Feature Article
Management of an extensive necrotic wound using various hydrocolloids and a mesh graft.

CVE are delighted to announce that there will be no increase in Membership Fees for the next financial year.
Chlamyphila causes pain and distress.

Antibiotics will eventually work but...

maybe it’s time to break the cycle.

“Cats with Chlamyphila infection can experience quite intense and uncomfortable ocular symptoms. With no obvious downsides, practitioners should seriously consider vaccinating against Chlamyphila routinely, particularly in younger cats.”

Prof T Gruffydd-Jones, BVMed PhD DipEVIM MRCVS, University of Bristol, 2013

A blade of grass causing respiratory distress and epistaxis in a cat

Gary D. Norsworthy, USA

External markers of internal disease: the ‘not-so-humte’ nail clip: A nail clip should be mandatory before an MRI or CT! – WINNER

Ane Saviers, Oak Flats Veterinary Clinic

Streptococcus as a one-dose for Giardia

Comments courtesy of: Richard Gowan & Mark Westman

Enamel hypoplasia in an 8-month-old dog: a case study

Natalie Burke, RSPCA NSW

Acute skin necrosis in a Kelpie

Marilyn Neales, Albert Animal Hospital

Fulminant ascites options – drugs and scalpels

Ane Saviers, Oak Flats Veterinary Clinic

Animal Pain

Fiona Cameron, Shepp Vets

Reply to C+T No. 5172 Elevations in ALT and gall bladder ultrasound changes in anaphylaxis – 2 case reports

Rick Atwell

C&T No. 5273 Chronic cystitis driving me crazy

Aine Seavers, Oak Flats Veterinary Clinic

Part 4.1 Bats

– WINNER OF BEST FILM CLIP

Mimi Dona, Currumbin Sanctuary Wildlife Hospital

Surgical treatment of a mammary tumour in a Red Kangaroo

Alan Warner, Holroyd Veterinary Clinic

Comment courtesy at: Derek Speelman

Large

Surprising findings in bovine obstetrics – Schistosoma Reflexus – WINNER

Heather Shortridge, New England Veterinary Centres

Systematic BVDV management for beef herds – WINNER

Enoch Bergman, Swans Veterinary Services

From the DE files

Uterine torsion in an aged, non-gravid cat – WINNER

Ruth Gore, Eastwood Vets

Transient lymphoma regression in a cat

Ruth Gore, Eastwood Vets

From the DE files

Small

Delayed presentation of Tiger Snake envenomed dogs

Steve Holloway, Advanced Vet Care

Here is a story with a moral for you

Martin Whitehead, UK

Comment courtesy at: Gary D. Norsworthy

Cutaneous asthenia: a case study

Anita Guo & Christie Budd

What’s YOUR diagnosis?

Answer to: Swelling on the flank of a cat

Marilyn Neales, Albert Animal Hospital

Perspective No. 96

How to best monitor diabetes in cats

Linda Fleeman, Animal Diabetes Australia

Perspective No. 97

Management of an extensive necrotic wound using various hydrocolloids and a mesh graft

Kim Fryer, Cannon & Ball Veterinary Surgeons & S Lamb, Holistet Australia

From the Director

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As I write this editorial, the hot topic in e-mails and the media have been the proposed changes by the Federal Government to the tax deductibility of self education expenses, with a proposed upper limit of $2000 per head per financial year. Like the AVA, the AMA and other professional bodies, the CVE considers this move to be short-sighted and one which will not only affect continuing education providers but also the universities and other tertiary educators. While the Government is targeting first class travel and luxury hotel accommodation as conference rents, why should the majority of people seeking professional development be treated with the same brush?

Attendance at many conferences, wet workshops and distance education courses cost well over the $2000 threshold and without doubt many CVE supporters will be hard hit. I urge you to voice your disapproval of this proposed tax change loudly and for as long as it takes to prevent its implementation. Lobby representatives for both major political parties as there is no indication that this will be revoked by the opposition if they form government after the September election.

While I am on this topic, many of you will have recently received a printed booklet from the CVE with our 2013/2014 conference and workshop calendar. We are very proud of this program and hope that having all educational opportunities in one accessible publication will make it easier to select and register for events across a broad range of topics, from short courses to our intensive DE courses. If you have not received a copy, simply download a copy from the Events main page on the CVE website www.cve.edu.au.

This edition of C&T has another great mix of articles from wildlife to cattle, cats and dogs as well as two Perspective articles. The third annual Dr Robert Dixon Animal Welfare Memorial Symposium was held on Monday, 25 March 2013 in the Webster Lecture Theatre at the University of Sydney. This year’s topic was ‘The economics of welfare in intensive farming’.

Professor Paul McGreevy from the Faculty of Veterinary Science opened the symposium, extending a warm welcome to all including Robert’s family: wife Roselyn, sons Justin and Jason and Robert’s father Arthur. Chair Dr Chris Degeling then introduced each member of the discussion panel—Ms Katherine Flawsman, Dr Ral Fevre, Mr Philip Serpe, Dr Bidla Jones, Mr John Cordina and Mr Grant Hilliard.

The Q&A then got underway to a packed lecture theatre with some thought-provoking and interesting views and responses from both the panel and audience.

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3 Jun - 30 Jun
TimeOnline: Rabbits & Rodents
15 Jul - 11 Aug
TimeOnline: Wildlife (Students)
22 Jul - 18 Aug
TimeOnline: Pet Fish
5 Aug - 1 Sep
TimeOnline: Respiratory Physiology
12 Aug - 8 Sept
TimeOnline: Otteris
26 Aug - 22 Sep
TimeOnline: Small Animal Behaviour
2 Sept - 29 Sep
TimeOnline: Marine Wildlife (Students)
28 Oct - 24 Nov
TimeOnline: Angiography (Compilations)
4 Nov - 1 Dec
TimeOnline: Avian

Listed dates are subject to change. Refer to www.cve.edu.au, for any updates.

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**The economics of welfare in intensive farming**

**2013 Dr Robert Dixon Animal Welfare Memorial Symposium**

*Dr Robert Dixon, an inspiration to so many,*

The third annual Dr Robert Dixon Animal Welfare Memorial Symposium was held on Monday, 25 March 2013 in the Webster Lecture Theatre at the University of Sydney. This year’s topic was ‘The economics of welfare in intensive farming’.

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The Q&A then got underway to a packed lecture theatre with some thought-provoking and interesting views and responses from both the panel and audience.

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2 Jun
Hot Topics in Feline Medicine---Canberra
14 Jun
eCPTPD: Practical Radiology for the General Practitioner---Sydney
24-28 Jul
Cardiorespiratory Conference---Melbourne
13-14 Jul
Approaches to Avian & Exotics---Sydney
19-21 Jul
Internal Flavours---Melbourne
27 Jul
Basic Echocardiography---Townsville
28 Jul
Advanced Echocardiography*---Townsville
3 or 4 Aug
Emergency Workshop---Sydney
17 - 18 Aug
Otteris---Brisbane
31 Aug - 1 Sept
Otteris---Sydney
23-26 Sept
Surgery Conference---Fremantle
5 or 6 Oct
Hip & Stiffe Workshop---Brisbane
13 Oct
Diabetes---Brisbane
27 Oct
Looking Down the Microscope---Perth, NZ
8 Nov
eCPTPD: Behaviour---Sydney

* Prior learning will be required to attend this workshop.

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All CVE courses are presented by leading experts in their field, so you can confidently choose the CVE to provide you with the quality professional development you seek to become a better practitioner and ensure the continuing success of your practice.

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Missed the event? You don’t need to miss out entirely – buy the event proceedings.

Speaker – Vanessa Barrs

Hot topics in feline medicine and practical tips for best-practice management of feline diseases encountered in everyday practice.

Vanessa Barrs presented new case-based information on hyperthyroidism in Australian cats to help vets optimise management of hyperthyroid patients with concurrent chronic kidney disease.

For further information on the proceedings visit www.cve.edu.au/node/25842

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**LONG-TERM CVE SUPPORTER**

Marshall Thornton comments on the March 2013 e-book

I am writing to commend your fantastic efforts in turning the online C&T into an ‘e-book’, actually an interactive PDF document. I have saved a PDF copy on the desktop, and it’s great to hover over an icon to see a larger photo, or click on an interactive video link to watch Mimi handling the native animals. The video idea will be well worth using. Videos of procedures, of ultrasound real time images, unusual neurological cases – endless information possible! We all have smart phones so we can take the videos.

Going back and forth over the C&T using the contents page is great. So also is the tick round table discussion. I can download the articles the discussions are referring to by clicking a link in the discussion, without having to dig out the filled away and coffee stained hard copy to find the articles. But we still love the hard copies!

I can commend this interactive C&T to other colleagues; once you get the hang of using it it’s very easy, and the access to videos is a great feature. Download it on Internet Explorer!
Thank you to all contributors

... and more C&T articles and Perspectives needed
Thanks to every author who contributed articles or comments to the Control & Therapy Series (C&T). Without your generosity the Series would cease to exist. If you have treated a Large Animal, Reptile or any Wildlife lately, please write up the case and send it in. We aim to keep the Series broad and interesting.

Winners

Major Prize
Entitling the recipient to one year’s free membership of the CVE
• Kym Fryer: Management of an extensive necrotic wound using various hydrocollodids and a mesh graft

CVE Publication Prize Winners
• Heather Shortridge: Surprising findings in bovine obstetrics – Schistosoma Reflexus
• Enoch Bergman: Systematic BV/DV management for beef herds
• Ruth Gore: Urinary torsion in an aged, non-gravid cat
• Aine Seavers: External markers of internal disease; the ‘not-so-humble’ nail clip: A nail clip should be mandatory before an MRI or CT
• Natalie Burke: Enamel hypoplasia in an 8-month-old dog: a case study.

Winner of Best Film Clip
Mimi Dona for the clip demonstrating restraint of Bats.

Winner of the CVE$500 draw!
Congratulations to Sarah Patullo, winner of the CVE$500 draw. We hope all readers/members access the complimentary e-book version of our June 2013 issue – see Marshall Thornton’s praise for the e-book on page 3.

All CVE Members who receive the print copy of the C&T Series are entitled to the e-book version
The e-book is the perfect complement to your print version. With a roll of your mouse you can bring up previously published C&Ts to save you having to hunt around for back issues. For example, you may be reading the replies to previous C&Ts and wish to refer back to the original article. Simple – just ‘rollover’ to bring up the article on your screen or download and print it out. With a click of your mouse you can view film clips, or roll-over to enlarge and view X-rays or images.

Look for these symbols
To be emailed the link to the e-book you must provide CVE with your current email address
Contact cve.membership@sydney.edu.au or call Jacqui Kennedy and receive your Login and Password details. Then visit www.cve.edu.au/candtebook which allows you access to this current issue in e-book format and the 4 prior issues (June, Sept & Dec 2012 & Mar 2013)

Contact
For all enquiries regarding the Control & Therapy Series, please contact The Editor, Elizabeth Churchward at cve.publications@sydney.edu.au or call (02) 9351 7979.

Wildlife

WINNER OF BEST FILM CLIP
Compiled at the Currumbin Sanctuary Wildlife Hospital by Mimi Dona © 2010

Part 4: Wildlife Flashcard Series
Mammals
C&T No. 5302

This series is the result of collaboration between Mimi Dona & Dr Michael Pyne of Currumbin Wildlife Sanctuary Veterinary Hospital. Non CVE members can access these flashcards and videos at www.cve.edu.au.

Mimi Dona
Senior Veterinary Nurse – Currumbin Wildlife Sanctuary Veterinary Hospital (CWS) & Lecturer on Animal Studies and Sustainability at the Metropolitan South Institute of TAFE.

Mammals

BATS – MEGA BATS & MICRO BATS
Be aware:-
• Only persons vaccinated against Australian Bat Lyssavirus and wearing the correct personal protective equipment (PPE) should handle any bat species, or be present in the room prior to them being anaesthetised. Notify the appropriate health authority immediately if bitten or scratched.
• They can bite and also scratch using their thumb claws and feet. Their long extendable wings must be restrained as they have a thumb at the end of their Carpals for gripping.
• Micro Bats – Insectivorous bats. Can be mistaken for baby mega bats.
• Mega Bats – flying foxes (or fruit bats).
• Predominantly nocturnal although social during the day.
• Transport bats wrapped in a towel in a well-supported transport carrier – do not allow them to hang in a cage during transportation.
• Flying foxes can get tick paralysis and require treatment.
• Mimic their behaviour by hanging them upside down.

Contact
For all enquiries regarding the Control & Therapy Series, please contact The Editor, Elizabeth Churchward at cve.publications@sydney.edu.au or call (02) 9351 7979.
• Mega bats are handled by wrapping a towel around them, and gripped around the back of the head/skull to prevent being bitten.

• Provide the orphaned Mega bat with a rolled up face cloth to cling to, folding the wings around the wrapped cloth; once holding on wrap (swaddle) another small fine towel around for support.

• Micro bats can be gently handled in the palm of your hand; secure the head with the thumb and forefinger, scrubbing the back of the neck or place the thumb up under the chin of the bat.

Housing the sick or injured bat

• Mega bats - Preferred enclosure temperature = 28˚ Celsius for adults and 30˚ Celsius for orphans.

• Adult Mega bats can be placed in a large open top wire carry cage placed on its side lined with soft towels on the bottom and a towel to cover and make it dark. They must be able to access the wire on the roof of the cage so they can hang upside down; they will get very stressed if they cannot mimic this natural behaviour.

• Infants should be wrapped (which will contain them) and then placed on their back in the base of a wire cage should they get out; towels can be used to soften the base and create a gradient so they have their head down. Keep the cage covered and dark. Teats without holes can be provided as dummies. Heat must be given - full term 28˚ - 32˚ Celsius and premature 32˚ Celsius. Ideally they should be housed in a Vetran® or Humidicrib and monitored with an indoor/outdoor thermometer.

• Micro bats - Preferred enclosure temperature = 30˚ Celsius for adults and 35˚ Celsius for orphans.

• Adults can be held in a plastic aquarium or secure enclosure that they can’t escape from, and must be provided with a branch to hang onto and small towel to climb and hide in.

