describe the technical and clinical outcomes after endoscopic retrograde cholangiopancreatography (ERCP) and biliary stent placement (EBS) for the treatment of EHBDO in clinical patients.

Materials and Methods:ERCP/EBS was attempted using a side-viewing duodenoscope. A sphincterotome was used to cannulate the common bile duct (CBD) and perform sphincterotomy when indicated. A retrograde fluoroscopic-cholangiogram confirmed EHBDO. A guidewire was advanced up the CBD. A stent (plastic or metallic) was placed when indicated. Patients were followed for biochemical, imaging, and overall outcomes.

Results: Fifteen dogs(3.2-55kg) and 3 cats(2.75-4.7kg) had ERCP attempted with a median total bilirubin of 11.1 mg/dL(1.7-29). Etiology of obstruction included: stricture(n=10), choledocholithiasis(n=3), mass(n=3), and debris(n=2). Pyloric cannulation was successful 18/18, ERC in 12/15(80%) dogs and 2/3(66.7%) cats, and EBS in 11/14 dogs and 1/3 cats, and a sphincterotomy alone in 1. A surgically-assisted fluoroscopic-guided stent placement was successful in 2/2 cats and 1/3 dogs that failed EBS when surgery was attempted. In 2 dogs the CBD was unable to be cannulated endoscopically or surgically so a subcutaneous-intestinal biliary-bypass device (n=1) or cholecystoenterostomy was performed (n=1). One dog was euthanized and did not elect to have surgery. 15/17 patients survived to discharge and had resolution of EHBDO. No animals died after successful ERCP, and 3/6 died after surgery. Median hospitalization time for ERCP and surgery was 1.75 and 9 days, respectively. Cholangitis was seen in 5/12 followed long-term after ERCP and 2 required an additional procedure to clear the stent of debris. No animal died from their EHBDO if they had an ERCP performed. The median follow-up time was 288 days(1-1233) for ERCP and 22 days(0-179) for traditional surgery, with 4 ERCP still alive.

Conclusions:ERCP is safe and effective in dogs and cats with EHBDO. This procedure was associated with short hospitalization times and low perioperative morbidity(5%) and mortality rates(0%).

PERCUTANEOUS TRANSHEPATIC CHOLECYSTOSTOMY DRAINAGE IN A DOG WITH EXTRAHEPATIC BILIARY OBSTRUCTION SECONDARY TO PANCREATITIS

Thomson CB 1, Young SJ 2, Granick JL 1, Ober CP 1, Chmelovski R 1

Veterinary Clinical Sciences Department, University of Minnesota, St. Paul, MN Department of Radiology, University of Minnesota, Minneapolis, MN

An 8-year-old female spayed Rottweiler dog with a history of idiopathic epilepsy treated with phenobarbital was admitted for acute-on-chronic anorexia and vomiting. Extrahepatic biliary obstruction secondary to pancreatitis was diagnosed based on biochemistry profile, computed tomography, and cytology. Only marginal improvement was observed with 24 hours of traditional medical management, therefore novel, continual biliary decompression was achieved with a percutaneous transhepatic cholecystostomy drainage tube (PCT). Using ultrasound guidance, a 14-gauge, 5.25 in long, over-the-needle catheter was passed within the 12th intercostal space, through an approximately 2 cm length of liver, and into a distended intrahepatic bile duct. Bile was aspirated and collected for cytology and culture, and a positive-contrast cholangiogram was performed. An 0.035 in, 145 cm straight tip stiff guidewire was passed through the catheter, down the intrahepatic bile duct and into the gallbladder, and the catheter removed over the wire. A 6 Fr locking loop drainage catheter was advanced over the wire, into the gallbladder, locked in place and secured to the skin via retention sutures. Patency was confirmed by aspirating bile and with positive contrast cholangiogram. Within 24 hours post-PCT placement, the patient was eating regularly, had increased intestinal peristaltic sounds on abdominal auscultation, and no longer required nasogastric tube feeding. Total bilirubin decreased from 23.1 to 7.7 mg/dL within 22 hours. The PCT remained in place for 5 weeks and was successfully removed following a cholangiogram which confirmed bile duct patency.

TREATMENT OF INTRAHEPATIC PORTOSYSTEMIC SHUNT BY A MODIFIED PERCUTANEOUS TRANSVENOUS COIL EMBOLIZATION IN A DOG

Chang YF, Huang MR., Chen SH. Jong Shing Animal Hospital, Kaohsiung, Taiwan

Pidan is a 1.2-year-old male Japanese Shiba, has been the smallest in the same fetus since birth. These days, Pidan is scrawnier because poor appetite. In the early hours of July 26 in 2018, Pidan was sent to emergency room due to salivation, vomiting, and unclear awareness. After the physical examination and blood biochemical examination, the results of test showed the liver index, blood ammonia, and bile acid were higher than normal value. The ultrasound examination found abnormal vascular plexus and disturbance flow in the right lobe of liver. According to these finding of examinations, the tentative diagnosis was hepatic brain syndrome. Consciousness and vomiting symptoms were recover after ammonia reduction treatment for 24 hours. The computed tomography scan was performed after two days. The CT images show that a intrahepatic portal vein shunt was existence in right lobe of liver.

According to the results of CT images, interventional therapy was performed to blocked the abnormal vessel in right lobe of liver. The percutaneous transvenous coil embolization (PTCE) was administrated in the vessel when a 18mm x 80mm caval stent was placed in caudal vena cava. The operation area of neck was scrubbed as the routine surgical. Then the vena cava angiography and caval stent placing were performed in order.

When the portal angiography was performed. Two shunts which connected the portal veins and hepatic vein were found unanticipated. The abnormal vessels were located clearly in the DSA images. The embolization was administrated through 4Fr Berenstein Catheter. The blood flow between the portal vein and hepatic vein were blocked successfully by two 5mm embolization coil.

There were no obvious clinical symptoms after the procedure. The dog recovered very well. Two months after intervention, the follow-up study of blood test, blood ammonia and bile acid were returned to normal values. Compared to that release of multiple embolization coils blocking the exit of the hepatic vein into the posterior vena cava, this case places two coils in the shunt instead, under the real-time angiography, it appears outstanding treatment effect for the intrahepatic portosystemic shunt.

