

# PARAGONPRESS

ISSUE 2 SPRING 2020

## Cutting through the pain

Paragon advances  
in local analgesia



### CASE STUDY

Ureteral  
obstruction  
in a cat

### TOP TIPS

Optimising your  
diagnostics

# WELCOME

Welcome to the second edition of our Paragon Press newsletter.

It's now 2 years since Paragon Veterinary Referrals opened and in that time we have grown significantly.

Since joining in November 2018, we have added no fewer than five further diplomates to our team, in Orthopaedics, Oncology, Small Animal Medicine, Anaesthesia and Analgesia and Neurology. The addition of these first-rate clinicians is helping us along the road to becoming a truly multi-disciplinary service – but it is only a part of our recent successes.

Following our RCVS Practice Standards Scheme (PSS) inspection, we were delighted to be recognised as outstanding in no fewer than four categories - Team and Professional Responsibility, Diagnostic Service, Inpatient Service and Emergency and Critical Care Service.

In his comments, the RCVS assessor said we had produced “a centre to be proud of” and praised the feeling of pride and commitment among the staff. I see this commitment on a daily basis and it was wonderful to see it being recognised by the industry too.

The successes didn't stop there, as we were crowned the overall winner in the 2019 British Veterinary Hospital Association (BVHA) Design Awards, a biennial event held to reward excellence in veterinary practice and design.

We also picked up the top prize in the Conversion category, awarded to practices which have made use of buildings previously used for other purposes.

It was wonderful to finish the year in such a positive fashion and see the hard work of our exceptional team recognised time and again.

We have really enjoyed putting together this edition and hope that you enjoy reading it.

Sophie Adamantos

Clinical Director, Paragon Veterinary Referrals

## CONTENTS

P.3	CPD Programme 2020
P.4	We Read For You - Prazosin in feline urethral obstruction
P.5	Current opinion - Immunotherapy in dogs with Oral Melanoma
P.6-7	Optimising your diagnostics - Acute Pancreatitis
P.8	Paragon Recommends - Local Analgesia
P.9	Meet The Team - Nick Blackburn
P.10-12	Management of Ureteral Obstruction in a Cat
P.13	Clinical Trials - Recent Publications
P.14-15	Sheldon and Brodie



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## Committed to excellence

# CPD PROGRAMME

## NURSING SKILLS CLUB - NEW FOR 2020

### Monday 20th April 2020 - Enteral nutrition & feeding tube management

Speaker - Lydia Barry, Ward Team Leader BSc (Hons) degree RVN

Nutrition should be considered for every patient entering the veterinary hospital. Learn about the variety of diets, methods and techniques for administering enteral nutrition to patients in a holistic way.

### Monday 11th May 2020 - Maintaining and using urinary catheters

Speaker - Lydia Barry, Ward Team Leader BSc (Hons) degree RVN

Nurses play a crucial role in the placement, maintenance and monitoring of indwelling urinary catheters placed in hospitalised patients. Correct cleaning, handling and monitoring are essential skills.

### Friday 5th June 2020 - How to perform CPR

Speaker - Fiona Wilson, RVN Registered Veterinary Nurse

CPR is something we should all be confident in, and when such a situation arises, act quickly and efficiently. This talk will discuss some scenarios which may lead to a crash situation and demonstrate how to provide effective CPR.

### Thursday 13th August 2020 - Endoscope care master class

Speaker - Nicolas Coleman, RVN Registered Veterinary Nurse

Endoscopic procedures require extensive Veterinary Nurse involvement. This CPD will cover how to set up for procedures, how to assist the Veterinary Surgeon and how to clean, maintain and care for different types of endoscopes within the practice.

### Thursday 10th September 2020 - Instrument workshop

Speaker - Rebecca Fray, RVN Registered Veterinary Nurse Surgical Team Leader and Dan Kenny, BVSc MRCVS Surgery Intern

This workshop will cover different types of instruments and what they are used for. The do's and don'ts of instrument care to avoid upsetting your surgeons! How to correctly package and sterilise instruments.

### Thursday 15th October 2020 - Radiography interpretation for nurses

Speaker - Rebecca Fray, RVN Registered Veterinary Nurse Surgical Team Leader

It's just different shades of grey! What stifle effusion?! How to interpret radiographs and impress your vets! After this session hopefully you will be able to interpret X-rays with confidence.

## VET CLINICAL CLUBS CPD

### Thursday 21st May 2020 - Haematology

Speaker - Andrea Holmes, BSc BVSc DipECVIM- CA MRCVS Internal Medicine Clinician, EBVS® European Veterinary Specialist in Small Animal Internal Medicine

The session will look at blood smear evaluations and interpretation of haematology results. We will also cover bone marrow sampling and bone marrow interpretation.

### Wednesday 10th June 2020 - Biochemistry clinical conundrum

Speaker - Ben Safrany BVetMed PgC in Small Animal Medicine MRCVS Internal Medic

This CPD will combine revision of the principles of interpreting biochemistry results in dogs and cats along with practical case-based discussions as part of a small group.

- Blood proteins
- Calcium
- Electrolytes
- Urea and creatinine
- Phosphate
- Liver enzymes
- Bilirubin
- Glucose
- Cholesterol
- Pancreatic lipases
- GI specific blood testing
- Errors

### Thursday 22nd October 2020 - Lower urinary tract case discussion (for submitted cases) followed by a talk on urolithiasis

Speaker - Andrea Holmes, BSc BVSc DipECVIM- CA MRCVS Internal Medicine Clinician, EBVS® European Veterinary Specialist in Small Animal Internal Medicine

Please submit your challenging lower urinary tract cases from your clinic so we can discuss these as a group. We will consider the pathophysiology, approach to diagnostics, management and which cases would benefit from referral. Depending on how long this discussion takes we will then talk about urolithiasis in dogs and cats. For Andrea to prepare the case discussions effectively she requires full clinical history, lab results and imaging findings alongside a case summary or at least a list of questions the vet has considered/wants to discuss by the 9TH October to [Rachel.Tomlinson-Leyden@paragonreferrals.co.uk](mailto:Rachel.Tomlinson-Leyden@paragonreferrals.co.uk)

## RECEPTION SKILLS

### Thursday 25th June 2020 - Enhance the support you give to bereaved pet owners

Speaker - Nicola Challice, Credit Controller

Understand the bereavement process and ways of reframing the situation. Manage the client expectation and ensure they have a positive outcome in a sad situation.