• Place orphans in a cotton pouch with teat and provide heat - 35˚ Celsius. Ideally they should be housed in a Vetran® or Humidicrib and monitored with an indoor/outdoor thermometer or alternatively place in a plastic aquarium with a sealed/ventilated lid.

Emergency diet

• Mega bats can be offered a good quality fruit juice (e.g. apple, banana, grapes, nectarine or soft fruit).

• Micro bats can be given insects and encouraged with hand feeding if not self-feeding.

• Orphans can be given water and Glucodin initially for the first 2 feeds, then a suitable milk replacer (Divetelact®). This can be given either via a 1mL syringe with catheter tip or for larger orphans use a bottle and appropriate sized teat.

Assessment under anaesthetic

Gaseous

All bats should preferably be anaesthetised prior to handling for assessment. This can be achieved with the assistance of a large towel, wedging/ pinning the bat in the cage so you can administer the anaesthetic via the mask.

Use an anaesthetic mask at 5% induction, can take 2 - 3 minutes. Maintain using a mask on Isoflurane® at 1.5 – 2% with an oxygen flow rate of 1 L/min.

Anaesthetic Agents

Alfaxan® CD RTU 3 mg/kg – (I/M)
Propofol® 8 – 10 mg/kg – (I/V)
Zoletil® 200 mg/mL, 0.54 mL of Domitor® 1mg/mL and 0.45 mL of Acepromazine 2 mg/mL

Due to the difficulty with intubation of Micro bats, gaseous anaesthesia is recommended.

Intubation

Cuffed endotracheal tube or catheter tip, some species are too small for intubation. Insert the endotracheal tube with the aid of an anaesthetic spray and lie in with shoelaces.

Surgical treatment of a mammary tumour in a Red Kangaroo

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On Wednesday 25/05/2011 I examined an approximately 15-year-old female Red Kangaroo (Macropus rufus) part of a Council native fauna exhibit. Staff had noticed dried blood on the animal’s tail and found fresh blood on the ground near a fence. My initial impression was the animal had run into the fence resulting in a nose bleed as there was dried blood on her muzzle. The mass was supported by black fascial pellets that would result from the swelling of significant blood from a nose injury. This subsequently proved to be a misdiagnosis.

The animal was a small red kangaroo in good condition (score of 4-5). She behaved normally and no bleeding was observed at a distant examination. The staff were advised to keep her in a small (5 m x 8 m) pen for observation.

Five hours later the staff advised me there was fresh blood around the pouch. I returned fully equipped to anaesthetise and surgically repair any laceration. Although not a pet the animal was approachable and was caught by tailing her and wrapping her in a blanket. On close examination of the pouch I found the blood came from an ulcerated tumour approximately the size of a tennis ball (8 cm diameter). There was a smaller (4 x 2 cm diameter) mass nearby. The blood on her muzzle and the black faecal pellets could have been from cleaning her pouch and ingesting blood. Staff were advised it would be a major procedure to remove the tumours with low hope of success in a captive yard. I estimated the animal to be approximately 30 Kg in weight and administered 3 mL of Betamax LAT 150 mg/mL. We scheduled her for surgery the next week at our clinic. This would involve an intravenous sedative and transporting her approximately 1 km to our clinic.

The next week Sydney had near record rainfall so the operation was postponed. On 06/06/11 the weather was fine. Council staff and my colleague Dr James Phelan helped catch the animal and anaesthetise her.

The anaesthetic was a combination of drugs formulated by Dr Sally Coglan and used to induce anaesthesia for surgical intervention in many macropods. In this case I injected 0.38 mL of Zoletil® 200 mg/mL, 0.54 mL of Domitor® 1mg/mL and 0.45 mL of Acepromazine 2 mg/mL into the anterior thigh muscle.

The animal was suitably sedated for transportation within 12 minutes, with no excitement or running. It was obvious from the foul odour the mass had become more necrotic and extensive since the initial examination. On close examination it was apparent that the only alternative to surgery was euthanasia. The animal was a favourite with the staff and the public and we decided to attempt the surgery.

At the clinic she was induced with 5% Isoflurane via a face mask and maintained on 2% Isoflurane in 100% oxygen for the first 1¾ minutes.

Recovery

Use a Blair Hugger® or heat mat and room temperature to maintain the patient’s core body temperature throughout the procedure, using a cloacal thermometer to monitor. Once off oxygen, return the bat to the enclosure wrapped in a towel and place in a vertical position (upside down). Bats will usually get out of the wrapped towel and climb to a hanging position within 1 - 2 hours. With orphans, Vetran® or Humidicrib are ideal during post-operative recovery.

Fluid Therapy

It is important to remember to warm the fluids being administered. Using 0.9% sodium chloride, close the patient at 5% of its bodyweight. Fluid therapy can be administered IP or by using standard IV infusion rates. Syringe pumps are ideal to use in small mammals if available.

Preferred routes for drug administration

• Subcutaneous – administered in loose skin at lateral neck/shoulders.

• Oral – given via a syringe, with smaller species use a cannula attached to a 1mL syringe.

• Intramuscular – pectoral muscle over breastbone is preferred, alternatively quadriceps, triceps muscles.

• Intravenous – cranial edge of wing membrane.

Euthanasia methods

Injection of Sodium Pentobarbitone® can be administered either by intravenous, intracardiac or intraperitoneal routes.

• If administered by intracardiac or intraperitoneal, the bat must be anaesthetised first.
The next morning 15/06/11 we checked and cleaned the pouch and found the incision was healing well. Unfortunately on 27/06/11 we were informed by the staff that the animal had been found dead in her pen. The Council staff brought the animal into our clinic and we did a necropsy to determine the cause of death.

Discussion.

The decision to operate on this animal was influenced by several factors. In a domestic animal we would have biopsied the mass and decided to resect it based on the findings. However, although this kangaroo was a captive animal she was not tame. We decided that the capture and anaesthesia of the animal, possibly twice if the biopsy results were favourable, would be more traumatic to the animal than one anaesthetic during which both procedures could be done. Cold and wet weather was also of concern in giving multiple anaesthesias.

Another consideration was the paucity of published information relating to mammary tumours in large macropods. One of the few published articles on the topic reported mammary adenocarcinomas that had metastasised to the lungs in 2 aged M. rufus. We reasoned that from the limited data we could not rule out the possibility that the neoplasia was benign.

The pathologist's comments on the serum biochemistry that the animal 'had an inflammatory leukogram but only mild biochemical changes and mild hypoalbuminaemia' were encouraging as we were concerned that the tumour may have spread to the liver.

Hb 115 g/L
WBC 14.5 x10^9/L
RCC 3.6 x10^12 /L
Hct 11.0 x10^9/L
MOV 101 L
MCH 34 pg
MCHC 317 g/L
NRBC 8 /100 WBCs
Plat 395 x10^-9 /L

Red cells:
Anisocytosis + Polychromasia +++

White cells:
Occasional reactive lymphocytes

Platelets:
Normal

Brain:

NOTE: WBC parameters corrected for presence of NRBC.

Hormone levels:

Fasting status: Fasting
Sodium 142 mmol/L
Potassium 7.3 mmol/L
Chloride 103 mmol/L
Bicarbonate 26 mmol/L

We did not receive the histopathology results until over a week after the operation. Unfortunately the report stated 'mammary tubular carcinoma with metastasis to local lymph node'. At necropsy the immediate cause of death was acute haemorrhage into the lungs (Image 5).

We are interested to know if your animal ever recovered from the tumour. wildlife @ sydney.edu.au

References

1. Dr. Sally Coglan. SBCO Pty Ltd. Personal Communication.
3. Antesedan 5 mg/mL. Pfizer Aust. Pty Ltd.
4. Acetyl promazine 2 mg/mL. Acepromazine maleate. Delvet Pty. Ltd.
6. Domitor 1 mg/mL. Medetomidine hydrochloride. Pfizer Australia Pty. Ltd.
7. MCH 34 pg

Drugs and materials used:--

1. Betamox LA 150 mg/mL. Notornis Labs. Aust. P/L
2. Zoleid 200 mg/mL. Zoetis 100 Virtus (Australia) Pty Ltd.
3. Domitor 1 mg/mL. Medetomidine hydrochloride. Pfizer Australia Pty. Ltd.
4. Antesedan 5 mg/mL. Pfizer Aust. Pty Ltd.
5. MCH 34 pg
6. Equipa TAT 1500 mL. Tetanus Antitoxin. Pfizer Aust. P/L

Wildlife

The bacteria were cultured in order to detect if the animal had tuberculosis that could be of concern to the staff involved in her care. The bacteria from the abscesses were identified as Bacteroides sp.

Invited Comment courtesy of:

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This article could be very useful to other practitioners faced with similar cases. The paucity of articles on the surgical treatment of tumours in kangaroos and marsupials in general is consistent with that of most wildlife species. Published articles tend to be based on animals in international zoos where the animals are expensive and difficult to replace so more effort is directed towards their disease investigations and treatment. Red kangaroos are easy to obtain in Australia and generally aged red kangaroos with significant tumours would be euthanised without a post-mortem or histopathological investigation. However, as owner attitudes towards captive non-domesticated animals change in parallel with those of pet owners veterinary practitioners are likely to deal with similar cases. The article provides valuable information about how the case was managed but I agree with the editor’s comments about the need for thoracic radiographs prior to major surgery for tumour removal. As the animal was aged with significant widespread disease the anaesthetic regime seems to be safe and reliable.
One Saturday afternoon I was called to attend ‘Betty’, a 7-year-old pet cow, whose owner reported was having trouble with a ‘breech’ calving. Vaginal palpation revealed a confusing picture; I could not feel a breech calf, but something very odd was going on. I palpated around for a bit, and got an odd pulsating structure in my hand, which in a ‘light bulb moment’ I realised was the calf’s beating heart! I explained the situation to the owners and the potential difficulty of a Caesar. With obvious affection for Betty, they asked me to give it a go.

Initially this proceeded as a normal caesarean, until it was time to get the poor calf out. It was hard to get a foot out.

Figure 3a and next page 3B. Pulling out the deformed calf.
Then once we had a foot, it was really hard to pull the calf. The calf was struggling, and I euthanased it via direct cardiac trauma, which sounds awful, but was very effective and more humane than continuing to tug on this deformed calf with it alive. Eventually with a team of pullers we got the calf out.

I was quite worried at this point that I might not be able to close the uterus, which always seems like one of the biggest risks when a calf is difficult to extract by caesarean. I was particularly worried in this case as we had pulled the calf out with one back foot and one front foot, as it was so hard to know which bit was which.

As you can see, the poor calf was a real mess. Fortunately the uterus was not badly torn and I was able to close it (Figures 5 & 6).

The rest of the caesarean proceeded more as per normal and I was thrilled to hear several weeks post operatively that Betty was going well, and rearing 2 foster calves.
As an aside, for anyone who does any cattle work, I cannot sing the praises of my pictured waterproof overalls highly enough. I purchased them on a dairy trip, and it seems lots of beef vets don’t have them, but they are fabulous.

Another tip from Bob Franklin, one of our senior vets, is to instil salty water (we usually use about 10L) in the abdomen of the cow prior to closing. This can both be used to flush contamination from the abdomen when there is a rotten calf, but also presumably provides the cow with some fluid support (and if anyone has a tip for making it easier to give cattle hypertonic saline in the jugular, I would love to hear it, as it is something I struggle with.)

As with any form of management, experience has taught that no farm which harbours a PI animal is safe. The more effective the exposure of young stock to PI animals prior to their first paring, the higher the proportion of immune animals during pregnancy, reducing the proportion of PI animals. Over time, fewer PI calves means reduced exposure of new young stock, potentially evading BVDV in groups of seronegative animals. Once these animals reach breeding age they will spend the majority of the rest of their lives either pregnant or trying to become pregnant. If they go to the bull without any form of immunity to BVDV, should they meet a PI later in life, a wreck could occur. Wrecks resulting in large numbers of PI’s results in high overall immunity, and the cycle repeats itself. Without knowing the immune status of their animals and without understanding the epidemiology of the disease, it is no wonder that many producers that find themselves experiencing BVDV up close and personal often believe it has been brought in by their neighbors, when the reality is usually that they have been endemic infected for years.

The propagation of BVDV is all about timing. Animals without prior immunity, exposed to BVDV during their pregnancy from one to four months produce more PI animals. Managing BVDV effectively is all about timing as well. By providing seronegative animals immunity and removing PI animals before joining, BVDV can be successfully managed.

Antibody screening is the most sensitive way to screen for the presence of PI animals without directly ear notch testing all of the animals on the property. Quite simply, if an unvaccinated animal has immunity to BVDV then it is likely from direct exposure to a PI. If a PI has existed for a reasonable amount of time within a management group, most or all of the animals will have seroconverted to the virus.

Many times we as veterinarians may begin our BVDV investigation as part of an abortion screen. AGID testing requires a reasonable amount of time, more than the TEGO device harvest. The AGID is a very useful tool to prove or disprove recent exposure to BVDV, excellent for abortion investigations. The antibody ELISA on the other hand is a less expensive tool to measure the lack of, or presence of, BVDV antibodies without estimating the recentness of infection.

Often I am called upon to work up a property’s BVDV status from scratch. In other instances, I am following up an investigation that had either previously detected or implicated BVDV. The TEGO devices allow me to quickly set up a risk profile for the entire herd. As veterinarians, we can help our producers to invest their resources most cost effectively by measuring the immune status of individual mobs on each individual property.

1. Mobs with a high level of immunity will not benefit from vaccination.
2. Stable mobs with low levels of immunity do not contain PI animals.
3. I ask my producers to collect blood using the TEGO devices from 5% or a minimum of 6 animals from each stable management group on the property. When appropriate, mobs without immunity are advised to enrol in a Postpartum vaccination program. Mature mobs with high levels of immunity may contain a PI, or the immunity could be from historic exposure. Rather than ear notch testing the adult animals from these highly immune mobs, I monitor their calves for the presence of PI animals. At calf marking, any woody calves are ear notch tested and visually marked. If the calf is a PI, their mother may be as well. The calves are observed to ascertain the identity of their dam and she is eventually also ear notch tested. A new and handy tool for testing calves crush side is the IDEXX BVDV SNAP test. At the same cost, veterinarians can source the new

Figure 1. The cow’s ear shows a TEGO in action. Photo courtesy of Susan Pike Production.