STENTING AND ANGIOPLASTY OF A LEFT ILIAC THROMBOSIS IN A DOG.

Rodriguez-Zapater S. 1, Serrano-Casorran C. 1,2, Lopez-Minguez S. 1,Fuente S. 1, Bonastre C. 1,2, Gregorio MA. 1.

GITMIvet- Interventional Radiology Unit. Veterinary Hospital-University of Zaragoza.

Introduction: Thrombosis in dogs is an uncommon condition that usually arises to a predisposing disease. Abnormalities in blood flow, injured endothelium and blood hypercoagulability are 3 general factors predisposing to thrombus formation. Some described treatments consist of Aspirin administration or intravenous infusion of tissue plasminogen activator, however, results are no sufficient to solve the pathology.

Aim: to describe the interventional radiology management of a dog with aortic and left iliac thrombotic occlusion.

Material and Methods: Diagnosis was performed by ultrasound examination; a thrombus in abdominal aorta and no-blood-flow was detected in the left hind limb.Given the severity of the arterial obstruction, stenting the artery with the combination of Urokinase treatment was elected. Surgical procedure was performed by fluoroscopy guidance. A 6 Fr introducer sheath was placed at the right femoral artery (Seldinger technique) and different guidewire and catheters were required to get to the thrombus location. Two self-expanding stents were deployed. To obtain maximum expansion of the stent was performed an angioplasty. Besides, 200.000 UI urokinase was trickled in depth femoral artery.

Results: After the intervention, the limb temperature began to be recovered and the patient started walking normally without any painful sign.

Conclusions:The positive results give us more evidences that the interventional radiology (IR) can be used to recanalise vascular obstructions without the need of aggressive surgeries.

USE OF PERCUTANEOUS TRANSVENOUS COIL EMBOLIZATION IN THE TREATMENT OF INTRAHEPATIC PORTOSYSTEMIC SHUNTS IN CATS

Culp WTNa, Griffin MAa, Case JBb, Zwingenberger ALa, Marks SLa

University of California-Davis, School of Veterinary Medicine, Davis, CA University of Florida, College of Veterinary Medicine, Gainesville, FL

Objective: Portosystemic shunts are congenital vascular anomalies resulting in aberrant communication between the portal and systemic venous systems. Surgical attenuation of intrahepatic portosystemic shunts (IHPSS) is generally considered to be challenging and often associated with greater treatment-related complications compared to that of extrahepatic portosystemic shunts (EHPSS). The objective of this study was to describe the outcome associated with the use of percutaneous transvenous coil embolization (PTCE) in the treatment of IHPSS in cats.

Study Design: Case series

Animals: 4 client-owned cats

Methods: In all cats, stent-supported PTCE was performed. Medical records were reviewed and data regarding short- and long-term outcome was recorded.

Results: Four cats (6-9 months old) were evaluated for clinical signs consistent with IHPSS; three cats demonstrated neurologic abnormalities including ataxia, head pressing, and disorientation, and one cat was evaluated for urethral obstruction. Common bloodwork findings included hypoproteinemia, decreased BUN, and increased bile acids. All cats were diagnosed with IHPSS based on diagnostic imaging findings. No major intra-procedural complications were encountered, and all cats were discharged from the hospital. At long-term evaluation (range 7-41 months), all neurologic clinical signs appeared resolved with owners reporting normal behavior in all cats. One cat that was originally presented for neurologic signs developed lower urinary tract signs after treatment and was diagnosed with an acquired EHPSS.

Conclusions: Although the diagnosis of IHPSS in cats is uncommon and the sample size of this case series is limited, the use of PTCE appears to hold promise as a treatment modality in cats with IHPSS.

3-DIMENSIONAL ROAD MAP GUIDANCE FOR PERCUTANEOUS COIL EMBOLIZATION OF INTRAHEPATIC PORTOCAVAL SHUNTS IN 2 DOGS

Scansen BA

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Objective: Intrahepatic portocaval shunt anatomy in the dog can be complex and oblique fluoroscopic projections are occasionally required to facilitate catheterization of the anomalous vasculature. Fusion imaging allows previously acquired angiograms, either computed tomography angiography (CTA) or 3-dimensional rotational angiography (3DRA), to be fused with live fluoroscopy creating a 3D road map of the vessels for catheter guidance. The objective of this study was to evaluate the feasibility of generating a 3D road map using CTA or 3DRA fusion in dogs with an intrahepatic portocaval shunt.

Animals & Study Design: Retrospective case report of 2 dogs.

Results: Two dogs have undergone fusion imaging to date, one using CTA fusion for initial shunt attenuation and a second who underwent 3DRA during repeat embolization of numerous veno-venous connections. CTA and 3DRA fusion provided unique anatomic information compared to standard angiography, while offering guidance that facilitated catheterization and limited the need for repeat angiography.

Conclusions: Both CTA fusion and 3DRA fusion were able to generate a 3D road map of the portal vasculature of dogs with intrahepatic portocaval shunt that could be overlaid onto live fluoroscopy during catheterization. This technology may limit the need for repeat angiography during complex vascular procedures and could facilitate more rapid catheterization of the portal vasculature in dogs undergoing percutaneous coil embolization for intrahepatic portocaval shunt attenuation.

HYBRID EMBOLIZATION AND LIGATION OF A HEPATIC ARTERIOVENOUS MALFORMATION VISUALIZED WITH 3D PRINTING IN A 6-YEAR-OLD DOG

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A 6-year-old, intact male, mixed-breed dog was evaluated for weight loss, lethargy, hind-limb ataxia, muscle tremors, vomiting and melena. At 8 months of age, he developed ascites and was diagnosed with a hepatic shunt via ultrasonography. On presentation, he weighed 2.4 kg and had an elevated plasma ammonia concentration (PAC) of 117 umol/L (normal range 0-40 umol/L). A CT angiogram (CTA) revealed microhepatica, an arteriovenous malformation (AVM) between the left hepatic artery and portal vein and numerous acquired portosystemic varices. Clinical signs persisted despite medical therapy. A 3D reconstructed model of the CTA was created to facilitate procedural planning. A 5-French introducer was inserted in the right femoral artery and a celiotomy was made to allow access to the AVM and for portal pressure measurement. Angiography revealed two major aberrant vessels branching off the hepatic artery which fed into a complex nidus then decompressed through the portal vein and acquired portosystemic varices. Hepatofugal blood flow was documented. Two 3 x 7 mm MREye tornado coils were used to embolize each major aberrant artery followed by ligation of the dominant draining portal vein and glue embolization of the nidus and left hepatic artery. Post-embolization angiography showed absence of flow through the AVM and nidus. Pre and post-embolization portal pressures were 10 and 4 mmHg, respectively. No complications were identified postoperatively. Six weeks post-embolization, the patient's clinical signs had resolved, quality of life had improved, body weight was 3.2 kg and biochemical values had remained relatively stable (PAC of 66 umol/L).