Numbers are strictly limited to 16 delegates per event so early booking is recommended. These events are informal and friendly, in a relaxed environment, providing ample opportunity to engage with our speakers and with our wider team when touring the centre.



To see all our CPD events and book places visit [paragonreferrals.co.uk/cpd](http://paragonreferrals.co.uk/cpd)  
All events will be held at Paragon Veterinary Referrals, Red Hall Crescent, Wakefield, WF1 2DF.

# WHAT'S NEW?

WE READ FOR YOU

Welcome to 'We Read For You'. This feature highlights recently published papers from a Veterinary Journal and presents the take-home message concisely, allowing you to catch up on recent evidence in a tea break.

## The effect of prazosin on outcome in feline urethral obstruction

**Aims:** To determine whether administration of prazosin (Hypovase) at 0.25mg/cat every 12 hours to cats that have had urethral obstruction is associated with a reduced risk of recurrent urethral obstruction or other lower urinary tract signs.

**Study design:** A sample size calculation indicated that 28 cats were required in each group to detect a reduction of re-obstruction from an estimated 50% to 12.5%. Cats were initially managed for urethral obstruction using a standardised protocol. Cats were excluded if the owner stated they were unable to administer oral medication, if there were urinary calculi, chronic kidney disease, heart disease or prior medication with vasoactive therapies. Cats with indwelling urinary catheter prior to presentation were also excluded. Cats were randomised to receive placebo or treatment for 1 month. The treatment was started as soon as the cat was able to receive oral medication. Cats were discharged with standardised discharge instructions including behavioural modification, nutritional advice and husbandry recommendations. Follow up was performed weekly for 1 month and then at 6 months and included compliance, adverse events, evidence of lower urinary tract signs measured using a Likert scale, occurrence of re-obstruction, surgical intervention, euthanasia or death.

**Key results:** 72 cats were initially enrolled and 25 of these excluded. A total of 47 cats were randomised to treatment. There were 20 in the placebo group and 27 in the treatment group. Following randomisation 2 cats were withdrawn, 1 from each group.

Patient demographics were similar between groups. Cats that received prazosin had a statistically shorter period of catheterisation (32 vs 39 hours) and hospitalisation (37 vs 46 hours) than those that were in the placebo group.

Owner compliance was not different between the 2 groups. Compliance with dietary and husbandry recommendations was similar between groups.

Side effects were mild in both groups and did not result in stopping medication.

Three cats re-obstructed prior to discharge with no difference between groups.

Re-obstruction rate in the 1 month study period was 15% in

the prazosin group and 17% in the placebo group. This is not statistically different.

Four cats (2 from each group) re-obstructed within 1 month.

In the 6 month follow up period 12 cats were lost to follow up. Of the remaining 25 cats 4 had re-obstructed, 3 in the prazosin group and 1 in the placebo group.

Total re-obstruction rate was 37% in the prazosin group and 31% in the placebo group. 27% of these cats were euthanased.

All owners reported straining at 1 week follow up with no difference between the groups.

**Clinical relevance:** At this dose prazosin does not reduce the risk of subsequent re-obstruction or lower urinary tract signs. This study was underpowered due to the lower than expected re-obstruction rate during the 1-month study period. There are 2 ways to interpret this; one is that there are not enough cats to know whether it works, the other is that it doesn't work at this dose. Post-hoc power calculations suggest that 1149 cats in the prazosin group and 766 cats in the placebo group would have been needed to identify an effect.

Based on this work, if your re-obstruction rate is similar to that in the study population then it is likely that there will be minimal benefit associated with administering prazosin at this dose to cats. Further prospective work needs to be done to identify whether higher doses or frequency of administration may be effective as identified in a previous retrospective study (Hetrick and Davidow, 2010). There is a low risk of side effects and these are mild. At this dose hypotension was not identified.

### What next?

Do you know your re-obstruction rate with urethral obstruction? Audit your cases to work it out. What is your protocol for de-obstruction? If your re-obstruction rate is high, perhaps it is worth reviewing this paper in more detail to see whether adjusting your de-obstruction protocol will benefit your patients.

What medications do you use in your patients? Audit whether these are effective. Are they having the desired effect of reducing your re-obstruction rate to an acceptably low level?

# Immunotherapy Oral High-Grade Melanoma in the Dog



## AUTHOR Rodney Ayl

BSc BVSc MRCVS Diplomate ACVIM (Oncology)  
Diplomate ACVR (Radiation Oncology)  
Oncology Specialist

Melanoma is the most common oral tumour in dogs but is also a relatively common tumour in many other sites and species. Prognosis of the oral form of this cancer in dogs depends upon several indicators including:

- 1) The size of the tumour (<2cm approximately 511 median survival vs >2cm with 164 days)
- 2) Spread to lymph nodes or lungs (angiolymphatic invasion) – Staging tests Site of the tumour (tumours along gumline or lip may not be as malignant; local invasion into bone)
- 3) Ability of 1st treatment to provide adequate local control with surgery and/or radiation therapy (meaning recurrent tumours do worse than tumours treated and removed the first time)
- 4) Proliferation indices of the tumour (how aggressive it appears histologically - mitotic index?).

These indicators, along with the results of the staging, help us to determine which modality/ies of therapy is best for each animal and each tumour. Treatment options typically consist of surgery to remove the primary tumour possibly followed by radiation therapy to clean up residual disease and then chemotherapy and/or immunotherapy.