Figure 2. The cow and calf represent: ‘A PI cow discovered by identifying its cal as a PI first.’

SNAP tests either from Swans Veterinary Services or IDEXX directly. Any PI’s found at the end of each draft could be held back to identify their dam, allowing her to be tested immediately. Any adult PI animals would then be sold direct to slaughter.

After profiling the risk level of each of the mature mobs, my systematic control program focuses on annually ensuring that all new groups of replacement heifers is both immune and PI free prior to mating. Screening a proportion of the unvaccinated replacement heifer mob well in advance of mating allows us to do just that. At the time of testing, the heifer replacement mob must be immune, the expense of vaccination can be forgone, and the heifers individually ear notch tested. Any PI animals which may exist within the mob can then be found and sold to slaughter before she begins to waste away.

Occasionally, especially in more extensive situations, or in large groups of replacement females, the seroregeneration of the group may still be maturing. If only a proportion of the animals are serorepositive, there are three general strategies:

1. Incomplete ongoing exposure (PI still present)
2. Historic PI exposure (PI present prior to heifer selection process)
3. The seronegative animals are in fact PI animals themselves

Scenario 3 can be quickly ruled in or out by performing an antigen capture ELISA on the same blood sample that was used to measure for antibody levels. If scenario 3 has been removed, scenarios 1 and 2 can be discerned by performing follow up serology on the replacement heifer group one month after the first screening. Producers should be directed to collect samples from the previously seronegative animals and an additional 5% randomly selected heifers. If all or a proportion of the previously seronegative animals have since seroconverted, there is
Uterine torsion in an aged, non-gravid cat

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Introduction

Uterine torsion is an uncommon condition in the intact female cat, most commonly associated with pregnancy. The following case study reports on a case of uterine torsion in a non-gravid queen which presented with anorexia and abdominal distension, and had a regenerative anaemia with hyponatraemia and hypochloraemia on laboratory analysis.

Case Report

An 11-year-old entire female Domestic Shorthair cat weighing 3.9kg was presented after hours for anorexia of 1 week’s duration and abdominal distension which had only been noticed the previous day but had become more pronounced. The cat was still drinking normal amounts and there was no vomiting or diarrhoea seen. A change in behaviour had been noticed over the preceding 3 weeks with the cat following her owner around more and not wanting to be left alone. The cat lived indoors and had no apparent access to outside.

The cat was lethargic and was noticed to be watching her environment in a more acute manner than usual. The oral mucous membranes were pale, heart rate 200 beats per minute with a grade 1 murmur, respiratory rate 50 breaths per minute with a grade 1 murmur, respiratory rate 50 breaths per minute. The cat was breathing rapidly and was in respiratory distress. The cat’s abdomen was distended (Fig 1) with a large non-painful fluid-filled tubular structure visible through the skin. On auscultation, the heart and lungs were normal. The cat was placed in a temperature-controlled environment and intravenous fluid therapy commenced. An endotracheal tube was placed and the anaesthetic maintained with inhalational isoflurane and oxygen via a non-rebreathing circuit. The cat was placed on intravenous crystalloid fluids (0.9% sodium chloride solution) at a rate of 3mL/kg/hour and administered 43.75mg amoxicillin/clavulanic acid (Clavulox™ injectable) intramuscularly pre-operatively. Premedication with 0.6mg methadone/0.06mg atropine was administered subcutaneously, followed by anaesthetic induction with 10mg alfaxon (Alfaxan™) intravenously. An endotracheal tube was placed and the anaesthetic maintained with inhalational isoflurane and oxygen via a non-rebreathing circuit. The intravenous fluid rate was increased for the duration of the anaesthetic and surgery to 10mL/kg/hour.

Preoperative blood work revealed a moderate normocytic, normochromic anaemia with a packed cell volume (PCV) of 16.5% and haemoglobin (Hb) of 4.8 g/dL. The total white blood cell (WBC) count was 10.33 × 10^9/L with a neutrophilia of 7.84 × 10^9/L. The platelet count was 209 × 10^9/L. The total protein (TP) was 59 g/L with an albumin (Alb) of 29 g/L. The creatinine (Cr) was 1.95 mmol/L, and the electrolytes revealed a hyperchloremic acidosis. The sodium (Na) concentration was 112 mEq/L, and the potassium (K) concentration was 3.3 mEq/L. The chloride (Cl) concentration was 107 mmol/L (Fig 2).

A presumptive diagnosis of uterine torsion was made, and an exploratory laparotomy was performed. On examination, it was confirmed that a fluid filled hollow organ consistent with the uterus, and no evidence of fetal development (Fig 3). An exploratory laparotomy was scheduled following initial stabilization.

Upon examination and surgical exploration, a large non-painful fluid-filled tubular structure was identified, consistent with the uterus. The uterus was found to be dislocated from the body, and the ovarian follicles were present. The fetal membranes were absent, and the uterus was tightly twisted. The uterus was gently untwisted, and the uterine horns were released. The uterus was then gently released, and the non-painful fluid-filled tubular structure was removed. The uterus was then repositioned, and the abdominal cavity was closed. The cat was placed on intravenous fluids at a rate of 10mL/kg/hour and administered 43.75mg amoxicillin/clavulanic acid (Clavulox™ injectable) intramuscularly at 4-hour intervals for 5 days. The cat was discharged from the hospital after 24 hours, and the owner was advised to follow up with a veterinarian for further management.

Figure 1. Photograph of the cat showing abdominal distension

Figure 2. Haematology and serum biochemistry results.
The cat was placed in dorsal recumbency and a ventral midline laparotomy was performed. Upon entering the abdomen, a distended uterus was visible with a 1350° torsion of the left uterine horn along its longitudinal axis (Fig 4, 5). This section of the uterus was grossly congested and engorged with fluid and was still receiving some arterial blood flow into the area despite occlusion of venous drainage. The right uterine horn was also distended with fluid but to a lesser extent and still had a normal pink colouration. Ovariohysterectomy was performed with double ligation of all pedicles with 3/0 polydioxanone suture (Monodex™) – the torsion was not corrected prior to removal of the uterus. The abdomen was lavaged with approximately 500mL of warmed 0.9% sodium chloride solution and closed routinely. Analgesia (1mg meloxicam injection subcutaneously) and Vitamin B complex injection (0.5mL intramuscularly) were administered and maintenance fluids (2mL/kg/hour 0.9% sodium chloride solution) continued for 24 hours post-operatively.

The excised uterus and ovaries weighed a total of 820g. The left uterine horn was filled with thick bloody fluid. The right uterine horn contained light brown, slightly turbid fluid which seemed to be comprised of degenerate material and low numbers of normal appearing neutrophils – no obvious bacteria were visible on in-clinic microscopic examination but the presence of pyometra could not be excluded. Unfortunately, further cytological evaluation by a veterinary pathologist to characterise the fluid further and bacterial culture were declined by the cat’s owner.

The cat made a rapid recovery from anaesthesia and started to eat 6 hours after surgery. Continued improvement occurred over the subsequent 24 hours and the cat was discharged. Antibiotic coverage with long-acting cefovecin (26mg subcutaneously; Convenia™) injection was provided as the cat’s owner was quite elderly and unable to administer any oral medication.

Discussion

Uterine torsion is an uncommon condition in the queen and may involve one or both uterine horns twisting along the long axis or rotation of the entire uterine body7. Although the exact aetiology is unknown, it is thought to occur when there is an increase in the size or weight of the uterus, alterations in uterine muscle tone, foetal movement, or with lacky or weakness of the suspensory ligaments1,3,9. Unlike dogs where torsion may be associated with pregnancy, pyometra or with varying stages of the oestrus cycle11, torsion in cats is most commonly seen with a gravid uterus or in the periparturient period and until recently all recorded cases in the literature were associated with pregnancy2,3,6,10,11. This case was unusual in that the cat was not pregnant and had never produced a litter. To the author’s knowledge there have been only 2 other reported cases of uterine torsion in a non-gravid uterus3,9. In both cases there was fluid accumulation in the unaffected uterine horn unrelated to the torsion – in one case mucometra and the other pyometra.

Pyometra is much less common in the queen than the bitch. This is thought to be due to the lower exposure of the uterus to progesterone12. In the bitch there is spontaneous ovulation and the subsequent sustained elevation in progesterone levels, even without pregnancy, predisposes to cystic endometrial hyperplasia (CEH) and pyometra. As the queen is an induced ovulator, if mating does not occur there is no ovulation and hence no rise in progesterone. Even if mating and ovulation occurs, the subsequent rise in progesterone occurs for a much shorter period of time (45 days vs more than 60 days in the bitch). Spontaneous ovulation has been known to occur in queens in response to various pheromonal stimuli which could account for CEH and pyometra occurring in queens which have had no direct contact with males13. Fluid accumulation due to CEH/pyometra within the uterus of the cat would potentially increase the chances of torsion occurring but as there is a much lower incidence of pyometra in the cat this may account for the lower incidence of uterine torsion seen secondary to pyometra. Mucometra results from a build up of non-inflammatory fluid by blockage of the vulva, vagina, cervix or uterus. This may be a result of inflammation and scarring, tumour or congenital abnormality. The accumulated volume of fluid can be quite large (up to 500mL) in some cases and this would also increase the potential for uterine torsion.

Clinical signs associated with uterine torsion range from clinically normal to a collapsed state due to shock14. Commonly there is anorexia, vomiting, pale mucous membranes, dyspnoea, abdominal pain and distension, and vaginal discharge. The affected cats have ranged in age from 1 to 10 years and the stage of pregnancy from 4 weeks gestation to the peri-parturient period1,2,3,6,9. The clinical course in the pregnant queen tends to be relatively short from 2 hours to 3 days1, though there are exceptions to this15. The case with pyometra and subsequent uterine torsion also had a short clinical course (2 days)16 whereas the case with mucometra had a longer clinical course (1 week) and less cardiovascular compromise15. This may be as a result of the presence of a more severe metabolic derangement (pregnancy, dead foetuses, infection) in association with the torsion causing a more rapid progression of clinical signs16, but there are so few cases with which to compare there may be other factors involved including degree of torsion or how rapidly the rotation occurs. In the cases reported, the degree of rotation has varied from 180° to 900°1,2,3,6. In this case there was a 1350° rotation which is greater than what has previously been reported, but despite this the cat had shown only mild clinical signs for a week and was still relatively stable and bright at the time of presentation. Although the presence of infection could not be confirmed or ruled out in this case – it present it was most likely only low grade based on the clinical presentation and the appearance of the fluid obtained from the unaffected uterine horn.

The presence of uterine torsion may be suspected based on the results of physical examination, abdominal radiographs and abdominal ultrasound but final diagnosis is often not made until the time of exploratory surgery1,2,3,6. Ovariohysterectomy without correction of the torsion is the recommended treatment. De-rotation of the uterus can release endotoxins and inflammatory mediators into the circulation which can have serious systemic consequences and negatively affect the outcome of the surgery17.

Most cases of uterine torsion can be treated successfully if there is prompt surgical intervention and appropriate pre- and post-operative supportive treatment1,2,3,6.

The presence of a moderate normochromic, normocytic regenerative anaemia most likely was the result of gradual sequestration of blood with the lumen of the uterus following occlusion of the venous outflow1,2,3,4 – the “third spacing effect” whereby there is a fluid shift to an area of the body where fluid doesn’t normally accumulate in large amounts or becomes physiologically non-functional – i.e. outside of the intravascular and extravascular spaces. The loss of blood to the “third space” (in this case the uterus) creates the clinical appearance of a blood-loss anaemia (usually associated with haemorrhage or haemorrhages) without the cause being immediately identifiable. As the normal clinical findings associated with haemorrhage external wounds, haematuria, melena, haematochezia, haematemesis, epistaxis, haemartomas, hypoprotein remia and haemolytic (et was, haemoglobinuria, haemoglobininaemia, autoagglutination) are not –

Figure 3. Ultrasound image showing fluid distension of the uterus

Figure 4. Intraoperative photograph showing torsion, distension and congestion of left uterine horn and fluid distension of right uterine horn

Figure 4. Intraoperative photograph showing torsion, distension and congestion of left uterine horn and fluid distension of right uterine horn
seen – the initial identification and localisation of the condition can be difficult. The presence of an early regenerative response suggests that the sequestration had been present for longer than 3 to 5 days allowing time for a bone marrow response to occur. The lack of signs of shock at the time of presentation was also consistent with a more chronic disease course with a gradual reduction in the haematocrit rather than acute blood ‘loss’ from the circulation. The elevated heart rate, respiratory rate, and the grade 1 murmur were considered to be secondary to the anaemia. In the absence of major renal and gastrointestinal abnormalities, the hypoaesthesia and hypochyloasma were most likely occurring secondary to ‘third space’ loss and there was a moderate stress hyperglycaemia.

Conclusion
Blood loss into body cavities and the lumen of hollow organs – the ‘third space’ – should always be part of the differential diagnoses when the cause of the blood loss is not readily apparent and may be more insidious in nature. Uterine torsion – although very uncommon, especially in the non-pregnant queen – should be considered as a differential diagnosis in any intact female cat especially across the bridge of the nose, bilateral proptosis, and loud stertorous respiration (Fig. 3). The mass on the left side of the throat had increased in size. Euthanasia was elected at this time.

Case Report
A desexed male Domestic Short-haired cat, aged approximately 5 years and weighing 8 kg was presented for a lump which had only just been noticed by its owners. The cat had otherwise been well with no changes seen in appetite, elimination, activity levels or demeanour. On examination there was a firm, non-painful, fixed mass approximately 3cm in diameter in the right cranioventral neck region. Other than excessive weight, no other abnormalities were found during the clinical exam. Fine needle aspiration of the mass was unremarkable (only blood obtained) and surgical biopsy was recommended. Pre-anæsthetic blood tests were recommended but declined by the owner. A punch biopsy of the mass was taken under general anaesthesia and sent for Histopathology (Figs 1A & 1B). Removal of the mass was not attempted at the time due to the close proximity of the major blood vessels of the neck with the mass.