USE OF A NOVEL DRUG-ELUTING EMBOLIC MICROSPHERE IN THE TREATMENT OF NONRESECTABLE LIVER NEOPLASIA IN DOGS: INITIAL RESULTS

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Objective: In dogs with non-resectable hepatic neoplasia, treatment options are limited. The objectives of this study are to describe the use of a novel drug-eluting embolic microsphere for use during transarterial chemoembolization (TACE), to compare tumor volume pre- and post-TACE, and to measure systemic paclitaxel concentration post-TACE.
Study Design: Prospective clinical trial
Animals: 4 client-owned dogs

Methods: Dogs with non-resectable hepatic neoplasia were enrolled, and a CT scan was performed. TACE using a novel drug-eluting embolic microsphere containing paclitaxel was performed. At 1-month post-TACE, a second CT scan was performed and results were compared. Blood samples were obtained at specified time points post-TACE to determine systemic paclitaxel concentrations.

Results: Four dogs (median weight: 10.5 kg) have been enrolled to date. TACE was successfully performed in all cases, and no intra-procedural complications were encountered. All dogs experienced lethargy and anorexia post-embolization, with return to normal activity noted to occur between 10-14 days post-TACE. Tumor volume decreased in all dogs by a median of 42% (range, 35-50%) 1-month post-TACE, and 3 of 4 dogs are currently alive with improved clinical signs. Mean peak plasma concentration of paclitaxel (32 ng/ml) occurred 4 days post-TACE and had decreased to approximately 2 ng/ml by 14 days post-TACE.

Conclusions: Initial results associated with TACE as performed in this study are promising. While post-TACE clinical signs are common in dogs, these signs are similar to what is experienced after bland embolization. Tumor volume decreased in all dogs 1-month post-TACE and tolerance of the drug-eluting microsphere was high.

DRUG-ELUTING BEAD CHEMOEMBOLIZATION FOR THE TREATMENT OF INCOMPLETELY RESECTABLE HEPATOCELLULAR CARCINOMA IN DOGS: A PROSPECTIVE CLINICAL TRIAL

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Background: Efficacy of traditional therapies for incompletely resectable canine hepatocellular carcinoma (HCC) is limited.
Hypothesis/Objective: Objectives were to report outcomes, complications, and tumor responses via CT assessment scores following drug-eluting bead transarterial chemoembolization (DEB-TACE) for incompletely resectable HCC. The authors hypothesized that complications would be uncommon and that short-term CT assessment would demonstrate stable disease or partial remission.
Animals: Client-owned dogs (n=17) with incompletely resectable HCC.
Methods: Dogs were treated with superselective DEB-TACE performed to varying levels of blood flow stasis in a prospective, single-arm clinical trial. Data from medical record review were recorded and evaluated statistically. Pre-treatment, treatment, and post-treatment CT scans were compared.
Results: DEB-TACE was successfully administered in 29/31 (94%) of treatments. MST following initial treatment was 337 days (range, 22-1061). All dogs had stable disease at follow-up examination per RECIST 1.1. Severe adverse events occurred following 3/29 (10%; 95% CI 2-27%) treatments: hepatic abscess/septicemia (2) and cholecystitis/death (1). Patients with a presenting complaint of weight loss (p=0.016) or with complications within 48 hrs-2 weeks of DEB-TACE (p=0.046) demonstrated a shorter MST. On pre-treatment CT, percent lesion necrosis (p=0.031), WHO score adjusted for bodyweight (p=0.034), and tumor volume adjusted for bodyweight (p=0.026) were associated with a shorter MST.
Conclusions:DEB-TACE for incompletely resectable HCC is a feasible and minimally invasive procedure which promoted stable disease in this population. Future studies comparing DEB-TACE to other treatments and investigating the predictive validity of tumor response guidelines are warranted.

ACUTE TUMOR LYSIS SYNDROME IN A DOG AFTER INTRA-ARTERIAL EMBOLIZATION OF HEPATOCELLULAR CARCINOMA

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A 13-year-old male, castrated Shih Tzu was evaluated for elevated liver values and a right divisional liver mass. Abdominal CT angiography revealed a large hepatic mass that incorporated the right and some of the left liver lobes and encompassed the caudal vena cava. Intra-arterial bland embolization (IAE) of the right hepatic artery branches supplying the mass was performed routinely with 300-500 micron PVA particles. Twenty-four hours after the procedure, the patient marked increased in liver enzymes (ALT = 19,089 U/L, AST = 71,958 U/L) and increased total bilirubin (1.1 mg/dL). Hypocalcemia (total calcium = 9.0 mg/dL) and hyperphosphatemia (6.3 mg/dL) was also present, meeting the Cairo-Bishop definition of Tumor Lysis Syndrome (TLS). Hypocalcemia (7.3 mg/dL) and hyperphosphatemia (9.9 mg/dL) progressed the next day, with no significant change in creatinine. The patient developed clinical evidence of systemic inflammatory response syndrome (SIRS), hypotension requiring vasopressor support, marked metabolic acidosis, acute kidney injury, and oliguria 48 hours post-IAE. Abdominal ultrasound slowed local peritonitis in the region of the right liver mass, pancreatitis, and small volume abdominal effusion, confirmed to be neutrophilic inflammation. Vasopressor dependent hypotension and metabolic acidosis progressed, and the patient developed ventricular tachycardia and became minimally responsive, followed by cardiopulmonary arrest several hours later. Necropsy confirmed the presence of a large right-sided hepatocellular carcinoma with widespread coagulative necrosis of the liver. Post-embolization TLS has been rarely reported in humans with hepatocellular carcinomas. To our knowledge this is the first documentation of its occurrence in a dog after IAE.