Surgery is the mainstay of treatment, but surgery alone has not been shown to cure dogs as most dogs develop and die of metastatic disease within 6-12 months. Because of this we recommend follow up with chemotherapy if there is evidence of systemic spread and now targeted immunotherapy to attempt to control systemic spread of the cancer.

Radiation therapy is indicated in cases where the tumour was not or cannot be completely removed where it can attempt to eliminate residual disease at the initial site of surgery. It can also be used as the primary local therapy where surgery is not feasible or not chosen

by the owner. It helps to provide good local control, but it will still need to be followed with chemotherapy and/or immunotherapy because of the aggressive metastatic nature of this cancer. As compared to conventional radiation therapy protocols, the treatment for melanoma, which exhibits intrinsic resistance to radiotherapy, is different. Here the radiotherapy uses large doses that are given 1-3 x/week for 3-5 treatments. The goal of this 'palliative' therapy is to slow the growth of the tumour and make the animal more comfortable, though several studies have shown that this coarse fractionation radiation therapy can result in significant clinical responses in melanoma.

Chemotherapy may be recommended regardless of the type of local therapy, in an attempt to control systemic spread of the cancer, though responses are rare and poor. Historically, we have used carboplatin, although based on cases where the tumour is too large to remove, chemotherapy (carboplatin) alone has only been able to provide an objective response and shrink tumours, about 30-35% of the time. Newer molecularly targeted drugs like toceranib may provide improved response rates in this tumour type.

Immunotherapy specifically targeted for treatment of melanoma is provided by a DNA vaccine that has been marketed for the treatment of melanoma and has been considered a breakthrough for this cancer. The vaccine is documented to extend survival times of dogs with stage II or III oral melanoma where local disease control has been achieved (negative local lymph nodes or positive lymph nodes that were surgically removed or irradiated). The vaccine is administered percutaneously and needleless, using compressed air to administer the gene for human tyrosinase (which codes for the enzyme that produces melanin) into the muscle of dogs. The human gene is considered foreign and the dog's immune system recognises it as such and mounts an immune response against it. The immune response then carries over and allows the patient's immune system to recognise the melanoma cells as foreign and will direct a continuous attack against the cancer cells.

Studies have shown excellent responses in dogs with their survivals extended by years in many cases. There are no known contraindications for the use of this product in dogs with oral melanoma. In rare instances, administration of vaccines may cause lethargy, fever, and inflammatory or hypersensitivity types of reactions. The vaccine protocol involves 4 treatments on an every other week basis with a booster every 6 months and is available at Paragon Veterinary Referrals in Wakefield.



## Authors

Reineke, E. L., Thomas, E. K., Syring, R. S., Savini, J. and Drobatz, K. J.



## Reference including DOI

Journal of Veterinary Emergency and Critical Care, 2017 27: 387-396. doi:10.1111/vec.12611



## Type of Study

Double-blinded, prospective, interventional study.



## REVIEWER

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## Reference:

Peter F. Hetrick and Elizabeth B. Davidow (2013) Initial treatment factors associated with feline urethral obstruction recurrence rate: 192 cases (2004-2010) *Journal of the American Veterinary Medical Association* 243:4, 512-519

# Optimising Your Diagnostics

This monthly series will highlight diagnostics used in practice and help you to understand how to best use these in clinical cases.



## Diagnosis of Acute Pancreatitis in dogs

Canine pancreatitis is well recognised as a common disease in dogs and is likely a spectrum of disease. It may manifest as acute pancreatitis, defined as a fully reversible inflammation of the pancreas with the histological findings of oedema, neutrophilic infiltrate and necrosis. Chronic pancreatitis is characterised by continued inflammation with irreversible changes such as fibrosis.

Canine pancreatitis can be a challenging diagnosis to make as clinical signs are non-specific and clinical signs, laboratory and ultrasound findings may be conflicting, making diagnosis challenging.

## The clinical presentation

This can range from subclinical, chronically affected cases to severely affected acute cases. Typical signs seen in acute pancreatitis include vomiting, abdominal pain, lethargy and dehydration. Some cases will show signs of diarrhoea and pyrexia. Systemic complications are reported and associated with a poorer prognosis, these include acute kidney injury, pulmonary failure and disseminated intravascular coagulopathy (DIC).



### AUTHOR

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## Radiography

This can reveal decreased contrast in the cranial abdomen and displacement of abdominal organs. However, these changes are subjective and abdominal radiography is insensitive and non-specific for pancreatitis. Radiography is an important test in dogs with acute vomiting and abdominal pain to rule out other differential diagnoses such as foreign bodies.

## Abdominal ultrasonography

This can be useful for the diagnosis of pancreatitis. The sensitivity of ultrasonography is dependent on the equipment available, the experience and skill of the operator and the severity of the disease. Ultrasonographic findings in acute pancreatitis include hypoechoic areas of the pancreas, pancreatic enlargement, hyperechoic peripancreatic fat and mesentery, an enlarged duodenal papilla or dilated pancreatic duct.



## A complete blood cell count and serum biochemistry

This may reveal a variety of non-specific changes, however, none are diagnostic of pancreatitis. These tests are useful to rule out other differential diagnoses and to screen for co-morbidities. suspicion should prompt further diagnostics e.g. Baermann examination.

## Serum amylase activity

This may be increased in some dogs with pancreatitis, but not others. Because amylases are present in other tissues and excreted by the kidney, increased serum amylase may be seen in a variety of other conditions including renal failure. For this reason, it is of little value in the diagnosis of pancreatitis in dogs.

## Total serum lipase activity

This includes gastric, pancreatic, hepatic and hormone-sensitive lipase. It can be measured by a variety of methodologies, however, most assays have a limited specificity (around 50%) for the pancreas and a sensitivity of approximately 50% for pancreatitis.