Introduction
Inflammation has often been implicated in the development of neoplasia in cats – most notably with inflammatory bowel disease/intestinal lymphoma and vaccine-associated fibrosarcoma1. Inflammation and stimulation of the immune system may also play a role in neoplasia regression and this may be utilised in cancer treatment protocols (Immunotherapy). The following report documents a case of apparent lymphoma regression following surgical biopsy.

Transient lymphoma regression in a cat

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References


Figure 5. Intraoperative photograph of the torsion

Figure 3. Marked facial swelling.

Figure 1A & 1B. Histopathology Results
This is a lymph node replaced by an extensively necrotic tumour composed of pleomorphic frequently huge histiocytic cells with frequent inclusion-like macronuclei, eosinophilic or clear cytoplasm, and a low mitotic index. They are accompanied by medium-sized and small lymphocytes. The changes are consistent with an anaplastic lymphoma. The disease may be a manifestation of T-cell/histiocyte-rich B-cell lymphoma (Hodgkin-like lymphoma). Immunohistochemistry is recommended to determine the T-cell and B-cell makeup of the neoplastic cells. This would allow a more specific diagnosis. – IDEXX Laboratories

The results showed an anaplastic lymphoma with a low mitotic index. It was recommended that the tumour be further staged by medium-sized and small lymphocytes. The changes are consistent with an anaplastic lymphoma. The disease may be a manifestation of T-cell/histiocyte-rich B-cell lymphoma (Hodgkin-like lymphoma). Immunohistochemistry is recommended to determine the T-cell and B-cell makeup of the neoplastic cells. This would allow a more specific diagnosis. – IDEXX Laboratories

Potential treatment options included chemotherapy, surgical resection at a referral centre, radiotherapy or a combination of these e.g. chemotherapy or radiotherapy to shrink the mass followed by surgical resection if necessary. Unfortunately, all further diagnostic procedures and treatment options for the mass, including palliative treatment with prednisolone, were declined by the cat’s owner.

Three weeks after the biopsy during a follow up telephone call, the cat’s owners revealed that the mass had disappeared completely 2 weeks after the surgery and that they could not find any other masses on the cat. Multiple requests to bring the cat back in for re-assessment were declined.

Six months after the biopsy the cat was represented. His weight had increased slightly since his previous visit (8.2kg) but he had had a reduced appetite over the previous 12-24 hours and had been making a snuffly noise during respiration for the previous 1 to 2 weeks. There was no nasal discharge, no facial swelling, no oral lesions and no abnormal masses detected on palpation of the throat or neck region. His rectal temperature was normal. The respiratory noise was isolated to the upper airway. The main differential diagnoses included upper respiratory tract infection (bacterial, viral, fungal infection), foreign body and, taking into consideration the previous history, nasopharyngeal neoplasm. He was started on antibiotics and it was recommended that further investigative work-up be undertaken if there was no improvement seen by the end of the medication course.

The cat was re-examined 2 weeks later – the cat had responded to the antibiotics but the snuffling recurred once the course was completed. He now weighed 7.8kg and had a markedly reduced appetite. There was a loud stertor and no nasal discharge. The eyes were slightly reddened but there was no oral discharge. No oral lesions were present and the rectal temperature was normal. A large smooth, painless mass approximately 6.5cm in diameter was palpable on the left side of the cranioventral neck region. The main differentials were nasopharyngeal neoplasia and fungal infection. Recommendations for further investigation with biopsy of the mass, endoscopic/radiographic examination of the nasopharynx and referral for MRI/CT scans were declined. Palliative care with prednisolone (on the presumption of recurrence of the lymphoma) was also declined. The only treatment option accepted by the cat’s owner was a repeat course of antibiotics for symptomatic control of the snuffling. The cat presented 2 weeks later with marked facial swelling especially across the bridge of the nose, bilateral proptosis, and loud stertorous respiration (Fig. 3). The mass on the left side of the throat had increased in size. Euthanasia was elected at this time.
Discussion
Spontaneous tumour regression without specific treatment is a known, but uncommon, occurrence. Here, it has been documented in both human and veterinary literature and is suspected to result from stimulation of the immune system by various mechanisms.1,3,4,8

Spontaneous regression occurs more commonly in indolent/low-grade lymphoma compared to the high-grade type. Low-grade lymphomas may not be fully-blown malignancies and so potentially respond more favourably to immunotherapy; however, they may become more aggressive and inflammation of the immune system may favour the growth of tumour cells with mutations in MHC genes.1,4 Mutations are more likely in cancer cells due to the inherent instability of their genome and high mitotic rate.

In this case it was suspected that the combination of an inflammatory response occurring with the trauma of the surgery and the potential exposure of cellular material from the centre of the mass to the immune system was enough to induce a significant immune response in the cat to cause regression of the tumour within a short period of time. The development of a rapidly progressive nasal condition in association with a large cerebral mass 6 months after the resection of the original mass was suspicious of an aggressive neoplastic condition, possibly related to the original lymphoma. However, this suspicion could not be confirmed by other conditions including fungal infections and neoplasia unrelated to the original mass were part of the differential diagnoses considered. The partial response to antibiotics was thought to be due to control of secondary bacterial infection.

Conclusion
The study of spontaneous regression of tumours has played an important role in the development of immunotherapy as part of cancer treatment, especially in humans. Tumour-specific vaccines, non-specific immunomodulating drugs have been used to treat cancer with varying degrees of success1,7, even when traditional chemotherapy has failed5.

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I would like to bring to the attention of the readers of Control and Therapy, the issue of delayed presentation of dogs that have been bitten by Tiger Snakes. Over the last summer I have examined 2 dogs and I have spoken to 3 veterinarians by telephone in relation to dogs that have presented with severe muscle weakness, atrophy and in some cases marked myoglobinuria. In each case the dog was seen to be ill in an initial consultation up to 10 days prior to presentation for muscle atrophy and weakness. Many of the dogs were initially examined for non-specific illness and or vomiting. In one case the dog went on to develop facial nerve paralysis. None of the dogs was suspected of having been bitten by a Tiger Snake and appropriate testing that would have confirmed the bite was therefore not run. It seems likely that many of these dogs were envenomed with a sub-lethal amount dose and therefore did not go on to develop clinical signs that would have alerted the clinician to the possibility of Tiger Snake bites. These dogs then go on to develop marked muscle disease due to a toxin called Notexin that is a component of Tiger Snake venom. This toxin appears to preferentially destroy red muscle fibres. Furthermore, exercise and exertion would seem to exacerbate the damage and so strict rest is a feature of treatment of these dogs to prevent complete muscle breakdown and failure of respiratory muscles. In one such case a dog required mechanical ventilation for 10 days.

There seem to be 2 very important factors in identifying such dogs. The first is a clinical suspicion in any dog with potential exposure to snakes. The second is the measurement of creatinine kinase (CK). Any potential increase in CK should be considered as suspicious for snakebite and any continued increases should alert the clinician to the possibility of a delayed presentation. It is unknown at what time the urine will become negative following snakebite for venom detection tests but it may be as early as 48 hours post bite. This makes diagnosis in delayed presentation problematic. The muscle damage as indicated by increased serum CK will usually become evident within 24 hours and urine may indicate trace myoglobin on dipstick. This should be an early warning to consider the use of snake anti-venom. It is also difficult to predict the usefulness of anti-venom beyond the first 48 hours post bite. However, it is becoming clear that identifying dogs that are a delayed presentation may be useful as restriction of exercise may result in a reduction in the muscle damage.

Restriction of any exercise for up to 2 weeks post bite is probably a good idea to try and reduce the muscle damage. Intravenous fluids may be needed in cases with pronounced myoglobinuria so as to prevent renal failure.

In several cases I have seen, the affected dogs have not had biochemical analysis run that did not include CK. This led to a failure to identify the problems as being related to a Tiger Snake envenomation. It would seem a good idea to me that commercial laboratories always include CK on biochemical analysis. Identifying increased CK in areas where Tiger Snake envenomation is likely may be the only early clue that allows prompt action.

Delayed presentation of Tiger Snake envenomed dogs

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Yesterday early afternoon, one of my cats (‘Pepe’), a 2-year-old healthy male DLH started to vomit in our living room, as cats do, so, as owners do (!), so we chuckled him outside so he could throw up in the garden instead of on the carpet. Later I noticed him sitting not far from the back door. A few hours later he was in exactly the same position which I thought odd. When he came in he vomited up a lot of brown water with the smell of faeces and collapsed. Two abdominal masses on palpation, a smaller, firm caudal one and a large, slightly softer cranioventral one which felt to be in the stomach and when palpated caused more fluid to come up – some out of his nose. Straight to the hospital – ultrasound could not identify the masses because they were surrounded by gas, but clearly in the gut. ‘General health profile’ was unremarkable except for a marked neutrophilia. Conscious later that night remarking unremarkable except stomach dilated, some gas but mostly soft-tissue density. His condition was deteriorating rapidly so he was put on a drip, administered a general anaesthetic and the stomach tube removed a lot of fœcal-smelling brown water. On ex-laparotomy, a solid fœtal impaction was seen jammed in the jejunum and a very large firm furball in the stomach – so enteroctomy and gastroctomy (what did you spend yesterday evening doing?).

Pepe recovered well the next day but was still put out on buprenorphine!

Moral – if your cat throws up, don’t just throw him out!

Pepe is out all night every night, and stays in all day every day (unless we throw him out because he is about to chuck up!). Despite being very long-haired moggy, he does not bring up furballs – my wife and I cannot remember him ever having done so. Instead, he saves them until he gets an intestinal impaction!

Here is a story with a moral for you

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References
Cutaneous asthenia: a case study

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Ducati

‘Ducati’ is an 11-month-old white neutered male Domestic Short Hair Cat who was presented on 20th April 2011 for a small mobile nodular hard mass on dorsum thoracic region caudal to scapula. No other skin signs observed. Ducati was otherwise healthy, HR180, pink and moist mucous membranes. Chest and abdomen are normal. Fine needle aspirate results reveal small numbers of cocci. Ducati was started on 62.5mg Clavulox drops PO twice daily for a week. Differential diagnoses included abscesses, cyst, foreign body reaction and neoplasia.

Client communication on 26th April to owner revealed that Ducati’s mass had responded slightly to antibiotics and owner thought mass was smaller but harder now. Ducati was rechecked and admitted for boarding, lumpectomy and histopathology on 30th April as mass had not resolved completely. Physical examination revealed that the mass had grown larger and more ‘lumpy’ and harder in consistency. Lumpectomy was planned for 2nd May. Prior to anaesthesia, the skin surgery vet found another mass subcutaneous nodular mass with a small abscess, cyst on the 31st May. Despite the changes, Ducati remained a smaller but harder. He also developed a new lump on the nuchal crest and on his occiput to its tail base. As he continued boarding with us, Ducati’s masses became smaller but harder. He also developed a new lump on the urogenital region of May. Despite the changes, Ducati remained a healthy cat otherwise. He was discharged from boarding on 14th June and is living a happy life at home.

Cutaneous asthenia (collagen dysplasia, dermatosparaxis)

This is a rare congenital hereditary disease in cats and dogs similar to Ehlers-Danlos Syndrome in humans. It is known to occur in many other species of animals such as mink, rabbits, horses, sheep and cattle (known by different names in different species – for example, the horse equivalent, hyperextensibility cutis, is becoming increasingly more common as it runs in cutting horses (line of Quarter horses). Note that this is NOT acquired skin fragility syndrome seen in older cats induced by drugs (e.g. prednisolone), endocrinopathies (hyperadrenocorticism) and other disease. Both diseases have similar presentations but signalment and history usually helps to differentiate them.

Cutaneous asthenia is characterised by defects in connective tissue of the dermis. It has been proved that defects in collagen structure are connected to a shortage of pro-collagen peptide and increased in collagenase activity. In cats, it is both autosomal dominant and recessive and has been found in Burmeese/ Himalayans/Persians/other long-haired breeds and Domestic Short Hair cats. No sex predisposition is found in any species.

Clinical signs are mainly confined to the integument. Affected animals have thin, hyperextensible skin easily torn and prone to injuries, like Ducati, our case. They develop bleeding wounds/haemorrhagic Hamomas mainly on the head and the neck. Most case reports in dogs, cats, horses and cattle had skin signs in the more dorsal parts of the animal (such as the trunk) rather than the extremities and the abdominal flap. They develop due to increased tensile strength in these locations. Cutaneous asthenia can manifest in joints (joint laxity in dogs and cats), blood vessels (increase fragility), ocular system (e.g. lens luxation) and pruritus alone or in various combinations.

Diagnosis is based on clinical signs and ancillary tests. It is important to perform skin extensibility index in a physical examination. The length of a skin fold is measured on the back by pulling skin away from the spine until able to elicit pain (Figure 1). The length of an animal is its length from occiput to tip of tail base.

Skin extensibility index = Length of a skin fold / Length of an animal × 100%

Average values are over 14.5% in dogs, over 19% in cats and 19.2% in rabbits. Values higher than these would increase level of suspicion for cutaneous asthenia. This is regarded as the most important clinical feature.

Sometimes histopathology (H&E and special stains like Van Gieson, Mallon, Masson) helps to confirm the diagnosis. Histopathology should reveal abnormal structure of collagen fibres that lay at a distance from one another and are fragmented, shortened and irregular in appearance. Definitive diagnosis usually involves usage of electron microscopy, which shows irregular structure of collagen fibres.

Prognosis is poor as there is currently no cure and skin can become increasingly fragile with age. Many animals are euthanased due to young age and severe clinical signs. Anecdotally, Vitamin C has been used in treatment of cutaneous asthenia with no drastic improvement. Dosages of 50mg per cat daily and 500mg per dog daily and it’s thought that vitamin C may increase collagen in the skin.

Post-Script: The patient was lost to follow-up as both authors left the clinic. However, Anita commented that although she can’t remember her records, they did measure the skin flexibility and estimates it was approximately 20-25%.

Reference

Figure 1. Size of surgical wound as compared to a 20 cent coin.

Figure 2 & Figure 3. Very stretchy skin shown as in the pre-up and post-up images above.