MAINTAINED OLFACTORY CAPABILITIES AFTER MAXILLARY ARTERY EMBOLIZATION IN A POLICE DOG WITH SCOTT'S SYNDROME

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A 3.5 year-old intact male German shepherd/Belgian Mallinois mix police dog trained for narcotic and weapons detection was evaluated for protracted bilateral epistaxis that was progressive after rhinoscopy with endoscopic biopsies. Rhinoscopy was performed during initial evaluation for the epistaxis 8 days prior to presentation. Multiple transfusions with packed red blood cells and lyophilized platelets were used to support ongoing hemorrhage and aminocaproic acid was administered for hyperfibrinolysis. Platelet labeling and flow cytometry showed abnormal externalization of phosphatidylserine. This abnormality is characteristic of canine Scott Syndrome, which is a hereditary defect of procoagulant activity documented in German shepherds. Bilateral maxillary artery embolization with 255-350 micron particles was performed routinely via femoral artery access. Embolization resulted in cessation of hemorrhage and the patient was discharged 48 hours post-operatively. One month post-embolization, preserved detection capabilities for various hidden narcotics and bullet shell casings was confirmed in multiple search environments.
Scott Syndrome is a rare hereditary bleeding disorder in German shepherds that can cause severe epistaxis, for which maxillary artery embolization has been documented to be effective for minimally invasive therapy. Repeated embolization can be performed if needed for bleeding recurrence, making this procedure preferable compared to carotid artery ligation in patients with a known bleeding tendency. Given that German shepherds are one of the most common breeds of dogs used in scent detection work, it is important to know if highly sensitive olfaction is maintained after this procedure to determine prognosis for return to function for these working dogs.

USE OF ETHYLENE VINYL ALCOHOL COPOLYMER (ONYX®) IN THE TREATMENT OF AN INTRACRANIAL ARTERIOVENOUS MALFORMATIONIN A DOG

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Pacific Veterinary Specialists, Capitola, CA

A 6-year-old male castrated German shepherd dog was evaluated for dull mentation, blindness, bilateral exophthalmos, and significant periocular pain. A magnetic resonance imaging (MRI) scan of the brain was performed and revealed a large, mass-like structure consisting of abnormal blood vessels primarily encompassing the right side of the dorsum sella and pituitary fossa with extension into the left cavernous sinus and basilar artery. The venous vessels rostral to the mass were severely distended and extended into the retrobulbar spaces. An arteriovenous malformation (AVM) was diagnosed. After discussion with the owner, liquid embolization of the AVM was elected. A right femoral arterial approach was performed, and selection of the blood supply to the brain was performed sequentially. After vascular mapping of the AVM, abnormal vascular branching was noted from the right and left maxillary arteries and right and left vertebral arteries. Ethylene vinyl alcohol copolymer (Onyx®) was injected into the abnormal blood vessels branching from the right and left maxillary arteries and the left vertebral artery. No intra-procedural complications were encountered, and the dog was able to be discharged the next day. At recheck evaluation 5 months post-embolization, the owner reported that the dog no longer appeared painful and was significantly more active, and the exophthalmos was dramatically improved. An MRI performed at this time demonstrated elimination of flow through the major segments of the AVM and decreased retrobulbar distension. At 1-year post-embolization, the dog continues to do well and is subclinical except for continued blindness.

TRANSARTERIAL CHEMOEMBOLIZATION (TACE) FOR PALLIATIVE TREATMENT OF LARGE RENAL CELL CARCINOMA WITH PULMONARY METASTASIS IN A DOG

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Renal cell carcinoma (RCC) often causes metastasis to the lungs in dogs. Nephrectomy is the treatment of choice for canine unilateral RCC that have not metastasized. Any treatments have been not yet demonstrated to improve quality of life (QOL) and survival time of the RCC cases with metastasis. The objective of this report was to evaluate the transarterial chemoembolization (TACE) as a palliative treatment for large RCC with pulmonary metastasis in a dog. A 4-year-old, spayed female, Miniature Dachshund with a large renal tumor was referred. The clinical signs included anorexia, acute weight loss and decreased activity due to the cancerous cachexia. Computed tomography revealed the oncogenesis of right kidney (approximately 7.5-cm in diameter), and several small nodules formation in whole lungs. On 5th day after the initial evaluation, the needle core biopsy was done, followed by TACE thru the catheter which advanced into the right renal artery from the femoral artery. The suspension of carboplatin (100 mg/m2) and equivalent lipiodol was injected, followed by the injection of small volume of gelatin particles with 1-mm in diameter (Gelpart®). Histopathological diagnosis of the biopsy sample was RCC. The clinical signs and body weight of the patient were improved after the TACE. Postoperative X-ray series had demonstrated the mass reduction of RCC: however, the pulmonary metastasis was advanced. The patient died on 215th day after the initial evaluation. The TACE is suggested to have the improvement of QOL and survival benefit as a palliative treatment for canine RCC even with distant metastases.

SUSPECTED CONTRAST-INDUCED NEPHROPATHY IN THREE CONSECUTIVE PATIENTS UNDERGOING VASCULAR INTERVENTIONAL RADIOLOGIC PROCEDURES

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Objective: Contrast-induced nephropathy (CIN) is a well-documented complication following vascular interventional radiology procedures that utilize iodinated contrast. The objective of this study was to describe three consecutive cases in which CIN was suspected after transarterial embolization.

Study Design: Case series

Animals: Two client-owned dogs and one client-owned cat

Methods:In all animals, transarterial embolization was performed. The contrast media utilized for all three procedures was obtained from the same lot. Data regarding pre-and post-embolization renal values was recorded. Contrast-induced nephropathy was defined as an absolute (0.5 mg/dL or greater) or relative (25% or greater) increase in creatinine from baseline concentration 48-72 hours following administration of iodinated contrast medium.

