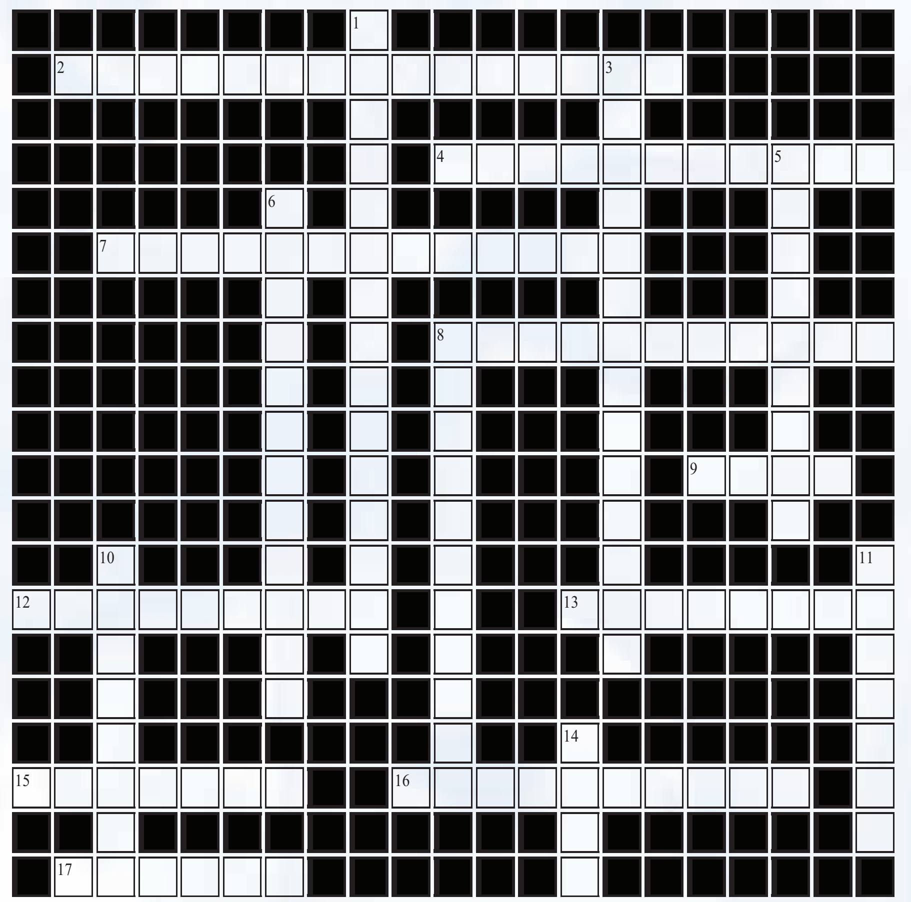
Surgery Crossword - by Mike King



Across

2. Subcutaneous "twitch" muscle of the thoracic region (9,6)
4. Tumour of these cells are the most common neoplasia of undescended testicles, frequently causing signs of feminization (7,4)
7. Commonly used antibacterial scrub solution that binds to keratin, providing a residual activity (13)
8. Common Penicillin-type oral antimicrobial, often combined with Clavulanic acid (11)
9. Malformation of this bony protuberance can result in atlanto-axial subluxation in some toy-breed dogs (4)
12. Direction of most stomach torsions in a GDV (9)
13. Loop of suture material tied around a vessel or pedicle of tissue (8)
15. Region of the bladder where the ureters enter (7)
16. Scientific term for a lesion of the spinal cord (10)
17. Histological tissue layer present throughout the gastrointestinal tract, but absent in the oesophagus (6)

Down

1. Hole in the cortex of the bone through which blood vessels pass (8,7)
3. Presence or formation of gallstones (14)
5. Prognosis following amputation for treatment of a feline osteosarcoma (9)
6. Group of non-colloidal IV fluids that includes saline and Lactated Ringers Solution (12)
8. Minimally invasive surgery using a small camera to evaluate a joint (11)
10. Pure mu receptor agonist opioid with an approximate 4-6 hour duration of action (8)
11. This nerve innervates the quadriceps muscle group (7)
14. Number of sesamoid bones associated with the canine stifle (4)

Please fax, email or post your answers to VSG® by 30 April and ensure you include your name and clinic. All correct answers go into the draw for a book by Dr. Terry Fossum, or a bottle of Dom Perignon. Congratulations to Dr Brendan Gammeter of Paraparaumu Veterinary Centre, who won the prize for the Imaging Crossword in our October newsletter. Brendan won the book *"Handbook of Small Animal Radiological Differential Diagnosis"* by Kirberger, Wrigley & Barr.