Cutaneous asthenia: a case study

Response to Gary Norsworthy’s comment:

Hairball obstructions of the intestines are uncommon in domestic cats – our practice’s 5 small animal vets can only remember seeing 1 case other than Pepe. However, they do occur and as Gary points out, evidence is accumulating that hairballs and, in particular trichobezoar obstructions, appear to be associated with underlying gut pathology such as inflammatory bowel disease or lymphoma, even in the apparent absence of any other signs of underlying gut pathology. Martha Cannon, an rCVS specialist in feline medicine, recently just submitted concerns 100 cats with confirmed small bowel disease. Each presented with chronic/recurrent vomiting, weight loss were far more common than diarrhea. Two of the cats in our paper had hairball obstructions. One had underlying inflammatory bowel disease, the other had lymphoma.

Chronic small bowel disease causes hypomotility resulting in vomiting and inability to move hair through the GI tract. The result is hair build up in the stomach and small bowel. Therefore, when a hairball obstruction is relieved surgically one should take full thickness biopsies of 2 or more places in the small bowel. One should avoid the immediate area of the obstruction as inflammation would be expected there. Biopsy 10+ cm oral and aboral from the point of obstruction. This process will allow you to understand the underlying pathology in the small bowel and put you in a position to prevent further disastrous events.

Response to Gary Norsworthy’s comment:

Hairball obstructions of the intestines are uncommon in domestic cats – our practice’s 5 small animal vets can only remember seeing 1 case other than Pepe. However, they do occur and as Gary points out, evidence is accumulating that hairballs and, in particular trichobezoar obstructions, appear to be associated with underlying gut pathology such as inflammatory bowel disease or lymphoma, even in the apparent absence of any other signs of underlying gut pathology. Martha Cannon, an rCVS specialist in feline medicine, recently just submitted concerns 100 cats with confirmed small bowel disease. Each presented with chronic/recurrent vomiting, weight loss were far more common than diarrhea. Two of the cats in our paper had hairball obstructions. One had underlying inflammatory bowel disease, the other had lymphoma.

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A 3-year-old female spayed domestic short-haired cat presented to the Alamo Feline Health Center for evaluation of respiratory difficulty of 19 days duration. The cat had an acute onset of sneezing with epistaxis.

The cat presented with paroxysmal episodes of severe sneezing which had been occurring for three weeks. These episodes began after the cat was let outside for the afternoon. When the cat came back inside, the owner noticed vomitus containing grass and blood on the floor. The owner also noted that the cat was experiencing severe bouts of sneezing. Prior to presentation at the Alamo Feline Health Center, the cat was evaluated by the owner’s regular veterinarian. On presentation the cat was bright, alert, and responsive. Physical examination revealed epistaxis and dysphagia. The patient received a dose of Convenia®. One week later the cat was reassessed by the same veterinarian. The patient was subjectively improved, but still experienced bouts of dysphagia and unilateral epistaxis. At this time the cat was administered an antihistamine, but there was no response. The cat was subsequently referred for further evaluation and rhinoscopy. Physical examination was unremarkable except for the respiratory system; where a lesion was localized to the nasal cavity or nasopharynx. Epistaxis was still evident from the right nostril. CBC and Chemistry testing using the Abaxis VS2 and HMG were normal. Endoscopy of the nasopharynx was performed using a 3 mm flexible rhinoscope. No foreign material was found, but a purulent discharge emanated from the right choana. Antegrade rhinoscopy was then performed using a 1.7 mm rigid arthroscope. A green object was visualized briefly approximately 1 cm from the right external naris. It was not possible to grasp this foreign body using forceps. However, retrieval of grass in this manner may result in tearing of the grass blade and retention of the caudal portion. A nasal flush was performed using 60 milliliters of warm saline in an attempt to dislodge the object from within the nasal cavity, but flushing did not yield positive results. Therefore a dorsal rhinotomy was performed the next day to explore the anterior right nasal cavity. Anesthesia was induced by the inhalation of isoflurane in an induction chamber and maintained using isoflurane for the duration of the procedure. Following a dorsal midline skin incision and dissection to the underlying bone, a 1.5 cm incision was made to the right of the midline using a power drill. The foreign body was blindly grasped with curved mosquito hemostats (Figures 1a, b, c).
Small Animals

Figure 1a: Progressive extraction of the grass blade through a rhinotomy incision.

Figure 1b: Progressive extraction of the grass blade through a rhinotomy incision.

Figure 2: The patient one week following rhinotomy.

Discussion
Nasal disease in cats can be infectious, allergic, neoplastic, congenital (due to anatomic defects), traumatic, or referable to a foreign body. Nasopharyngeal conditions such as polyps or nasopharyngeal stenosis may lead to similar clinical signs, in particular stertor, and should be included in the differential diagnosis. The type and location of nasal discharge assists in narrowing the list of differential diagnoses. Unilateral nasal discharge is usually seen with nasal foreign bodies and nasal neoplasia. Bilateral nasal discharge is much more common and may be due to all of the listed causes above. Nasal or nasopharyngeal foreign bodies occur infrequently in cats and are usually due to blades of grass lodged within the nasal cavity. Foreign bodies commonly reported in the feline nasopharynx include grass awns, grass blades, fish bones, pills, tablets, and sewing needles; basically, anything that can be swallowed, can be deposited into the nasopharynx following “inaccurate” emesis. The foreign body typically reaches the nasal cavity or nasopharynx during vomiting or regurgitation. This may also occur through direct antegrade introduction into the nasal cavity, although this is much less common in cats than dogs, on account of the smaller size of the feline nares. Most foreign bodies, including barbed grass awns, seeds, and blades of grass, favor one way migration and are difficult to expel backwards out of the naris. When the foreign body embeds into the nasopharyngeal region, periosteal clinical signs of stertor, inspiratory dyspnea, snoring, dysphagia, and epistaxis occur. These signs worsen as inflammation progresses. This case presented with a history consistent with nasopharyngeal debridement following gross vomiting. The acute onset of signs, initial dysphagia, presence of epistaxis, and antecedent vomiting of grass blades, strongly suggested this etiologic diagnosis. The presence of a foreign body can be diagnosed by radiography, endoscopy, nasal flush, blind exploration with forceps, or rhinoscopy. Additionally, a magnetic resonance imaging (MRI) or computed tomography (CT) scanning may be used to gain better resolution of foreign material within the sinonasal cavity. Radiographic signs in cats with rhinitis tend to be extremely variable. Radiopaque foci may be identifiable in cases of foreign bodies, but only if they are of bone, glass, hard plastic, or metal origin (i.e., sewing needles, metallic airgun pellets). Most nasal and nasopharyngeal foreign bodies result in little to no radiographic change. Some will demonstrate a unilateral fluid density. Due to the radiolucent nature of grass blades, radiology would have been of no benefit in the present case. Nasal flushing of the nares may be performed by packing the caudal oropharynx with gauze and flushing the nasal cavity with warm saline through a 24–28 Fr. urinary catheter. This technique may dislodge small particles from the naris. Rhinoscopy is commonly used to search for foreign bodies in the nasal cavity. Rhinoscopy is a valuable tool in viewing the internal structures of the nasal cavity, identifying anatomic abnormalities, and locating nasal foreign bodies. There is, however, a direct relationship between the diagnostic benefit of rhinoscopy and the size of the patient undergoing the procedure. Retrieval of a foreign body via direct visualization is preferred whenever feasible; however, this approach is usually thwarted by the anatomic limitations of the feline patient’s nasal cavity, the comparative dimensions of the instruments, the location of the lesion, and the presence of mucus and hemorrhage. Instruments must not be advanced blindly beyond the medial canthus of the patient’s eye to ensure that the instrument does not penetrate the orbitomeatal plate. Inadvertent penetration of this nasal anatomic barrier to the brain has obvious and potentially fatal consequences. In this case, only a “hint” of the foreign body was visible in the rostral right nasal cavity by rhinoscopy, but anatomic and instrument limitations prohibited retrieval of the foreign body with visual guidance. This “hint”, in addition to the cat’s history and the presence of purulent material in the nasopharynx, was deemed sufficient evidence to recommend surgical exploration of the right nasal cavity. In conclusion, the differential of a nasal or nasopharyngeal foreign body must be considered in cases with acute onset of severe upper respiratory signs, especially when the signs are unilateral. History and clinical signs may provide sufficient evidence to pursue further diagnostics regardless of the lack of abnormal radiological findings. Progression is good with removal of the foreign body.

References

So – External Markers in a nail clip:-

• There is a feel and a clicking ‘sound’ you get when clipping healthy nails. LEARN WHAT THE NORM IS by doing nail clips on healthy animals.

• In Diabetes and hypothyroid you lose that ‘click’ sound and when you check you find that the nails are softer, the blood vessel narrower and when you question the client, - yep, the patient is often drinking or urinating more or gaining weight. Poor/deficient diets can cause scurvy nails.

• Less near the tip as older growth and may not be affected if the SLO is onset recent.

• Canine Symmetrical Lupoid Onychodystrophy is more common than you think (Seavers, A. Sept 2009. Spotlight on SLO - Symmetrical Lupoid Onychodystrophy Treatment, The Veterinarian, Pg25-34.) and the nails show intense pain and ridging and splitting on the length of the shaft cranially – less near the tip as older and may not be affected if the condition is recent. Once you see the ‘popping the hood/bonnet’ picture (Figure 1) you will never miss this condition again.

• Yeast infections in the nail bed suggest allergy/atopy/contact/ allergy/autoimmune/canine hepatocutaneous syndrome depending on the age and breed of the dog.

• Shredded nails can mean separation anxiety as well as recent trauma.

• Long over-grown nails means the animal is left alone for long periods of time or never walked. They can also mean that the dog won’t let the owner near the nails to clip them, in which case behaviour modification and large emery boards are needed.

• Long nails also suggest the dog can’t walk due to pain in the toes or because the nails are so long they physically bend the digits out of correct placement alignment. Abnormally worn nails imply neurological issues.

• Nails are a bit like the markers of internal disease that indicate a bitch licking her vulva/dog his prepuce are often the first signs of diabetes or bladder stone, as well as the normal contact/fold issues.

Read next C&T edition in Sept for a huge gallery of images provided by our colleagues from around the world of not only canine but also feline nail disease presentations that may present as a lameness/neuro cases when they are in fact primary dermatology/neoplastic/bad management conditions.

WINNER

External markers of internal disease; the ‘not-so-humble’ nail clip

A nail clip should be mandatory before an MRI or CT!

C&T No. 5312

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I know, we hate hate nail clips and lob them off to the Nurses as fast as we can. But there is a mine of information on a nail clip – it’s a HULU every time right in front of you, as good as any expensive blood screen!
**Invited Comments courtesy of**

**No. 1**

**Richard Gowans**

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**MACKS (Small Medicine)**

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We too were intrigued by this regarding secnidazole as a single modality treatment for Giardia in cats following on from its excellent results in human giardiasis. We too see many cases of Giardia in mostly purebred cats. These are confirmed by fresh faecal exams, faecal antigens IDEXX SNAP tests or Faecal PCR’s (many cats also have intercurrent Trichomonas infections). We have treated 20+ confirmed cases with secnidazole 30mg/kg single dosing since reading this publication. I would say our clinical impression is that it is certainly a useful medication with about 90% cure (post dose antigen testing) or positive clinical response. But we have likely seen more treatment failures compared to our impressions of the clinical efficacy of 5 days of fenbendazole 50mg/kg PO 5 days. We would see this difference as being in part due to the necessity for environmental control of giardiasis in multi-cat households with re-infection being common. Repeated dosing may be required for improved efficacy to catch any environmental re-infections. The largest benefit of secnidazole is the single dose, readily compounded into a single capsule dose – but at a cost. Fenbendazole is cheap but can be difficult to administer to cats due to its yucky taste.

We did initially hope that secnidazole may show clinical efficacy against Trichomonas foetus, but this certainly has not been the case, with unresolved PO-SD 14 days being the only proven therapeutic at this point. We certainly do use secnidazole in empiric therapy where giardiasis is highly suspected or as a rule out option in cases of chronic diarrhoea in young cats.

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**No. 2**

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I, like Jim, have also found secnidazole to be a great one-dose treatment for feline giardiasis. I have only used the dose recommended by Da Silva et al., which is 30mg/kg (rather than 30mg/cat). I recommend testing cats for Giardia sp. before and after treatment with secnidazole to both confirm a diagnosis and demonstrate resolution of the infection. Thus far in 2 cases (out of 19) I have found cats still testing positive for Giardia sp. after and before treatment with secnidazole; however, it is unclear whether this was due to re-infection or drug failure. In cases of persistent giardiasis I recommend re-treatment with secnidazole @ 30mg/kg and if this is still unsuccessful then fenbendazole @ 50mg/kg BD for 7 days or fenbendazole @ 50mg/kg SID for 5 days. The environment should also be carefully investigated for sources of possible re-infection, for example the stocking density, disinfectant used, and the frequency of litter cleaning.

With this amount of dentin exposed, and such rapid enamel deterioration, the teeth would most definitely be painful for Tinta and prognosis for quality of life without major treatment was poor. There was no guarantee in this case that the dentinal...
Acute skin necrosis in a Kelpie

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Marilyn treated this case whilst working at Springfield District Vets.

Day 1: ‘Jack’, a 6-year-old, male, neutered, red Kelpie presented to the clinic for ‘not quite right’. He had been lethargic, inapetant, and no vomiting or diarrhoea had been noted. On presentation his abdomen was comfortable; he was tachycardic and was pyrexic with a temperature of 40.7°C. The only other abnormality found on examination was an oedematous swelling on the left side of his ventral thorax measuring 15cm x 5cm, which the owners said they had noticed in the last few days, which looked very similar to a previous case of suspected spider bite.

In-house general health profile (CBC and Biochemistry) and urinalysis was performed. There were no abnormalities on CBC and Biochemistry, except for a stress leukogram, and the urinalysis showed a USG of 1.010, WBC x1 (but not demonstrated on microscopy).

A fine needle aspirate of the swelling revealed a few neutrophils, although free fluid was not able to be aspirated.

The dog was treated with a carprofen injection and re-checked the next day.