Results: Two dogs (8.2 kg and 8.7 kg) developed CIN after undergoing transarterial prostatic and hepatic embolization, respectively; one cat (2.6 kg) developed CIN after undergoing transarterial hepatic embolization. The administered contrast dose was less than 2 mL/kg in all cases. Pre-procedure, the dog undergoing prostatic embolization was mildly azotemic (creatinine 1.8 mg/dL) and both other patients had creatinine values within the reference interval. No major anesthetic or intra-procedural complications occurred. In all patients, creatinine increased from baseline (range 2.6-7.2 times baseline) and peaked at 1-2 days post-procedure; renal values improved to within the reference interval 4-12 days post-embolization.

Conclusions: Given the development/progression of azotemia post-contrast medium administration in these patients, CIN was suspected and causes are being investigated. Contrast-induced nephropathy should be considered as a possible complication following interventional radiology procedures that involve the use of injectable iodinated contrast medium.

RADIATION DOSE DURING INTERVENTIONAL CARDIOLOGY PROCEDURES: PORTABLE C-ARM VERSUS A NEW GENERATION FLUOROSCOPY SYSTEM

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Objective: This study evaluated radiation dose between a portable C-arm and contemporary interventional suite. Both fluoroscopy systems utilized digital flat panel detector for image capture and were from the same manufacturer. The suite incorporated a new generation fluoroscopy system designed to reduce radiation exposure with equivalent image quality.

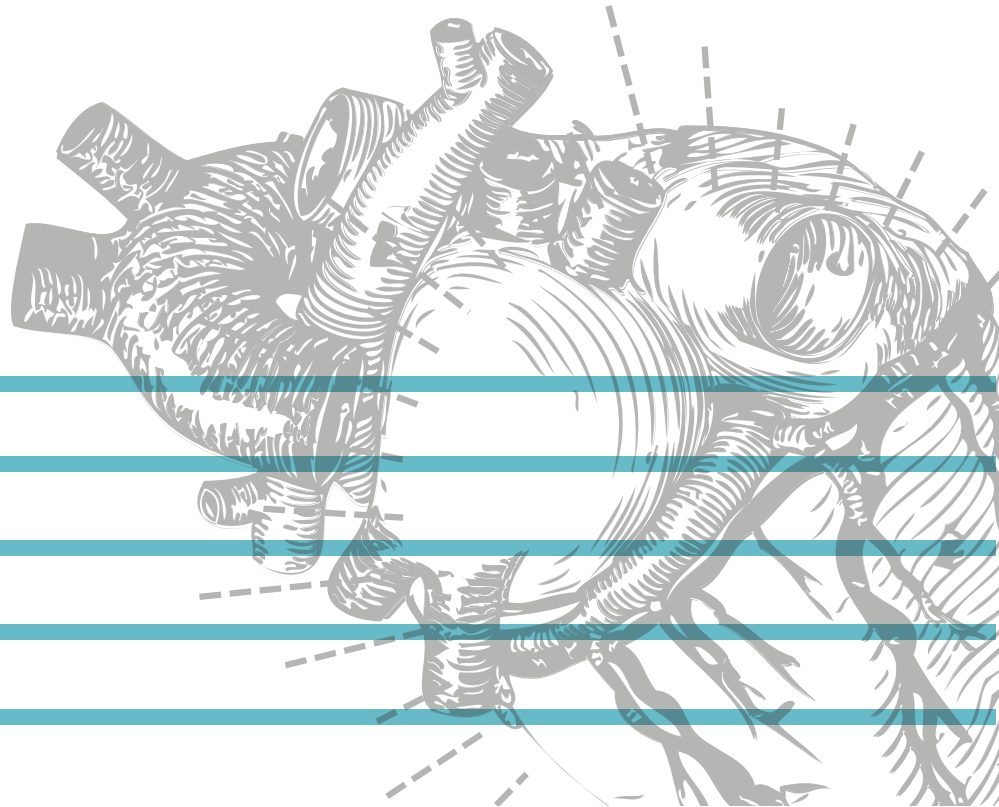
Study Design: Retrospective review of radiation dose during interventional cardiology procedures including patent ductus arteriosus (PDA) occlusion, balloon pulmonary valvuloplasty (BPV), and transvenous endocardial pacemaker implantation performed February 2016 to November 2018.

Methods: Fluoroscopy equipment, procedure type, operator, patient weight, fluoroscopy time, and dose area product (DAP) were recorded. A linear regression model was used to evaluate the effect of the above variables on radiation dose.

Results: The study population (154 dogs) comprised 61 PDA occlusions, 60 BPV, and 33 pacemaker implantations. The portable C-arm cases totaled 102, those in the suite totaled 52. Radiation dose was significantly reduced in the interventional suite (DAP mean, range = 3782, 226 – 15144 mGy.cm2) compared to portable C-arm (DAP mean, range = 6752, 645 – 75300 mGy.cm2) (P=0.0011). This reduction persisted after adjusting separately for effect of patient weight, procedure type, fluoroscopy time, and operator. Radiation dose for both sites increased significantly with patient weight, as expected (P<0.0001).

Conclusions: New technologies in contemporary fluoroscopy systems include beam filtration, automated motion correction, and advanced digital processing that permit image enhancement at reduced radiation dose. We documented a significant reduction in dose using these technologies as compared to a conventional C-arm for standard interventional cardiology procedures in dogs.

NOTES:



SURVEY EVALUATION OF ENDOSCOPIC TECHNIQUES FOR ESOPHAGEAL AND GASTRIC FOREIGN BODY REMOVAL IN THE DOG AND CAT

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Introduction: Esophageal and gastric foreign bodies (EFB and GFB) are a common occurrence in cats and dogs. The objective of this study was to evaluate the endoscopic techniques and instruments used by internists or criticalists based on type and location of the foreign body.
Material and Methods: An online, anonymous survey was created using a commercial software and approved by the UF IRB. The survey was distributed to diplomates of the ACVIM (SAIM) and ACVECC through each college's listserv. Data obtained included specialty, years in practice, practice type, available instruments, and preferred instrument for various foreign bodies by location and type. Data was analyzed using descriptive statistics.
Results: 268 surveys were completed with 74% from private referral practice and 21% from academic practice. For EFB, laparoscopic or endoscopic grasping forceps were used most commonly and with a flexible endoscope. An overtube was used ~50% of the time for EFB including sharp objects and bones. For GFB, grasping forceps or loop snares were used most commonly with baskets or loop snares used for round objects. 56% reported using a baby bottle liner technique for GFB removal. 50% reported attempting duodenal FB removal.
Conclusions: Endoscopic grasping forceps and loop snares are most commonly used to remove EFB and GFB. Baby bottle liner technique can be used for harder to grasp or small objects.