More recently, an assay of 1,2-o-dilauryl-rac-glycero-3-glutaric acid-(6'-methylresorufin) ester (DGGR) has been validated for use in dogs. In a recent study of 142 dogs suspected of having pancreatitis a strong correlation was found between DGGR lipase and Spec cPL.<sup>1</sup> It has previously been suggested that this test had a relatively greater sensitivity but lower specificity when compared to more specific lipases, potentially making it a valuable screening test.<sup>2</sup> However other supportive diagnostics are required to make a definitive diagnosis.

## Spec cPL (canine pancreatic lipase immunoreactivity)

This is a specific assay that can measure pancreatic lipase exclusively. This assay reports a sensitivity of greater than 80% for acute pancreatitis, making this reportedly the most sensitive test currently available for canine pancreatitis. A patient-side semi-quantitative SNAP® cPL™ test is available from IDEXX. The high sensitivity of the test means that it is useful to rule out pancreatitis when the test is negative. Due to its lower specificity, a positive result should be confirmed by quantitative measurement of spec cPL at a reference laboratory and to provide a baseline value for further monitoring.

## Trypsin-like immunoreactivity (TLI)

This has a much lower sensitivity than cPL concentration or abdominal ultrasound. Serum TLI concentration is the test of choice for diagnosing exocrine pancreatic insufficiency but is no longer recommended for diagnosis of acute pancreatitis.

## Cytology

Cytology of fine needle aspirates of the pancreas has been shown to be a safe and effective means of confirming a diagnosis of pancreatitis. However, false negative results are present in patients with pancreatic necrosis and localised disease. This method is not recommended routinely.

## Histopathology

Samples collected at laparotomy, or laparoscopically can be used to confirm pancreatitis. As with cytology false negative results are possible in cases with localised disease. Risk benefit analysis should be considered prior to surgical biopsy of the pancreas as intraoperative hypotension may worsen pancreatitis.



## In summary

In summary, the diagnosis of pancreatitis is challenging. Ideally, a correlation of clinical signs, diagnostic imaging and appropriate use of concentrations of pancreatic specific lipase, with the elimination of other differential diagnosis should be used to support a diagnosis of pancreatitis. No single test can be relied on currently as there is no test with optimal sensitivity and specificity. In addition, false positives are seen commonly with diseases affecting the gastrointestinal tract e.g. foreign body obstruction and peritonitis.<sup>3</sup>

1 Kook, P. H. et al. (2014) 'Agreement of Serum Spec cPL with the 1,2-o-Dilauryl-Rac-Glycero Glutaric Acid-(6'-methylresorufin) Ester (DGGR) Lipase Assay and with Pancreatic Ultrasonography in Dogs with Suspected Pancreatitis', *Journal of Veterinary Internal Medicine*, 28(3), pp. 863-870.

2 Graca, R. et al. (2005) 'Validation and diagnostic efficacy of a lipase assay using the substrate 1,2-o-dilauryl-rac-glycero glutaric acid-(6'methyl resorufin)-ester for the diagnosis of acute pancreatitis in dogs', *Veterinary Clinical Pathology*, 34(1), pp. 39-43.

3 Haworth, M. D. et al. (2014) 'Diagnostic accuracy of the SNAP and Spec canine pancreatic lipase tests for pancreatitis in dogs presenting with clinical signs of acute abdominal disease: SNAP cPL in dogs with acute abdominal disease', *Journal of Veterinary Emergency and Critical Care*, 24(2), pp. 135-143.



## Local analgesia - Cutting through the pain

With the arrival of Liz Leece, our specialist in anaesthesia and analgesia, Paragon are reviewing post-operative pain relief and how to manage both our routine and more difficult cases.

Local analgesia is at the forefront of our analgesia and reliably improves recovery quality and reduces the need for opioid analgesia, which themselves can cause side effects such as decreased appetite and sometimes dysphoria (Bini et al. 2019).

Previously, peripheral nerve blocks were performed either using the 'blind technique' utilising anatomical knowledge and injecting local in the area of the nerves to be blocked. More recently, nerve locators have been used at Paragon for limb blocks. These use a small electrical current delivered to the tip of our needles to locate the motor nerves more effectively and deliver local anaesthetic in close proximity to the nerves. For many of the nerve blocks, however, it is important to deliver the block within the fascial planes that the nerves run through and so the use of ultrasound guidance allows more precise delivery and complete blockade of the sensory nerves.

Our Christmas present to all our surgical (and some of our medical) patients was a state-of-the-art ultrasound machine designed specifically for superficial and deep nerve blocks. This means we can provide more effective immediate post-operative analgesia for our patients and minimise the need for further pain killers. The nerves can be directly visualised and local anaesthetic directly placed around the nerve bundles. It also means that we can block the sensory nerves as opposed to having to always block motor nerves

in conjunction with the sensory blockade so our dogs and cats can use the leg immediately post-operatively.

Another benefit of the ultrasound machine is its use in providing analgesia for the abdominal wall and viscera which is obviously important in surgical abdominal procedures but can make all the difference for dogs and cats suffering from pancreatitis and ileus secondary to septic peritonitis. We hope to publish some clinical research on these patients to demonstrate our clinical impression of their effectiveness in patient management.

Our trained nurses play an integral role in assessing pain in the post-operative period in all our patients hospitalised overnight and providing analgesia under our veterinary care.

We aim to provide the most effective and targeted analgesia we can at Paragon and will be providing CPD for local practitioners and nurses to learn techniques and protocols that can be utilised in general practice. We have now also opened our chronic pain management clinic and Liz is happy to talk about any problem cases you may have.

Liz will be talking in the nursing stream at BSAVA Congress 2020 in Birmingham on Thursday 2nd April on "What's new in pain recognition and scoring in dogs and cats".