Day 2: The next day Jack’s temperature was within the normal range (38.6°C) and he seemed slightly improved in himself, but was still not eating. The swelling on his ventral chest appeared to have increased in size. A fine needle aspirate of the area was repeated, and this time blood constantly dripped from the site, after the needle aspirate was performed. An activated clotting time was performed and was within normal limits (clotted at 100 seconds). Jack was admitted for intravenous fluid therapy of Hartmann’s Solution at twice maintenance rates and a bandage was applied to his chest. He was also started on a course of oral Enrofloxacin® and Carprofen®. By the afternoon, the swelling had extended caudally, to just cranial to the prepuce.

Day 3 to Day 5: Jack stayed in hospital over the weekend and started eating chicken. His temperature remained within normal range however the swelling had increased markedly. I thought at first the cause was IV fluids going extravascular. However the original area of swelling was now akroscopic; this area was clipped and revealed a large area of erythematous and black skin. The black areas were moist. At least 3mL of haemopurulent fluid was aspirated, and a Diff-Quik® stained smear revealed cocci +++, some rods and degenerate neutrophils +++. The owners were informed that the area should be drained and cultured; however, they declined culture. To save on funds, Jack was sedated with acepromazine and methadone and local anaesthetic was injected into 2 sites, and the skin incised with a scalpel blade. The area was lavaged with saline and penrose drains were placed.

The owner was advised that more tissue could necrose, so surgery to remove the blackened skin was withheld at this stage. The plan was to continue Norocla® tablets for 3 weeks, and Carprofen® as required.

Day 7: A re-check was performed 2 days later, and more tissue was breaking down cranially with fluid draining from this site. The owners had been bathing the area with Dettol®, which they were told not to do. A repeat cytological exam was performed, which revealed similar findings. Jack was re-admitted and a course of Enrofloxacin® was added to the therapeutic regimen and was to be continued for 2 weeks, until the Norocla® course was finished.

Day 8: The eschars that had developed were sloughing off, and surgery to resect the necrotic tissue was performed. Jack was given a pre-med of acepromazine and methadone, induced with thiopentone, intubated and maintained on isoflurane in 100% oxygen. When the skin was being prepped, the eschars were mobile and could almost be pulled away prior to surgery. Large amounts of necrotic skin, subcutaneous tissue and some muscle was removed; the subcutaneous tissues were lavaged with copious amount of saline and penrose drains were placed. The owners were given a guarded prognosis for healing uneventfully.

Day 11 and Day 15: Some of the penrose drains were removed 3 days later and the rest 5 days later. The suture line was looking fine.

Day 24: The sutures were removed 14 days later and all healed well. A definitive diagnosis was never achieved, but I thought that a spider bite was most fitting, but am not sure how exactly to definitively diagnose this.

In many cases the prognosis for a healthy life is good, if the tooth roots are normal, and many animals can live a relatively normal, comfortable life in the care of an observant owner.

Figure 1. Day 5 after placing penrose drains in ventral most areas. Note the erythema surrounding the black skin.

Figure 2. Day 8, eschars sloughing off, prior to surgery.

Figure 3. Surgical resection of all compromised areas.

Figure 4. Day 11, 3 days after surgery before removing some of the penrose drains.

Figure 5. Day 24, Sutures were removed 14 days after surgery and had healed well.
Fulminant ascites: options, drugs, batteries and scalpels

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A. Zarocoxylin-Metazolone
Zaroxalyn is, like any other NSAID/gastroprotective, is a popular drug used by overseas veterinarians for severe ascites cases. My literature search suggests it might be a safer option than spironolactone as the potential gastro-oesophageal side-effects of spironolactone are not reported with Zarocoxylin so perhaps a good option for German Shepherds (GSDs).

I have had GSDs on spironolactone where the inappetence and cachexia was put down to cardiac causes when in fact it was an undiagnosed gastric ulcer (in the same way I saw the GSDs were too late to reverse and the dog died to 48hrs later).

Works well in renal failure cases. However, advised not to use in Sulphonamide sensitive cases. So that rules out Dobermanns and additionally for me that would mean Centurions as they can throw a nasty sulphonamide-induced hypochloremic metabolic acidosis.

A USA colleagues use 5 mg/per dog per day along with the Lasix which is in the special home burial bag the family had personalised and

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* Z. J. Goodrich†, L. L. Powell, K. J. Hulting. Feb 2013. A recent paper validates the fluid into the bladder. It worked for a couple of months and whilst

Check out C&T No. 5318 – how many owners

C&T No. 5319
Invited Comment courtesy of:
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Reply to C&T No. 5172 – Elevations in ALT and gall bladder ultrasound changes in anaphylaxis – 2 case reports (Issue 26 Dec 2011)

The dog was unable to eat the day before and had a little milk and had a bloody vomit on the way to the emergency vet. He was given a fluid load on arrival and had good heart sounds (lungs were clear). The next day he was weak and had episodes of vomiting and incontinence.

Reply to C&T No. 5273 Chronic cystitis: driving me crazy (Dec 2012, Issue 269)

C&T No. 5274

Small Animals

Control & Therapy Series – 21 JUNE 2013

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Control & Therapy Series – 21JUNE 2013

Authors' views are not necessarily those of the CVE

Authors' views are not necessarily those of the CVE

Proteus mirabilis urinary tract infection (UTI) in a CKCS

Rosie certainly represents a frustrating UTI case and a large amount of clinical work has been put into gaining a response. For others, results and purposes, Rosie appeared to present initially with a simple uncomplicated UTI (otherwise healthy dog) but time revealed it to be difficult to cure. Not what a common cause (<10% of cases) of recurrent or persistent bacterial cystitis, Proteus spp can certainly prove difficult to eradicate in some patients. In Rosie’s case, the infection most likely remained there the heart of the cystitis as the urine was not in fact sterile because sterility of the urine was documented on one occasion

So why did ‘Rosie’ fail to respond to apparently reasonable treatment? Pain is never helpful in relation to healing and it is our duty to

Veterinary Education

Fever is not a good indicator of a good infection. I have had fevers in dogs with bacteremia and in cases of cellulitis. In people (also see Anaphylaxis – A. Litster, PhD; Uni Qld) mast

Oral DEG dosages in dogs with (2, jimmits) microfilaria. While the exact shock mechanism of the leishmaniosis preestablished-intestinal was not established, these percentage ALT changes were an objective indication of a ‘shocked’ liver (i.e. dog shock, most shocked organ).

In people (also see Anaphylaxis – A. Lipster, PhD; Uni Qld) mast cell degranulation can be used to verify a truly anaphylactic reaction (i.e. acute profound mast cell release of multiple species-specific mediators – elastase being of diagnostic value but the test is time- limited, to 6-8 hours, after the signs of shock).

With a stop cock on your extension tubing and reposition for continued drainage.

Watch for kinking/blocking due to Omentum (which sometimes

So why did ‘Rosie’ fail to respond to apparently reasonable treatment? Pain is never helpful in relation to healing and it is our duty to

As previously noted, the administration of fluids (or ‘drip’ or ‘IV line’ treatment) may be the best form of pain relief in certain conditions, such as osteomyelitis and fractures. It is important to ensure that the fluid delivery system is adequate for the size of the patient, and that the rate of fluid administration is appropriate for the patient’s individual needs.

Frozen saline is a practical and cost-effective alternative to other intravenous fluids, such as lactated Ringer’s solution. It can be administered at a lower rate, which is particularly beneficial when dealing with small or neonatal patients. Additionally, it provides a concentrated source of sodium and potassium, which are essential for maintaining electrolyte balance and cellular function.

I finally had IV morphine (with metoclopromide) at the hospital

Another point to consider is the use of pain management protocols. Many hospitals and veterinary practices have developed specific protocols for pain management during anesthesia and surgery. These protocols may include the use of NSAIDs, opioid analgesics, or a combination of both. It is important to follow these protocols carefully to ensure adequate pain control.

I finally had IV morphine (with metoclopromide) at the hospital

Sulphonamide sensitive species. As such, the clinical presentation of these cases may vary depending on the specific species involved.

I finally had IV morphine (with metoclopromide) at the hospital

I finally had IV morphine (with metoclopromide) at the hospital

I finally had IV morphine (with metoclopromide) at the hospital

I finally had IV morphine (with metoclopromide) at the hospital
What's YOUR Diagnosis?

Replies and Comments

- Choosing AMXC to treat the low-grade UTI was not associated with a significantly lower dose of prednisone. The authors also noted that the combination of prednisone and AMXC may not be as effective as prednisone alone.

Tips for monitoring dogs with relapsing or refractory infection:

1. Culture urine (cystocentesis sample)
2. Obtain cultures of lesions on two separate occasions
3. Use alternative antimicrobials
4. If the infection is not responding, consider the possibility of other underlying causes

A diagnosis of recurrent UTI should never be based on clinical signs alone. A recent urine sample will help to confirm recurrent UTI.

Culture urine (cystocentesis sample) 5-7 days after commencement of therapy. Bacterial growth indicates potential treatment failure and should prompt immediate re-evaluation. Referral or consultation with a specialist at this point is recommended.

Urine culture 7 days (3 weeks for cotrimoxazole) after therapy is completed is also required and if positive, then in-depth investigation of predisposing factors for relapse or reinfection should be performed. Unrelenting relapse is the reason for failure, retreatment without any other investigation is not recommended.

If there is a lack of clinical response to treatment or if clinical signs of >20 mg/kg of cefovecin are not present after successful treatment then the animal should be managed again as above, with particular emphasis on determination of underlying causes.

References


Answer to What’s YOUR Diagnosis?

C&T No. 5282 (Mar 2013 Issue 270)

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I must applaud Heather and the photographer, Tracey, for the final photos of the treatment of penile and or preputial lesions in bulls. In the past I have had similar lesions resolve with surgical treatment and preputial or penile reconstruction. I would like to reiterate the importance of careful evaluation of the lesion before any treatment is started. However as I have no current cases, all I can offer is a very basic drawing (however I did get a better artist than myself to help me that the image wouldn’t look too laughable.)

My main comment however is that this bull(s) must have been extraordinarily co-operative as all my patients manage to either rotate the sling or have it slip forward or back while moving around in the paddock.

So I made use of the sling to make a complete wrap around of the prepuce. This was 2 chaff bags stitched together loosely with hay baling twine and a bag sewing needle (or in an emergency your pegs will do). This is very difficult to get hessian chaff bags as they are nearly all wovenpoly or poly material which would be abrasive and totally unsuitable. I have found some produce stores still do stock hessian products so it shouldn’t be impossible to find.

Then to stop it slipping back I tie twine around the NECK with a knot to keep it stable. I tie the slit with this to 3 separate twines, 1 along the back and 2 along either shoulder. The ties can be looped into the slit with a slip knot to allow the slit to be adjusted.

Then a BRITCHING string is tied around the back end slightly above the stifle level to stop the sling moving forward.

The bull can urinate through the bottom of the slit so I always advise the cow to have the bottom of this piece with felt hand as a piece of old sheet.

I also advise the owner to make two slings so one can be removed daily, the lesions can be cleaned and a fresh sling can be put on while the old one is hosed and hung on the fence to dry.

Other Things I Would Do:-

1. As above I would treat and clean daily. I found if the bull was always fed hay or some grain mix in the crush during treatment it was easier to keep getting him in.
2. The prednisomed would probably be fine although I used to use a non greasy udder cream like Hibitane or the old Ceatto mixture (of which I have seen around for some time). I just felt they would attract less dirt onto the lesions.
3. I used to clip the preputial hairs away to try and reduce some contamination but also to try and loosen the hair catching on prolapsed tissue when it started to retrae into the prepuce.
4. I would have probably given about 3 doses of long acting penicillin 40 hours apart e.g. 50 mLs Benzilicin i.m, but am totally in agreement in using tolledine or similar anti-inflammatory at the start.
5. I would have preferred to keep slinging until the prepuce had healed entirely, as in Figure 3 of the article I feel there is risk of re-injury.

Prevention of adhesions after prolapse resolves.

Sometimes the penis can retract up into the prepuce while it is still quite upright.

I used to get the farmer to squat in a stoated position like Mastubate but this was always quite expensive and probably went nowhere in an area as large as the prepuce.

I eventually worked out to use a soft hose or old chast tube with a stump pump. Fill the prepuce with water then hold off the tip of prepuce with your fingers then with the other hand massage the prepuce and slosh all the liquid around. I would repeat 3 or 4 times and keep treating daily until I was sure no adhesions were forming.

A couple of times I sedated the bull to examine the penis before stopping treatment.

Key points are:
1. The sling ideally made of 2 chaff bags sewn together then loosely tied together so it can be removed easily.
2. The neck tied with a reef or other non slip knot.
3. One of 3 ties going back from the neck rope to the sling.
4. The britching tie attached to the sling on both sides.
5. Where the small preputial knot is placed in the sling to try and stop the preputial hairs being abraded on the hessian.

To answer the Your Diagnosis Question:

C&T No. 5290 (Mar 2013 Issue 270)

C&T No. 5321

Marylin Neale
Albert Animal Hospital
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Springwood QLD 4127
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The radiographs show a stomach that has herniated through the left side abdominal wall, and a diagnosis of diaphragmatic hernia.

Note: Marilyn is the Winner and entitled to a CVE proceedings of her choice. www.vetbookshop.com

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Perspective
How to best monitor diabetes in cats

Linda Fleeman
Animal Diabetes Australia

Monitoring clinical signs and response to therapy

Establishing a practical routine for the cat’s owner

Many owners of diabetic cats welcome the opportunity to monitor their pet’s response to therapy, although compliance can be very variable. Compliance is markedly improved if there is close rapport between the owner and the clinician managing the case, and appropriate individualisation of the cat’s therapeutic and monitoring regimen. The veterinary clinician must invest time to educate the owner about feline diabetes and its management, as well as to provide support and guidance while the owner becomes accustomed to the treatment and monitoring procedures and establishes a practical routine.

The primary aims of therapy in diabetic cats are to achieve good control of clinical signs and to optimise the chance of diabetic remission. Diabetic remission is most likely when the blood glucose concentration is kept below the renal threshold. Higher blood glucose concentrations cause ‘glucose toxicity’ which results in dysfunction of any remaining beta cells. This effect can be reversible and so there is often recovery of beta cell function once a diabetic cat achieves persistent negative glucosuria.