FLUOROSCOPIC-GUIDED USE OF AN ENDOVASCULAR SNARE SYSTEM FOR THE MANAGEMENT OF URINARY TRACT FOREIGN BODIES

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Objective: To report on the use of an endovascular snare system (ESS) for management of urinary tract foreign bodies in dogs and cats.
Study Design: Case series
Animals: Client-owned dogs (8) and cats (3)
Methods: An ESS (EnSnare®) was utilized to perform one of three procedures: retrieval of migrated urethral catheters, removal of previously placed ureteral stents, and repositioning of ureteral stents.
Results: An ESS was successfully utilized with fluoroscopic-guidance in 8 dogs (median weight: 26 kg) and 3 cats (median weight: 5 kg) for the management of urinary tract foreign bodies; 1 dog had 2 ESS procedures. Snare loop sizes were 6-10 mm (1 cat), 12-20 mm (4 dogs, 2 cats), and 18-30 mm (5 dogs). Urethral catheters (n=5) had been placed for urine drainage, and were traumatized and transected resulting in positioning of the catheter remnant in the bladder (+/- urethra). Ureteral stents were removed transurethrally in 2 dogs after migration or obstruction. In 2 cats, non-migrated ureteral stents were removed after becoming obstructed. Two dogs required repositioning of ureteral stents after percutaneous placement for neoplastic obstructions. Finally, in 1 cat the ESS was placed into the renal pelvis to remove a ureteral stent that had migrated cranially into the ureter and renal pelvis.
Conclusions: The ESS described in this report may be utilized in a wide range of patient sizes for numerous indications and can be considered a minimally invasive option for management of urinary tract foreign bodies in dogs and cats.

FRACTURE AND RETRIEVAL OF A URETERAL CATHETER DURING URETEROSCOPY IN A DOG

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A 1.5-year-old, neutered male, English bulldog was presented for treatment of persistent left pyelonephritis caused by a multiple-drug-resistant strain of E. coli. Previous diagnostics had identified a dilatated left renal pelvis and left ureter. Physical examination was unremarkable. A left ectopic ureter was identified on CT. Under general anesthesia, a percutaneous perineal approach was made to the proximal urethra and cystoscopy was performed using a rigid, 2.7 mm, 30° cystoscope. A left intramural ectopic ureter was identified with openings at the trigone and the prostatic urethra. Left ureteroscopy was performed by passing the cystoscope over a 5.0 mm open-ended ureteral catheter to straighten the ureter, during which the catheter broke within the ureter. A second ureteral catheter was passed over a 0.0035” weasel wire adjacent to the proximal piece of the broken catheter. The renal pelvis was lavaged; however, the broken catheter did not flush down the ureter. Using a combination of fluoroscopy and ureteroscopy, the distal end of the broken catheter was visualized. An endoscopic grasper was used to grasp the catheter, and the piece was successfully extracted from the proximal ureter. The catheter appeared to be sharply severed, most likely because of kinking at the beveled end of the cystoscope. Laser ablation of the ectopic ureter was performed prior to completion of the procedure. With appropriate continued antibiosis based on culture, the infection cleared and the patient fully recovered. No post-operative morbidity associated with intra-ureteral catheter severance or retrieval was noted.

PERCUTANEOUS RADIOLOGICALLY-GUIDED GASTROSTOMY TUBES: PROCEDURAL DESCRIPTION AND BIOMECHANICAL COMPARISON

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Objective: Percutaneous endoscopic gastrostomy (PEG) tubes are the most common nonsurgical method of gastrostomy tube placement in dogs; however, the use of PEG tubes in large dogs (>25 kg) is limited due to concerns for complications. In humans, a minimally invasive percutaneous radiologically-guided gastrostomy (PRG) tube placement technique has been described with excellent outcomes. The objectives of this study were to describe a procedure for placement of PRG tubes in a canine model and to biomechanically compare the PRG and PEG tube techniques.
Study Design: Cadaveric descriptive and biomechanical study
Animals: 15 canine cadavers
Methods:PEG tubes, low-profile PRG tubes, and long PRG tubes were each placed in five large (> 25 kg) canine cadavers. PRG tubes were placed with fluoroscopic-guidance after T-fastener gastropexy. Body wall and stomach (with attached tubes) were harvested and biomechanically tested. Data regarding the maximal load to failure was statistically analyzed.
Results: In all dogs, PRG tube placement was successful with no procedure-related complications. Median time of PRG tube placement was 16 minutes (range 13-21 minutes). Peak construct strength was significantly lower in the PEG group as compared to the low-profile PRG group (p=0.002) and the long PRG group (p=0.010).
Conclusions:PRG tubes had a greater peak construct strength than PEG tubes, and due to this increased load to failure, PRG tubes could be considered as an alternative option in larger patients. While gastrostomy tube placement was successfully performed with fluoroscopic-guidance in this cadaveric model, further evaluation in clinical patients is needed.

BIOMECHANICAL COMPARISON OF TWO PERCUTANEOUS GASTROPEXY TECHNIQUES FOR PERCUTANEOUS ENDOSCOPIC GASTROSTOMY TUBES

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Introduction: Percutaneous endoscopic gastrostomy (PEG) tubes are placed to allow enteral nutrition support in a variety of disease conditions. Myriad complications can occur during placement of PEG tubes or in the post-operative period, including early tube dislodgement resulting in septic peritonitis. The objective of this study was to evaluate two percutaneous gastropexy techniques for securing PEG tubes using biomechanical assessment and evaluation of procedure time.
Materials and Methods: Eighteen canine cadavers were assigned to one of three groups: PEG tube only, PEG tube with T-fastener gastropexy, and PEG tube with U-stitch gastropexy. Time to completion of placement of PEG tube and gastropexy was recorded. After placement, the stomach and left abdominal body walls were removed and biomechanical testing performed.
Results:T-fastener and U-stitch techniques required more force to induce failure than the PEG only technique (p=.016 and p=.006, respectively). Both techniques required more time than placing a PEG tube alone (p=.004 for both). There were no differences between groups for weight or sex.
Conclusions: Performing T-fastener or U-stitch gastropexy may decrease the risk of early PEG tube dislodgement in dogs. However, studies evaluating the techniques in live dogs are necessary to confirm this hypothesis. The extended procedure time to perform either of the percutaneous gastropexies was not clinically significant.