### Supportive reading material

**J. Feline Med. Surg., 2015 vol. 17(2) pp. 110-6.** Analgesic effects of maxillary and inferior alveolar nerve blocks in cats undergoing dental extractions. Aguiar, J; Chebroux, A; Martinez-Taboada, F; Leece, EA. <https://tinyurl.com/wmmpcmf>

**Vet Anaesth Analg, 2014 vol. 41(5) pp. 445-58.** Analgesia for pelvic limb surgery. A review of peripheral nerve blocks and the extradural technique. Gurney, MA; Leece, EA. <https://tinyurl.com/u7z18zg>



## MEET ONE OF THE TEAM

# Nick Blackburn

In every Paragon Press newsletter, we'll be meeting a member of the team and finding out a bit more about them. A big thanks to Nick Blackburn, one of our orthopaedic surgeons, who is our featured member of staff for the first newsletter of 2020.

### Veterinary Specific

What is your area of expertise/specialism?

General orthopaedic surgeon. I am building my skills in total hip replacement surgery and enjoy trauma cases.

How long have you been with the company? Started with Calder in March 2012, transferred to Paragon at the beginning in Feb 2018.

Describe your role in three words

Fixing broken pets.

What is your top tip for someone starting out in the industry?

Spend some time finding your feet and don't be afraid.

What's the best advice you've ever heard?

As a student we were told that we would never see pets the same way again. It's true that you always look at other people's dogs whilst out and you spot problems that the owner may be unaware of. It would be great if owners could see this so we could treat their pets earlier.

What's the coolest thing you are working on right now?

Nothing specific.

What is your most-loved animal?

Leopards.

What is your perfect pet?

A friendly playful cat (Burmese probably).

If you could be any animal, what would you be?

Some form of eagle. Amazing eyesight and would love to be able to fly.

### General Knowledge

What is the last book you read?

Skeptics' Guide to the Universe.

What did you want to be when you were a kid?

A vet.

What three people (can be alive or deceased) would you invite to your dream dinner party?

Nikolai Tesla, Brian Cox, David Attenborough.

What is your favourite (clean!) joke?

Can't think of any.

What is your favourite film?

Depends on mood but Star Wars, Predator, Akira, Spirited Away, The Thing.

What was the first thing you bought with your own money?

Can't remember but probably a car.

Name one thing you want to achieve this year.

Finish most of my house renovation project.

## CASE STUDY

Ureteral Obstruction  
in Cats

A 4 year old domestic long-haired cat presented to Paragon Referrals for investigation and management of acute kidney injury. She had initially presented to her vet with severe azotaemia 3 months previously, and although there had been some improvement with medical management she had ongoing azotaemia and imaging had identified the presence of mineralised obstructions within the right ureter. She was referred to Paragon Referrals for investigation and further management.

On presentation the cat was quiet and in thin body condition 2/9 weighing 2.9kg. Her kidneys were asymmetric with the right slightly larger than the left. There was mild dehydration (approx. 5%). The remainder of the physical examination was unremarkable. Initial blood work

revealed azotaemia and severe ionised hypercalcaemia. Her electrolytes were normal.

Imaging of the urinary tract identified a normal left kidney. The right kidney demonstrated pelvic dilation and 2 mineralised ureteral obstructions in the proximal ureter.

## WHAT IS URETERAL OBSTRUCTION?

Ureteral obstruction is an increasingly recognised cause of acute kidney injury in cats. The obstruction can be unilateral or bilateral, when azotaemia is present then bilateral disease should be suspected. The obstruction can be blocked by a stone (most common), a blood clot or as a result of stricture and can be associated with an abnormal course of the ureter. The most common type of stone seen is calcium oxalate and some of these cats are hypercalcaemic. As the cat's ureter is very small (2mm in diameter) ureteral obstruction is very challenging to manage.



When the ureter is completely obstructed, post-renal kidney failure occurs resulting in azotaemia. If this is unilateral the signs may be very subtle and azotaemia may not occur. Ureteral obstruction is associated with non-specific clinical signs including weight loss, polydipsia, vomiting, hyporexia and sometimes pain over the back. Chronic unilateral obstruction may be associated with no clinical signs. Eventually there will be complete failure of this kidney and fibrosis/shrinkage of the affected kidney. Cats will then present when the other ureter become obstructed. This is sometimes referred to as 'big kidney-little kidney'. At this point rapid treatment is required to prevent ongoing injury to the surviving kidney and severe, irreversible chronic kidney disease.

## TREATMENT

There is no 'fix' for this problem. We can manage the disease and surgical techniques will prolong life expectancy, but cats will require

frequent re-examination and interventions.

In this case there was only mild dehydration and the cat was otherwise stable. If there is bilateral disease the cats can be severely unwell and have significant hyperkalaemia representing anuria. Prior to further management cats should be stabilised.

There are 2 main ways of managing ureteral obstruction; medical and surgical. Surgical management is more effective and more likely to lead to recovery of the kidney. If the condition is managed medically there is a higher chance of irreversible kidney failure. Surgery is complicated and it is usually recommended that it is carried out by a specialist surgeon who has done the procedure before. If the renal pelvis is very small it is very difficult to manage the condition surgically. The bigger it is the easier it is to place the device.

In the case described the renal pelvis was considered to be borderline in terms of surgical management being achievable. As the azotaemia was chronic by the time of referral, the amount of recovery was also uncertain.



Owner counselling in these cases is vitally important. The ultimate aim of treatment is to reverse the obstruction and restore kidney function. As the azotaemia had been present for a number of months prior to presentation the likelihood of completely reversing the kidney injury was unlikely, however it should be possible to prevent ongoing kidney injury by ensuring further obstruction does

not occur. As the cat was stable medical therapy was attempted as outlined below.