Decreased insulin requirement is typically seen 1–2 weeks after the onset of negative glucosuria and it is important to then reduce the exogenous insulin dose to avoid hypoglycaemia.

It is very helpful if owners can test urine glucose daily in addition to regularly monitoring signs such as the volume of water drunk and body weight. Most cats will readily cooperate with urine glucose testing. Cats that use a litter tray will often urinate immediately if their owner changes the litter while the cat is in the room. Cats that do not use a litter tray will typically allow urine sampling if their owner accompanies them when they are let out into the garden in the morning. A dipstick can be applied to urine-soaked litter or soil while it is still wet. Application of petroleum gel prior to blood sampling facilitates beading of blood on the skin surface and thus allows sampling using smaller volumes.

Monitoring daily water intake provides a very useful guide to the current level of glycaemic control in diabetic cats. Average blood glucose concentration correlates positively with 24-hour water intake. It is helpful for the veterinarian to educate their clients on the normal water intake of cats because most owners are not familiar with this. Normal young adult cats eating a 100% dry cat food control their water intake to 30 mL/kg/day, while they drink little or nothing when eating a diet of canned food. If a diabetic cat drinks more than 40 mL/kg/day, or is lethargic or losing weight, then adjustment of the insulin dose is probably required.

Owners of diabetic cats should be encouraged to keep detailed records of their cat’s progress.

1. Appetite, general demeanour and behaviour. This should be reviewed every day.
2. Meal amount and composition should also be recorded every day.
3. Insulin dose. This should be recorded twice each day.
4. Water intake. This should ideally be measured every day when the cat is receiving insulin and once a week when the cat does not require insulin. The key is to determine how many millilitres of water the cat drinks over a known number of hours. If the water bowl is shared with one or more other cats, then the volume drunk by all cats should be measured.
5. Urine glucose and ketones. This ideally requires collection of a sample of urine every day. This can be either a liquid sample or some wet kitty litter or soil that has been moistened using tap water.
6. Body weight. Ideally, a diabetic cat’s body weight should be recorded once each week. It is important to use the same scales each time the cat is weighed. Scales designed for weighing adult humans are not always suitable for monitoring glycaemia. The veterinary clinician must review the cat’s clinical history with the owner to determine how much weight is normal for the cat, and how much weight the cat is losing.

In addition to appraisal of the owner’s insulin dosing technique, compliance of both the owner and the patient with the feeding recommendations must be routinely evaluated. Appropriate nutritional strategies can complement insulin therapy in diabetic cats and so it is often beneficial to make changes to the diet or feeding regimen. The lowest carbohydrate foods are the best for diabetic cats. Most canned and wet cat foods have a very low carbohydrate content. The only dry cat foods that are permitted are the ones specifically formulated for diabetic cats, such as the Hills m/d® dry food or the Royal Canin Diabetes dry food. Meals may be consumed at any time and do not need to be matched with insulin injections.

Measurement of long-term glycaemia: fructosamine

Measurement of fructosamine is an additional way of assessing glycaemic control. Persistent clinical signs are usually sufficient. Plasma fructosamine provides an approximate measure of average blood glucose concentration over the preceding 2–4 weeks and thus is an indicator of longer-term diabetic control. Measurement of fructosamine is most useful when there is little available information about recent clinical signs of the diabetic cat. or when results of serial blood glucose measurements do not match with the reported clinical signs.

Comparison of serial measurements of fructosamine in an individual diabetic cat allows evaluation of glycaemic response to management changes. This is a limitation with these measurements is that they represent average glycaemia and give no information about the degree of fluctuation around that average. Therefore they do not indicate the risk of hyperglycaemia on the current insulin regimen.

Monitoring blood glucose concentrations at home

Some owners are interested in performing blood glucose monitoring at home, particularly those who desire more autonomous control over their cat’s diabetes. Owners who choose this method of monitoring sometimes need to be advised against over-zealous blood glucose measurement and interpreting the results themselves. Other owners are unwilling to add home blood glucose monitoring because they feel it is an added source of stress. The majority of uncomplicated diabetic cats can be well managed if owners closely monitor clinical signs and urine glucose and do not require additional blood glucose testing. Complex cases however benefit greatly by the introduction of home blood glucose concentration measurements to the monitoring regimen.

Samples can be obtained either from the marginal vein of the lateral pinna or by collection of capillary blood from the medial pinna. Application of petroleum jelly prior to blood sampling facilitates beading of blood on the skin surface and thus allows sampling using smaller volumes.

Owners should be encouraged to purchase a veterinary blood glucose meter because human glucose meters give a falsely lower blood glucose compared with both veterinary meters and laboratory reference methods. Veterinary glucose meters currently available in Australia are the AlphaTRAK meter (Animal Diagnostics UK) and the g-Pet meter (The VetService Group in New Zealand).

There is considerable day-to-day variability in blood glucose measurements in diabetic cats. Single, sporadic measurements are of little useful clinical information for monitoring glycaemic control. The major advantages of home-monitoring of blood glucose concentration are that measurements can be easily obtained at any time and can be repeated if equivocal results are obtained. The cost is minimal compared with a veterinary visit, and the effects of hospitalisation on appetite and stress hyperglycaemia are avoided. Serial blood glucose concentration curves that follow the same protocol as those obtained in hospital can be performed at home. Results must always be related to the cat’s clinical signs to understand the complex interactions involved in glucose homeostasis in diabetic cats.

Serial blood glucose concentration curves are most useful in cases where the clinical history is poor. However, it is important to recognise that they are an unreliable clinical tool for evaluation of insulin dose in diabetic cats because the clinical history is often inconclusive and variability of hours. If the water bowl is shared with one or more other cats, then the volume drunk by all cats should be measured.

Problem-solving difficult cases

Difficult monitoring glycaemic response – results do not match the cat’s clinical signs

Glucose homeostasis in cats is a dynamic process that can change very rapidly. Cats with diabetes have dysfunctional glucose homeostasis and are thus much more prone to variability of blood glucose concentrations, especially in response to stress or illness. A common error when managing diabetes is to assume that the condition can be ‘stabilised’ and that measurements taken on one day are representative of diabetic control on other days. A more appropriate approach is to establish an ongoing monitoring regimen that will detect the changing trends in the cat’s response to treatment. Improved activity, resolution of polyuria and polydipsia are all indicators of improved glycaemic control. It is important to realise that negative glucosuria can occur at any time once clinical signs have subsided and may occur within days, weeks, or even months of the last insulin dose adjustment. Once the blood glucose concentration is stabilised around the renal threshold, their cat’s insulin dose will usually decrease substantially. However, the rate of diabetic remission appears to be optimised if the insulin treatment is withdrawn gradually, with a dose decrease every 1–2 weeks. In contrast, a rapid cessation of insulin can result in recurrence of hyperglycaemia, return of glucose toxicity, and increased requirement for exogenous insulin.

Micro-management of feline diabetes with frequent insulin dosage adjustments should be avoided. In general, insulin dosage adjustments should not be made any more frequently than once every 1–2 weeks. The exception is following an episode of hypoglycaemia, which should always be repeated if equivocal results are obtained, the cost is small, and provide information overnight or when the owners are not at home. One limitation is that they must be calibrated with blood glucose concentration, so there is still a requirement for some blood sampling during monitoring.

A practical approach is to use knowledge of the cat’s clinical signs to guide the timing of home-generated blood glucose measurements. Measurement of fructosamine is most useful when there is little available information about recent clinical signs of the diabetic cat. or when results of serial blood glucose measurements do not match with the reported clinical signs.

Comparison of serial measurements of fructosamine in an individual diabetic cat allows evaluation of glycaemic response to management changes. This is a limitation with these measurements is that they represent average glycaemia and give no information about the degree of fluctuation around that average. Therefore they do not indicate the risk of hyperglycaemia on the current insulin regimen.

Continuous interstitial glucose concentration monitoring systems

Continuous interstitial glucose concentration monitoring systems such as the Guardian REAL-Time Continuous Glucose Monitor (Medtronic, Sunnyvale, CA) can be used in the home environment or in hospitalised patients to monitor glycaemia. Important advantages of continuous monitoring systems over intermittent sampling of blood glucose are that they facilitate detection of brief periods of hyperglycaemia and provide information overnight or when the owners are not at home. One limitation is that they must be calibrated with blood glucose concentration, so there is still a requirement for some blood sampling during monitoring.
Unexpected hypoglycaemia

Daily recording of urine glucose provides a useful ‘early warning system’ for the risk of clinical hypoglycaemia for most diabetic cats. Decreasing the insulin dose within 2 weeks of the on-set of hypoglycaemia will thus ensure that hypoglycaemia is avoided in the majority.

The owner’s insulin administration protocol should be carefully evaluated whenever hypoglycaemia occurs to identify dosing errors. It is strongly recommended that insulin injections are administered at strict 12-hour intervals. Irregular timing of insulin injections can lead to overlap of insulin action with that of the previous dose. If it is not possible to administer an insulin injection on time, then the best approach is to miss that injection and resume insulin administration at the next injection time. Missing a single injection will usually have negligible consequences. In contrast, late administration of insulin can lead to increased insulin action (and therefore over-dose) if the following insulin injection is administered on time. The usual meals can be fed whenever an insulin injection is missed.

For cats that are prone to hypoglycaemia, longer-acting insulin preparations such as glargine insulin are recommended as these will likely have a smoother action and so minimise periods of both hyper- and hypo-glycaemia.

Feline diabetes that is complicated by concurrent disease and/or medications that are causing insulin resistance will typically present with very unpredictable blood glucose results that vary anywhere from 1.5 mmol/L to 30 mmol/L, despite consistent insulin dosing. Such cases will often roughly follow a 3-day cycle fluctuating between the above ranges which might present with intermittent hypoglycaemic seizures. Measurement of blood glucose concentration by owners immediately prior to each insulin injection can greatly help to guide insulin dosing in these cases. An example of dosing recommendations that were developed for an individual diabetic cat that has chronic pancreatitis/inadequacy and requires prednisolone and chlorambucil treatment is as follows. Note that these recommendations are based on blood glucose measurements using a veterinary glucose meter.

- Measure blood glucose prior to each insulin injection:
  - If blood glucose is 15.0 mmol/L or greater, give 5 units of insulin.
  - If blood glucose is 10.0–14.9 mmol/L, give 4 units.
  - If blood glucose is 6.0–9.9 mmol/L, give 3 units.
  - If blood glucose is 3.8–5.9 mmol/L, give 2 units.
  - If blood glucose is 3.7 mmol/L or less, give no insulin.

Such an approach provides owners with a practical tool to avoid clinical hypoglycaemia and achieves reasonably good control of the clinical signs of hyper-glycaemia. A range of insulin syringes are available and conveniently changing to a different type of syringe can lead to dosing errors. Dosing errors are less frequent with insulin dosing pens than with needles and syringes. However, insulin dosing pens must be primed prior to administration of each dose to ensure there is no air in the system. It is also important to check that the dosing dial has returned to the ‘zero’ position after each dose.

High insulin requirement (>5 units/cat) or an unexpected increase in insulin requirement

Most diabetic cats require doses of 5 units/kg or less of glargine insulin administered every 12 hours. Occasionally an individual cat will need 6 or 7 units before good glycaemic control is achieved. Insulin doses should always be based on estimated ideal body weight rather than actual body weight in underweight or overweight cats. Once persistent negative glycaemic control is achieved and insulin requirement decreases, many cats will go into remission and the remainder will typically require 3 units or less of insulin every 12 hours.

An unexpected increase in insulin requirement is recognised when a cat that has been in long-term diabetic remission needs insulin thereafter or when a cat that was initially only a low insulin dose for months unexpectedly requires higher doses.

The major differential diagnoses for a diabetic cat to require more than 7 units of insulin every 12 hours or for an unexpected increase in insulin requirement are:-

- Error in insulin handling or administration
- Obesity
- Concurrent disease or drug therapy
- Compensatory hyperglycaemia secondary to insulin overdose

Error in insulin handling or administration

Insulin can become inactivated if exposed to temperatures >35°C or light for prolonged periods. An expedient method of ruling out the possibility of inactivated insulin when investigating insulin resistance is to change to a new vial of insulin. Insulin suspensions must be thoroughly mixed prior to administration or doses might vary greatly.

Although experienced owners of diabetic cats rarely report difficulty with administration of insulin to their pet, it is important to review their injection technique for errors whenever insulin resistance is investigated. A wide range of insulin syringes are available and inadvertently changing to a different type of syringe can lead to dosing errors. Dosing errors are less frequent with insulin dosing pens than with needles and syringes. However, insulin dosing pens must be primed prior to administration of each dose to ensure there is no air in the system. It is also important to check that the dosing dial has returned to the ‘zero’ position after each dose.

Error in insulin overdose

For diabetic cats with poor glycaemic control that are receiving insulin doses greater than 1.5 units/kg where administration dosing errors and concurrent disease/drugs have been ruled out, it is recommended that the insulin dose be decreased to 0.5 units/kg and the response to this change monitored. Insulin resistance was due to compensatory hyperglycaemia secondary to insulin overdose, there is typically marked clinical improvement within 1–2 weeks. If there is another cause of insulin resistance, clinical signs typically become much worse within a few days and the previous insulin dose can be resumed and the investigation for another cause continued.
Case report

A 5-year-old male desexed Whippet was presented on Good Friday 2011, with sudden onset of non-weightbearing lameness in his right hind leg. Clinical examination revealed moderate to marked swelling of the caudal medial thigh proximal to the stifle. The skin in this area was bruised in appearance. Temperature was 40.9°C, heart rate 140 bpm, respiratory rate 24 bpm. Regional lymph nodes were not enlarged. No other clinical abnormalities were detected. No cause of the bruising could be found. Supportive treatment with antibiotics (Amoxicillin / clavulanic acid 20mg/kg q 12hr) and pain relief (Meloxicam 0.1mg/kg po q 24hr) was started.