IDIOPATHIC RENAL HEMATURIA IN A 3 MONTH OLD LABRADOR RETRIEVER

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A 3 month old female intact Labrador retriever was presented with a two day history of lethargy and gross hematuria, following treatment for parvoviral enteritis. Initial examination of the dog revealed severe lethargy and a packed cell volume (PCV) of 18% with 4.0 g/dL total solids. A packed red blood cell transfusion was administered. Coagulation testing was within normal limits. Diagnostic imaging abnormalities included a small volume of peritoneal and retroperitoneal effusion and mild bilateral renal pyelectasia. The hematuria resolved while hospitalized, the patient was discharged with Clavamox, which was discontinued following a negative urine culture. Severe frank hematuria recurred two weeks after discharge. Computed tomography (CT) angiography was performed revealing left pyelectasia (8mm), left ureteral dilation (6mm), and narrowing of the left ureter at the ureterovesicular junction. Exploratory laparotomy was performed and renal hematuria was not noted from the ureteral orifices. A presumed diagnosis of idiopathic renal hematuria was made based on CT findings. Left renal sclerotherapy was performed with three 20 minute dwells at 1:1:3 dilution (1 of 5% povidone iodine, iohexol, 5% dextrose in water (D5W), and 2 of silver nitrate 1%, iohexol, D5W). Following sclerotherapy a 3.7Fr x 18cm pigtail ureteral stent was placed, and the abdomen was closed in a routine manner. The dog was discharged 36 hours postoperatively with resolution of hematuria. At one month postoperatively, the owners reported persistent pollakiuria, with no recurrence of hematuria. Abdominal radiographs confirmed appropriate ureteral stent position, and cystoscopic stent retrieval is scheduled for two months postoperatively.

INTERVENTIONAL MANAGEMENT OF A MEDIASTINAL PARAESOPHAGEAL ABSCESS

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Surgical treatment of mediastinal paraesophageal abscesses consists on performing medial or lateral thoracotomy to drain and debrided it involving a very aggressive surgery.
A 7 months Warren Hound male dog was remitted to our unit with sever respiratory difficulties. Clinical history showed a traumatic esophageal wound caused by a bone esophageal obstruction. The foreign body was removed by endoscopy, and immediately after the procedure the dog developed respiratory distress. CT study revealed a 14 x 7.7 cm mediastinal paraesophageal abscess.
A percutaneous drainage catheter was decided to be placed by ultrasound and fluoroscopically guidance using the Seldinger technique.
Under total anesthesia and intercostal blockage, the patient was positioned on right lateral recumbency. The abscess was punctured in the dorsal area under ultrasonographic guidance by a X G needle at the level of the 7thintercostal space. Correct position of the needle was confirmed by aspiration of purulent fluid. Through the needle a metallic 0.035” guidewire was introduced, and the access dilated with an 8F dilatator; finally, under fluoroscopy a 12Fr pigtail drainage catheter was placed at the distal abscess segment. Abscess was drained slowly to avoid pulmonary edema; 350 ml of purulent fluid was collected in 20 min. Immediately an improve of tidal volume was evident. The catheter was fixed dorsally, between the scapula and maintained during a week. 24 hours after intervention, the abscess was drainage again and was administrated 25,000 IU of urokinase to get fibrinolytic effect.
Percutaneous drainage is a safe and effective minimally invasive technique

PROGNOSIS FOLLOWING MULTIMODALITY MEDICAL MANAGEMENT ALONE OF CANINE TRACHEAL COLLAPSE SYNDROME (CTCS): SHORT-, INTERMEDIATE-, AND LONG-TERM RESULTS IN 84 CASES (2009–2018)

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Objective: To evaluate short, intermediate, and long-term outcomes following multimodality medical management alone for canine tracheal collapse syndrome (CTCS).
Design: Retrospective case series.
Animals: 84 dogs
Materials and Methods: Medical records of allCTCS dogs prescribed a multimodality medical regimen were included. Patients receiving endoluminal stents or extraluminal ring prostheses were excluded from further analysis. Medical records were reviewed for pertinent patient data, clinical scores, and survival outcomes. Clinical scores were divided into mild (1-3), moderate (4-7), and severe (8-10) categories.
Results: A total of 84 medically managed dogs with CTCS were included and followed for a median of 1,130 days (range 107-3,134 days). In the study population, 70 dogs had traditional-type tracheal collapse (TTC), 5 dogs had malformation-type tracheal collapse (MTC), and 9 dogs had CTCS of indeterminable type. At the last examination by phone or AMC visit, worsening of clinical signs for honking/raspy breathing, coughing, and dyspnea clinical scores was reported in 36.9%, 34.5%, and 47.6% of dogs despite medical management, respectively. Median survival time (MST) was 1,330 days (range 970-1,528 days) and older dogs (>8.8 years old) had a shorter MST of 893 days compared to younger dogs (P<0.01). Dogs with a severe clinical score in at least one category at last examination had a MST between 733 and 953 days.
Conclusions and Clinical Relevance: Multimodality medical management of CTCS alone, in the absence of endoluminal or surgical treatment, was associated with a median survival time of under 4 years in this population of dogs.