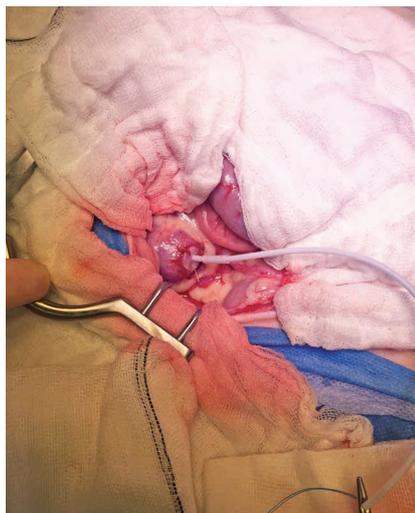
## MEDICAL MANAGEMENT

The aim of medical treatment would be to encourage the obstruction to move down the ureter into the bladder. Due to the small size of the ureter this is difficult. Medical treatment includes intravenous fluid therapy and diuretics to increase urine output, and smooth muscle relaxants to help the ureter relax so the stone can move. One retrospective study of medical management showed that 13% of cats had significant improvement in kidney function at the time of discharge, with 57% of these cats having documented stone passage from the ureter to the bladder. However, 30% of cats in the same study did not have a significant improvement in kidney function with medical management despite documented stone passage in most of these cats. In people smooth muscle relaxants are most effective when the stone is small (<5mm in diameter). Medical management is not a long-term option as many cats are at risk of ongoing or further obstruction. If there is evidence of symptomatic urinary tract infections antibiotics may be indicated. Long-term medical management may include the use of dietary manipulation and or other therapies to manage hypercalcaemia (if present).

Unfortunately there was no improvement in the cat's obstruction and serial monitoring of the renal pelvis over the next 2 days demonstrated on-going and worsening dilation and so surgical intervention was planned and carried out.

## SURGICAL MANAGEMENT

Direct removal of the obstruction is very rarely performed in cats as ureteral surgery is associated with a high rate of strictures and complications. A number of surgical methods have been used historically to manage ureteral obstruction including re-implantation and ureteral stent placement. Stents are no longer recommended as the short- and long-term outcomes are poor. Ureteral implantation is technically demanding and not suitable except in very distal obstructions which may be amenable to medical management.



The current recommended surgical treatment is the use of a subcutaneous ureteral bypass system (SUB). This provides a bypass to the artificial ureter and connects the kidney to the bladder through a system of tubes. The tubes meet at a port under the skin which is accessible and allows long-term flushing of the whole system. In order to place this device the renal pelvis needs to be a minimum of 2mm and preferably over 5mm as with very small dilations (which is often seen in acute obstructions) the technique needs to be modified.

Surgical management is recommended as soon as practically possible to ensure that as much kidney function can be preserved as possible. Placement of the tube takes place during open laparotomy and uses fluoroscopic guidance which allows assessment of the ureters and ensures accurate placement of the nephrostomy tube.

## AFTERCARE

If surgery goes to plan, the cat will stay in the hospital for 2-3 days afterwards to ensure all is progressing well. Monitoring of creatinine will usually be performed to identify improvements in kidney function.

Regular check-ups should be carried out, initially at 7-10 days. Further checks at 1, 3 and then every 3 months are needed to check the device is still working, obtain urine samples, monitor renal function and flush the device.

## OUTCOME

The aim of surgery is to recover as much kidney function as possible and to provide a bypass should any more obstructive events form. In most cats there is improvement in kidney function. Survival times of up to 10 years have been reported. Kidney function at 3 and 6 months is associated with long-term outcome.

## COMPLICATIONS

Complications associated with surgery include leakage of urine from the kidney or the bladder which can be difficult to manage. Other surgical complications include kinking or blockage of the tubes. There is a 7-25% risk of urinary tract infections after placement of the device. Infection can be difficult to manage due to the presence of the device in the kidney/bladder. About 10% of cats will have problems with urination (cystitis or pain). About 25% of tubes will become blocked over time, but not all of these will need to be changed.

## OUTCOME IN THIS CASE

Surgery went well, there was a reduction in renal pelvis

diameter after surgery, however unfortunately there was limited improvement in kidney function, with only a mild (approx. 20%) reduction in creatinine. Over the last year we have monitored the cat and performed 3 monthly flushes of the system. She has had no complications and there has been stability of her kidney function over the last year, she is currently IRIS Stage 3 and her creatinine is the same as post surgery. Management of hypercalcaemia has been challenging and therapy was attempted with bisphosphonates and corticosteroid with minimal effect. Ultimately a change of diet to a senior rather than renal diet resulted in normalisation of calcium and this has remained normal over the last 4 months. Most pleasingly she has gained significant body weight of 0.9kg and condition, now 5/9 and is happy, bright and behaving normally at home.



## CONCLUSIONS

Ureteral obstruction should be considered a cause of acute azotaemia in cats. Imaging should be performed to assess whether there is evidence of renal pelvic dilation as this could indicate that surgical management would be beneficial. Early surgical intervention is recommended. If you are suspicious we would recommend you speaking to one of our Specialists as soon as possible.

# CLINICAL TRIALS

## UPDATES ON RECENT PUBLICATIONS

### SOPHIE ADAMANTOS

<https://orcid.org/0000-0002-9494-7793>

#### 1. Ligament Laxity in Nonerosive Immune-Mediated Polyarthritis in Dogs: Five Cases (2009–2017).

Whitworth, F., Adamantos, S., Frowde, P., Whitelock, R., and Black, V.L. (2019)

*Journal of the American Animal Hospital Association: July/August 2019, 55,4,210-214.*

#### 2. Grit score and its relationship to successful enrolment in specialist veterinary training.

Barfield, D., Adamantos, S. (2018)

*Veterinary Record 183, 718. doi: 10.1136/vr.104991*

#### 3. Pyrexia in juvenile dogs: a review of 140 referred cases.

Black, V.L., Whitworth, F.J.S. and Adamantos, S. (2019)

*J Small Anim Pract 60: 116-120. doi: 10.1111/jsap.12938*

#### 4. Spontaneous haemothorax in juvenile dogs: a case series.

Stallwood J., Allen S., Allerton F., Adamantos S., Black V (2019)

*Companion Animal Vol. 24, No. 1Medicine https://doi.org/10.12968/coan.2019.24.1.14*

### DAVID BARKER

<https://orcid.org/0000-0001-7502-2296>

#### 1. Survey of UK-based veterinary surgeon's opinions on the use of surgery and chemotherapy in the treatment of canine high-grade mast cell tumour, splenic haemangiosarcoma and appendicular osteosarcoma.