Over the next 3 days the dog’s condition progressively worsened with swelling of the leg extending to the distal limb. Large areas of the skin appeared necrotic. The limb was cold to touch and serious fluid oozing was apparent in some areas. Enrofloxacin 10mg/kg q 24hr was added to the medical regime. Multiple releasing incisions were placed along the limb to help relieve pressure and a compression bandage was applied. This helped reduce the swelling a little but did not prevent necrosis of the skin from the caudal thigh and medial stifle extending distally to the hock.

Histopathology

A biopsy was taken from 2 areas at the margin of normal and abnormal tissues during debriding. Histopathology results revealed a “severe neutrophilic and fibrinoid cellularity with cutaneous infarction”. The pathologist’s report read as follows:

1. One of the sections is characterised by extensive necrosis involving the epidermis, adnexal structures and extending into the subcutaneous tissues. The subcutaneous tissues are expanded by large numbers of neutrophils that are variably degenerate together with abundant fibrin and oedema. A number of vascular structures in the adjacent soft tissues contain fibrin thrombi. The other section has a margin where there is a defect extending into the subcutaneous tissue. There are abundant neutrophils extending into the subcutaneous tissues and these are intermingled with fibrin and oedema. A number of vascular structures are occluded by fibrin thrombi and some appear to be organising. Streams of neutrophils within the expanded and oedematous connective tissue extend beneath intact serocutaneous tissue.

After online consultation with other veterinarians through the Veterinary Information Network (www.vin.com) we began treatment with pentoxyfilline 15mg/kg q 12hr.

Pentoxyfilline is a xanthine derivative which enhances peripheral blood flow and tissue oxygenation.1 The mechanism of action is not fully understood but may involve relaxation of smooth muscles of the peripheral vessels causing vasodilatation. Pentoxyfilline also increases flexibility of the red blood cell and promotes platelet de-aggregation. These two effects contribute to a decrease in blood viscosity and improved movement of blood through peripheral blood vessels. In human medicine pentoxyfilline is primarily used for the treatment of chronic occlusive peripheral artery disorders of the extremities.5 More recently pentoxyfilline has been investigated for its potential use in aiding healing of difficult wounds. Some trial work has also shown that the use of pentoxyfilline may decrease pain associated with poor perfusion of wounds.6,7 In dogs pentoxyfilline has been used to enhance healing and improve microcirculation.8 Other listed uses are vasculitis, vasospasms and contact dermatitis.9

Meloxicam was discontinued when pentoxyfilline was started as there may be an increased risk of bleeding when used with NSAIDs.10

Wound Management

Day 1. (Day of debriding)

Immediately after debriding, Medihoney® was applied to keep the wound moist and a tie down bandage was applied using a good granulation bed was present with a visible gap. Medihoney®, again while we waited for hydrocolloid supplies to arrive. This style of bandage allowed free movement of the limb but was messy as excessive exudate and honey leaked through the secondary and tertiary layers very rapidly. The dog did not tolerate this well and continued use of this bandage type would have required 2 or 3 bandage changes per day.

Day 3. For the first application of hydrocolloid we used Restore Plus dressing (Hollister®). This product did not adhere well to the dog’s skin. To achieve the air tight seal we needed, overlapping layers were applied allowing the product to adhere to itself. The product was also a little too thick to be easily moulded to the shape of the leg. This may not have been a problem in a larger dog. SoftBan® synthetic orthopaedic padding was used as a secondary layer to provide padding that would both help immobilise the limb and provide absorption for any excess exudate. Elastic® was used as a tertiary layer and extended up over the lip in a spica splint type pattern to reduce slippage. This bandage was left in place for 5 days.

Day 8. A good granulation bed was present with a visible gap between the deep and superficial digital flexor tendons.

Histopathology

A biopsy was taken from 2 areas at the margin of normal and abnormal tissues during debriding. Histopathology results

Figure 1. Necrotic skin caudomedial thigh and medial aspect of hindleg.

The decision was made to aggressively debride under general anesthesia and manage the resulting wound using moist wound healing techniques. Moist wound healing creates optimal conditions for faster wound healing.1 Wound fluid contains proteases, protease inhibitors, growth factors and cytokines in the appropriate physiologic ratios for each stage of healing.2 By using a moisture retentive dressing to retain this fluid in the wound, cell proliferation and function are enhanced.3

Water loss through intact skin is 4 to 9 g/m²/hr and increases to 80 to 90 g/m²/hr in partial and full thickness wounds.4 The occlusiveness of wound dressings is measured by moisture vapour transmission rate (MVTR).5 Dressings with a MVTR less than 35 g/m²/hr are considered moisture retentive.6 The closer the MVTr of the dressing is to the transdermal water loss of intact skin, the greater the likelihood of a positive wound healing outcome.7 Hydrocolloids have an average MVTR of 11.2 g/m²/hr.

Moisture retentive dressings have been shown to:8

- Encourage white blood cells to remain in the wound where they perform selective autolytic debridement of necrotic tissues.
- Maintain physiological temperatures which support protease, growth factor and cell function.
- Be more comfortable than non-occlusive dressings
- Prevent entry of unsterile dressings
- Allow longer intervals between bandage changes and faster healing
- Reduce scarring
- Reduce the incidence of infection by: Preventing tissue desiccation and necrosis
- Increasing the viability of white blood cells and their enzymes
- Maintaining a low oxygen tension which: Deters bacterial growth
- Attracts white blood cells
- Favours collagen synthesis and angiogenesis

Figure 2 A-D. After debriding.

Figure 3A. Restore Plus - medial aspect & Figure 3B. Restore plus - lateral aspect.

Back to TOC page
The author was concerned that granulation may not occur across this gap so packed the area with Restore Calcareous Alginate (Hollister). Intrasect hydrogel (Smith and Nephew)® wound dressing was applied over this to hold it in place. Restore Plus (Hollister)® was then applied with the same secondary and tertiary layers as previously.

in humans. This product adhered to the peri-wound skin better than the Restore® had and was easier to mould to the shape of the leg but was still relatively thick.

Day 27. This bandage change we started to use Comfeel Plus strips (Coloplast®). These are thin transparent hydrocolloid sheets that conform very well to the shape of the leg and adhered well to the skin. This product was the easiest of the hydrocolloids to use. After several bandage changes the dog seemed to develop a hypersensitivity to the product when it adhered well to the skin. By using the Adapt barrier seal® on the wound margin and applying the Comfeel Plus strips (Coloplast®) onto this we were able to minimise inflammation.

Figure 4. First bandage change.

Day 36. By this stage we felt we had sufficient contracture to be able to perform a mesh graft. The donor site was planned by cutting a template in the shape of the wound and mapping this to the skin of the lateral thorax and neck in 2 pieces.

The recipient site was prepared 24 hours before planned surgery by cleaning and clipping the peri-wound skin to remove adhesive residue. The granulation bed was lightly flushed with sterile saline and the epithelialised margins were debrided. A thin layer of silver sulfadiazine ointment was applied and Atrauman® (Kartmann®) dressing applied over this. The product information sheet states that Atrauman® is a fine weave hydrophobic dressing that has low adherent properties. Exudate is able to easily move through it but the fine weave prevents new tissue from growing into the weave thus reducing the risk of maceration. Atrauman® is also available in a silver impregnated form which could have been used here in place of the silver sulfadiazine cream. Conforming bandage was used to hold this in place, with Profore® and Elasticon® completing the bandage.

Day 44. The bandage was left in place for 7 days in order to leave the graft undisturbed as long as possible while staying within the period of antimicrobial effectiveness of the Kendall™ AMD dressing. The dog was sedated with Medetomidine 0.01mg/kg IV and Butorphanol 0.1mg/kg IV to prevent movement during the bandage change. Care was taken to ensure the dressing had not adhered to the graft before lifting.

Figure 5. Hock region at first bandage change.

Figure 6. Proximal wound - contraction and desiccation.

Figure 7. Hock showing active granulation.

Figure 8A & B. Comfeel Plus® strips applied.

Figure 9. Mesh grafts applied.

Day 12. Obvious contraction of the proximal end of the wound had occurred. The dog had been chewing at the top of the bandage resulting in removal of some of the hydrocolloid in this area. This had led to the proximal end of the wound drying out. In contrast the distal end of the wound was granulating well and had become very vascular. The alginate dressing was removed revealing that the area between the superficial and deep digital flexor tendons had closed.

As the hydrocolloid dressing absorbed exudate and the gel in contact with the wound liquified, it produced an odour which was intolerable to the owner. This odour was characteristic of many hydrocolloid dressings and not indicative of infection. In order to maintain compliance we changed to a Coloplast® product similar to the Restore® which had been found by the nurses advising us to have less odour associated with its use.
The margins of the graft were necrotic. The majority of the graft skin was a similar colour to the rest of the dog’s skin suggesting good survival of the graft. The bandage was replaced using the same materials and left in place for another 5 days.

Figures 11A-C. 13 days post graft.

Mepilex border® was placed over the caudal stifle where some breakdown of the graft had occurred and there was still moderate exudation. Atrauman® was placed over the rest of the healing graft and conforming bandage used to hold this in place. A Relevo absorbent pad® was applied over this followed by Profore® and Elasticon®.

Figure 12. Mepilex Border and Relevo.

Day 51. 17 days post graft there was only a small wound remaining at the caudal stifle. This was covered with Mepilex border®. In this high movement area the Mepilex border® did not adhere as well as it had on the thorax. A layer of Elasticon® was applied to keep it in place. At this point we also gave the dog more freedom to move around.

Day 57. We encountered problems with breakdown of the caudal stifle wound and necrosis of newly epithelialised areas at the proximal tibia. The caudal stifle area was heavily exuding and became infected. This was addressed initially by suturing KendallTM AMD® dressing over the area and restarting Amoxicillin/clavulanic acid 20mg/kg q 12hr. Exudate was absorbed and trapped well by the Kendall™ AMD® dressing.

Figures 11A-C. Overall graft ‘take’ appeared to be very good.

Sutures were removed 14 days later and the remaining wound continued to be bandaged every 48 hours with Adapt Powder®, Relevo absorbent pad® and Hypafix®.

Figure 13B & c. Kendall amD in use.

Once the exudation was under control we started using Comfeel Plus® strips again. We continued to have problems with breakdown at the proximal tibia and caudal thigh and appeared to be making no progress with the caudal stifle. It became evident that there was a draining tract preventing healing. This was packed with Restore Calicicare Alginate (Hollister)® to absorb exudate within the tract. Adapt Powder® (Hollister), a hydrocolloid powder, was applied over the wound. The caudal thigh wound was closed with 3/0 premilene in a horizontal mattress pattern. relevo absorbent pad® was applied over this and held on with Hypafix® (Smith & Nephew), a hypoallergenic self adhesive fabric sheet. This allowed the dog to have reasonable mobility despite being bandaged.

Figure 13A. Kendall AMD in use.

Figures 14A-B. Draining tract management.

Day 49. 13 days post grafting, the sutures were removed.

Figure 14B-C. Draining tract management.

Figures 11a-B Overall graft ‘take’ appeared to be very good.

Day 49, 13 days post grafting, the sutures were removed.

Figures 11a-c. 13 days post graft.

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Figures 14A-B. Draining tract management.

Sutures were removed 14 days later and the remaining wound continued to be bandaged every 48 hours with Adapt Powder®, Relevo absorbent pad® and Hypafix®.

Figure 15. At suture removal.
Although there are differences in the way humans and dogs heal,1 the help of the human medical field in resolving difficult cases like this can be invaluable. The owner was fortunate to have a member of his family experienced in stomacare and human wound management available to work with the vets involved in this case and also able to access the various products used. All dressings tried worked well when used in the appropriate setting. Hydrocolloids are best in low to moderately exuding wounds, while the foam dressing was best applied when the wound was exuding heavily. Overall the authors found the Comfeel Plus® strips the easiest to use. This product has been shown to enhance the rate of epithelialisation and granulation tissue morphology when used in first intention healing surgical wounds in dogs.11 The dressing is flexible and adhered well. The authors have been told by their human nurse contacts that skin irritation is sometimes seen in human patients when the product is used over several weeks. The authors experienced this problem in this patient but were able to manage it using Adapt barrier seal® as a protective layer between the skin and the dressing. The Kendall™ AMD® dressing is very soft and worked well in protecting the mesh graft while absorbing exudate from under the graft. It did not adhere to the graft and was easily removed without disturbing the graft. Slurting the dressing to the peri wound skin helped prevent movement of the dressing while secondary layers of the bandage were applied. In retrospect, if the authors had used the Adapt Powder® earlier in the management of the post graft wound breakdown, resolution of this wound may have occurred sooner. Although the Comfeel Plus® was maintaining a good granulation bed, the secondary dressings used to cover it were causing maceration at the margins. Comfeel Plus® does not necessarily require a secondary dressing, however these layers were used here to prevent the dog from removing the hydrocolloid dressing. Use of an Elizabethan collar had proven futile as he learnt to get around it or get it off. The Adapt Powder®, relevo absorbent pad® and Hypafix® combination was well tolerated and allowed us to minimise the size and thickness of the dressing. This in turn gave the dog increased mobility and appeared to improve his overall demeanor. Adhesive removal wipes were also used when removing adherent bandages from the skin. These appeared to significantly reduce the discomfort normally seen with removal of adhesive bandages.

Acknowledgements. The authors would like to thank the vets who provided advice on the Veterinary Information Network message boards and the many anonymous donors of bandaging materials and wound dressings used during the treatment of this patient.

References.
Canine Parvovirus: The most serious and deadly viral disease affecting dogs in Australia

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technical@virbac.com.au

Australia’s national pet disease surveillance system

www.diseasewatchdog.org

Passionate about animal health

The Facts

- Over one thousand Parvovirus cases are recorded annually with nearly 50% mortality1,2,3.
- Subclinical carriage occurring in 80% of cases4.
- New strains can now cross species5.
- Regions that have been Parvovirus-free are now reporting cases.
- Strong herd immunity is vital to ensure populations remain safe.

3 Disease WatchDog data, www.diseasewatchdog.org downloaded 21-1-2013
5 Haynes SM, Holloway SA. Identification of parvovirus in the bone marrow of eight cats. AVJ 90(4): 136-139