TOTAL FRACTURE OF TWO DIFFERENT-ShAPED TRACHEAL STENTS:

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Introduction: Tracheal collapse is a benign degenerative airway pathology with non accepted treatment results. Stenting high collapse grades is being the latest tendency, initial results seems to be satisfactory, however, complications such as stent fracture must be considered before patient intervention. The aim of this case report is to record a major complication of tracheal stenting and an option of treatment.
Material and Methods: A nitinol auto-expandable mesh-shaped stent was firstly implanted under fluoroscopic guidance. Systemic corticosteroids were maintained. On second month post-intervention symptomatology appears with more acute cough and exercise intolerance. Endoscopic exam showed multiple stent fracture. A second stent was placed; deploying a nitinol self-expandable laser cut stent to open the broken stent but not to exercise such radial force. The second stent was broken before a month, and symptomatology become worse. Under endoscopy control we remove out 5 stent pieces (first and second implanted) and inhaled corticosteroids treatment, twice a day, was indicated.
Results: Tracheal collapse medical management normally include systemic administration. In this case local administration obtained better results and controlled patient ´s symptomatology. Stenting over a broken stent has been previously described, but in this case the result was disastrous.
Conclusion: The cause of tracheal stent fracture is still unknown but must be consider as real complication. There is no other available solution for this patients, future research will be necessary. In our case inhaled corticosteroid gave better results than systemic ones and should be consider.

BACTERIAL INFECTION IN CANINE TRACHEAL COLLAPSE SYNDROME PRIOR TO, AND FOLLOWING, TRACHEAL STENT PLACEMENT.

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Background: Dogs with tracheal stents often have positive airway bacterial cultures. The pathogenicity of these infections and risk factors for infection have not been investigated.
Objective: To describe bacterial infection in dogs with traditional-type tracheal collapse (TTC) and malformation-type tracheal collapse (MTC) prior to and after tracheal stent placement, using cytological and radiographic findings as evidence of pathogenicity.
Animals: 53 client-owned dogs.
Methods: Retrospective review of medical records.
Results:There was no significant difference between the prevalence of dogs with positive bacterial cultures prior to (31/38; 82%) or after stent placement (24/31; 77%) (p= 0.669). Geriatric dogs (61%) and TTC dogs (62%) were both significantly more likely to have positive pathogenic cultures prior to stent placement (p=0.04 and p=0.04, respectively). Additionally, geriatric dogs (p=0.02) and TTC dogs (p=0.01) demonstrated significant reductions in positive pathogenic cultures following stent placement (53% reduction and 57% reduction, respectively). Significant risk factors for pathogenic infection included a history of pneumonia (OR= 3.6) and cardiac disease (OR= 1.25) in geriatric dogs, and hepatomegaly in young dogs (OR= 1.5).
Conclusions: Tracheal stent placement does not increase the overall rate of pathogenic bacterial infection in dogs with CTCS. Geriatric dogs and TTC dogs were more likely to have a pathogenic infection prior to stent placement, and both groups demonstrated reduced incidence of infections following stent placement. Due to the high number of pathogenic infections found, airway culture and cytology should be performed in all dogs undergoing tracheal stent placement.

LONG-TERM RESOLUTION OF CHYLOTHORAX SECONDARY TO A COMPRESSIVE RIGHT ATRIAL MASS AFTER TREATMENT WITH A VASCULAR STENT AND STEREOTACTIC BODY RADIOTHERAPY IN A DOG

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An 8-year-old male castrated rough collie was evaluated for persistent chylothorax. Cardiac ultrasound and computed tomography revealed a right atrial intra- and extraluminal mass with partial obstruction of the cranial vena cava (CrVC) and secondary chylothorax. Vascular stent placement was elected to alleviate CrVC obstruction and attempt to relieve chylothorax. The dog was anesthetized and right jugular vein accessed. Angiography of the CrVC and right atrium documented resistance to blood flow and a filling defect in the region of the mass. Wire-guided balloon catheters were passed to span the length of the filling defect and inflated to a maximal dilation of 14 mm. An 18 mm x 180 mm self-expanding stent was deployed in the region of the stricture. Repeat angiography demonstrated marked improvement in blood flow. No intra- or post-procedural complications were noted. An intrathoracic drainage catheter and subcutaneous port were placed within the right hemithorax to facilitate thoracic drainage. Antiplatelet therapy was initiated to decrease risk of stent-related complications. Four weeks later the dog underwent stereotactic body radiotherapy (SBRT) with three doses of 8 Gray each. Pleural effusion resolved until 4 months post-stent placement. At that time, the dog was diagnosed with supraventricular tachycardia and pleural effusion and was administered anti-arrhythmic therapy and anti-angiogenic/proliferative medication (PalladiaTM). Subsequent evaluations confirmed resolution of arrhythmia and pleural effusion (7 months post-stent placement). Treatment options such as combined stent placement and SBRT have not previously reported for a similar disease process to the authors' knowledge, but can be considered in future patients.

FLUOROSCOPIC-GUIDED PLACEMENT OF INTRATHORACIC DRAINAGE CATHETERS AND SUBCUTANEOUS PORTS: PROCEDURAL DESCRIPTION AND EVALUATION OF SHORT-TERM OUTCOMES

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Objective: To describe the placement of intrathoracic drainage catheters (IDC) and subcutaneous ports utilizing radiologic techniques and to report short-term outcomes in companion animals undergoing this technique.
Study Design:Case series
Animals:5 client-owned dogs 1 client-owned cat
Methods:IDC were placed utilizing a modified Seldinger technique with fluoroscopic-guidance; in short, an over-the-needle catheter was inserted into the thoracic cavity and a guidewire was inserted through the catheter. Once the guidewire was appropriately positioned, a peel-away sheath was inserted over the guidewire, and the IDC was placed over the guidewire into the thoracic cavity. A subcutaneous port was attached to the drainage catheter to facilitate aspiration. Medical records were reviewed and data regarding short-term outcome was recorded.
Results: Five dogs (median weight: 30 kg) and 1 cat (5.7 kg) underwent this procedure. IDC were placed within the right hemithorax in 4 dogs and the cat, and left hemithorax in 1 dog for the following reasons: chylothorax (n=2), malignant pleural effusion (1), pleural effusion secondary to right atrial thrombus (1), idiopathic pleural effusion (1), and pneumothorax (1). No intra- or post-procedural complications were encountered and no cases required conversion to a different technique. All animals were discharged within 1 day of IDC placement. Successful aspiration of fluid or air from the IDC was noted in every case.
Conclusions:Fluoroscopic-guided placement of IDC was successfully performed for a variety of diseases in this companion animal cohort. Short-term outcomes were encouraging with no complications occurring and effective aspiration of fluid and air.

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