D. A. Barker, R. D. Foale, M. A. Holmes, J. L. Demetriou. (2016)

*Veterinary Record; doi: 10.1136/vr.103479*

#### 2. Sublingual infiltrative lipoma in a dog mimicking a ranula.

L. M. Moris, D. A. Barker, O. Taeymans, J. L. Demetriou. (2017)

*Veterinary Record Case Reports; doi: 10.1136/vetreccr-2017-000506*

#### 3. Magnetic resonance imaging evaluation of olfactory bulb angle and soft palate dimensions in brachycephalic and nonbrachycephalic dogs.

D. A. Barker, C. Alonso, O. Taeymans, J. L. Demetriou. (2018)

*American Journal of Veterinary Research 79 (2), 170-176.*

#### 4. Fluoroscopically guided wide bore thoracostomy tube placement: a description of technique and comparison to blind placement.

D. A. Barker, T. Trinterud, J. L. Demetriou. (2018)

*Veterinary Surgery 1-6; doi: 10.1111/vsu.13106.*

#### 5. Axis Dorsal laminotomy in Dogs: A retrospective analysis of 10 cases.

D. A. Barker, V. Palus, S. Eminaga, G.B. Cherubini. (2018)

*Veterinary Record Case Reports;doi: 10.1136/vetreccr-2017-000574.*

### MICKEY TIVERS

[orcid.org/0000-0001-7047-9334](https://orcid.org/0000-0001-7047-9334)

#### 1. Effect of prophylactic treatment with levetiracetam on the incidence of postattenuation seizures in dogs undergoing surgical management of single congenital extrahepatic portosystemic shunts.

Mullins RA, Sanchez Villamil C, de Rooster H, Kummeling A, White RN, Thieman Mankin KM, Tivers MS, Yool DA, Anderson DM, Pratschke KM, Gordo I, Brissot H, Singh A, Olive M, Billet JP, Selmic LE, Kirby BM. (2019)

*Veterinary Surgery 48: 164- 172. doi: 10.1111/vsu.13141*

#### 2. Health-related quality of life following surgical attenuation of congenital portosystemic shunts versus healthy controls.

Bristow, P., Lipscomb, V., Kummeling, A., Packer, R., Gerrits, H., Homan, K., Ortiz, V., Newson, K. and Tivers, M. (2019)

*J Small Anim Pract, 60: 21-26. doi: 10.1111/jsap.12927*

#### 3. Long-term outcome of female dogs treated with static hydraulic urethral sphincter for urethral sphincter mechanism incompetence.

Gomes, C., Doran, I., Friend, E., Tivers, M., and Chanoit, G. (2018)

*Journal of the American Animal Hospital Association 54:5, 276-284*

*doi: 10.5326/JAAHA-MS-6709*

CONGENITAL DEFECT IN

# SHELDON

COMPLICATES A CASE OF SEPTIC PERITONITIS

Sheldon, a seven-year-old Labrador, had a history of osteoarthritis and had been receiving nonsteroidal anti-inflammatory drug treatment (NSAID) for four years when he was first referred to us.

Investigations by the referring vet identified suspected cardiomegaly and anaemia, after his owners reported him being lethargic, reluctant to go for walks and off his food.

On presentation, Sheldon was found to have a small amount of fluid around the heart and in his abdomen which, when tested, revealed septic peritonitis and septic pericardial effusion.

A CT scan was performed, where the omentum was seen within the pericardium, and a diagnosis of a pericardio-peritoneal diaphragmatic hernia (PPDH) was made.

Surgery was recommended as the cause of septic peritonitis in dogs is often due to rupture of the stomach or intestines.

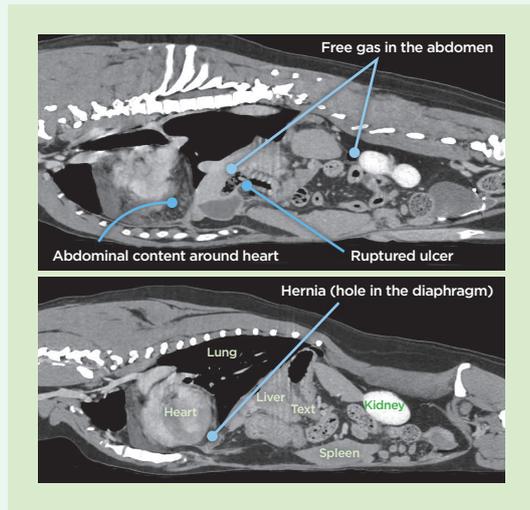
One week after surgery, Sheldon re-presented to us with recurrent pericardial effusion. This fluid accumulation causes a problem as pressure builds up in the sac, preventing the heart from working effectively, which can result in ascites and eventually the animal going into heart failure.

“This was a slightly unusual case as PPDH is congenital and Sheldon has had his since birth with no adverse effects until recently.”

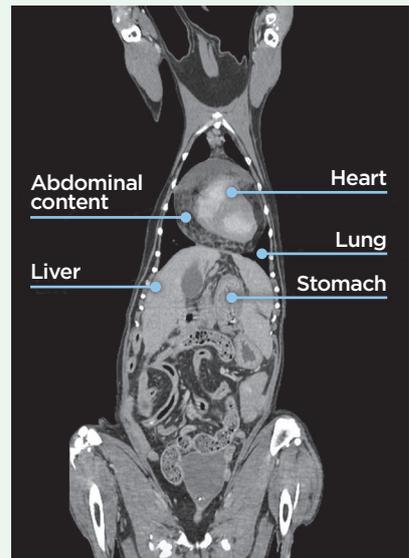
We drained this effusion on two occasions, but when it happened for a third time, we recommended surgery to remove the sac.

We therefore performed an intercostal thoracotomy and a subtotal pericardiectomy. Sheldon recovered quickly from this and has had no further recurrence

of fluid around the heart or chest. This was a slightly unusual case as PPDH is congenital in cats and dogs. Sheldon has had his since birth with no adverse effects until recently.

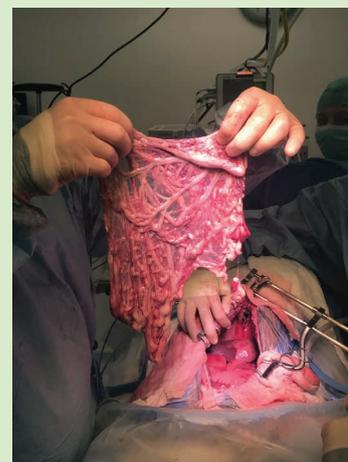
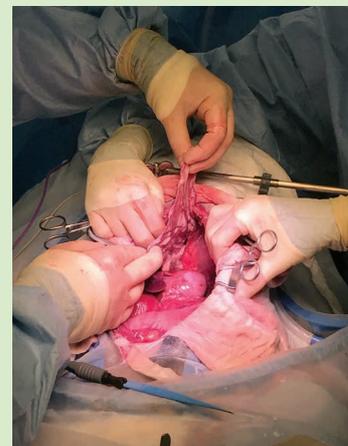


An emergency exploratory coeliotomy was performed, where we identified a ruptured gastroduodenal ulcer, which was biopsied and repaired. The necrotic omentum was resected, and the hernia closed.



Usually dogs recover well without requiring further treatment once the hernia is sealed but this was not the case with Sheldon.

We believe the fluid inflammation was secondary to on-going inflammation in the pericardium, as there was no evidence of infection or neoplasia on multiple samples.



## ONE-OF-A-KIND BRODIE IS A VETERINARY FIRST

We have a veterinary first to share with you this month! We recently treated Brodie, a humble one-year-old mongrel, who may now be used as a leading light in scientific case literature.

Brodie, a Beagle-Border Collie crossbreed, was significantly underweight, unresponsive, timid and quiet when he presented and we were initially unsure why.

However, further investigations, including consulting with genetics experts in the UK and USA, helped us establish that Brodie is the first crossbreed dog to suffer from a genetic mutation called Imerslund-Gräsbeck syndrome, caused by a vitamin B12 deficiency.

Internal Medicine Specialist, Andrea Holmes, said: "Brodie is one of a kind as he is the first reported crossbreed dog with this condition.

"Genetic mutations are often breed-specific so pure-bred dogs are more likely to develop them.

"For instance, Imerslund-Gräsbeck syndrome is reported in Beagles and Border Collies and occasionally other pure-breed dogs.

"However, Brodie was found to have both the Beagle and Border Collie genetic mutation, making him unique."

Andrea teamed up with head of Neurology, EBVS and RCVS Specialist Massimo Mariscoli, to solve the mystery ailment.

Andrea added: "Brodie underwent blood tests, analysis of his urine, spinal fluid and vitamin B12 levels plus a CT scan and a genetic test for vitamin B12 deficiency.

"Brodie's case was then discussed with an American Professor of Genetics and British Doctor of Genetics who both have a keen interest in this rare genetic condition.

"As a result, it's highly likely Brodie will now be used as a case report in veterinary scientific literature to increase the awareness of genetic diseases in crossbreed dogs."

While the diagnosis was perplexing and the testing exhaustive, the solution is perfectly simple – a daily B12 vitamin tablet.

Andrea said: "Brodie has made an excellent recovery and should now be able to live a normal, active life.

"He is livelier than he ever was and has gained weight to have an ideal body condition. It's a very satisfying outcome to a highly original case."



## “OUTSTANDING” PARAGON SCOOPS FOUR RCVS AWARDS

It's been a great start to 2020 as we've earned glowing praise from the RCVS after being rated as outstanding in four different award categories.

We have been recognised for our excellent work in Team and Professional Responsibility, Diagnostic Service, Inpatient Service – for which it received full marks – and Emergency and Critical Care Service.

The RCVS assessor was impressed by our first-class staff and facilities. The assessor's report said: "The premises are genuinely state-of-the-art, with all the space and equipment needed to provide a full multi-discipline referral service.

"The outstanding feature of this visit was the level of inpatient care, which is impressive with dedicated team leaders and thorough handovers for continuity of care, and the depth of knowledge of the clinical and nursing teams.

"Special mention must be made of

infection control and inpatient modules in which all the award points available were obtained."



In a special message to Paragon staff, the report added: "You have all produced a centre to be proud of, and the feeling of pride and commitment of the team, came across very clearly. I wish you every success as your reputation grows."

Rebecca Lunn, Operations Co-

ordinator, was delighted with the ringing endorsement of the RCVS which, she says, is a fitting reward for Paragon's continuing investment in first class facilities, the finest equipment and top-class staff.

She said: "Pets always come first at Paragon so to receive four "outstanding" awards from the RCVS is a great compliment and achievement.

"Naturally we are delighted. It's a real tribute to our entire team and our determination to deliver quality care, excellent service and a compassionate approach to ensure the best possible treatment for our animals.

"To achieve this, we have invested heavily, not only in the best, highly-experienced diplomates but also the most advanced specialist equipment within veterinary science.

"That level of commitment will continue on all fronts as we strive to be the very best we can be."

# HOW TO REFER

## CASE ADVICE

We welcome calls if you require pre-referral advice about a patient, even if no referral follows.  
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