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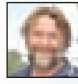

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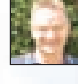

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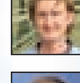

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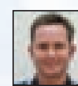

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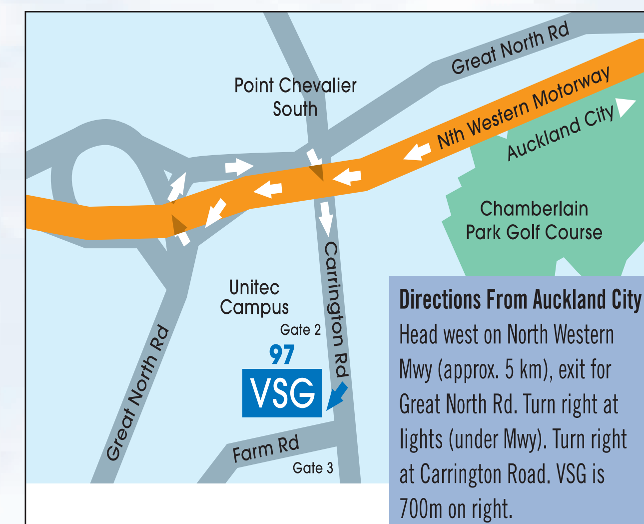
The Veterinary Specialist Group hospital is located on the Unitec campus situated between Gates 2 and 3 on Carrington Road.



Issue 16. April 2010

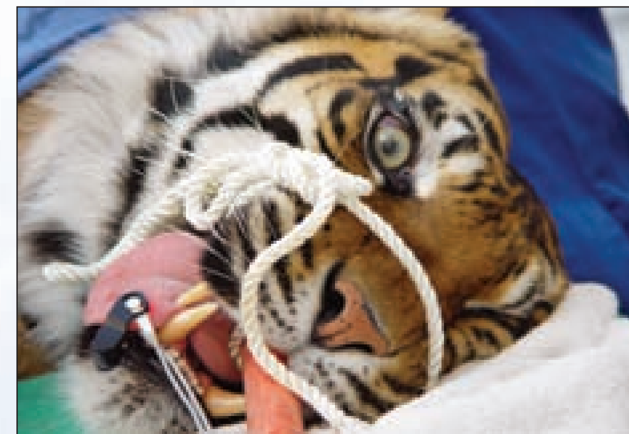
The Next Step

E X P E R T I S E • T E C H N O L O G Y • C O M P A S S I O N

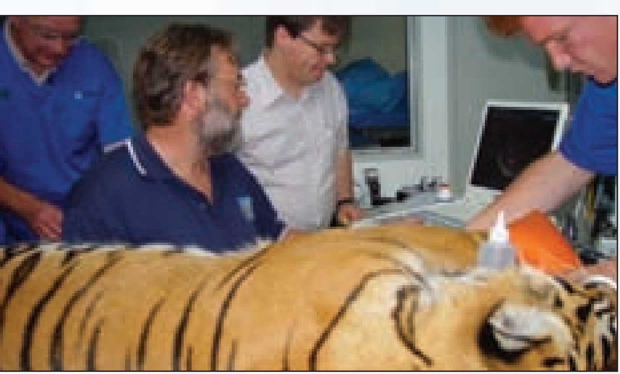
Fun with Molek the Tiger at Auckland Zoo - by Mike Coleman

Molek is a 10-year-old female Sumatran Tiger, so named as they are only found on the Indonesian island of Sumatra. There are an estimated 500 Sumatran tigers left in the wild – they are endangered as a result of deforestation for palm oil as well as poachers. Molek is part of a captive breeding programme at Auckland Zoo and her three cubs born there are well known by the general public.

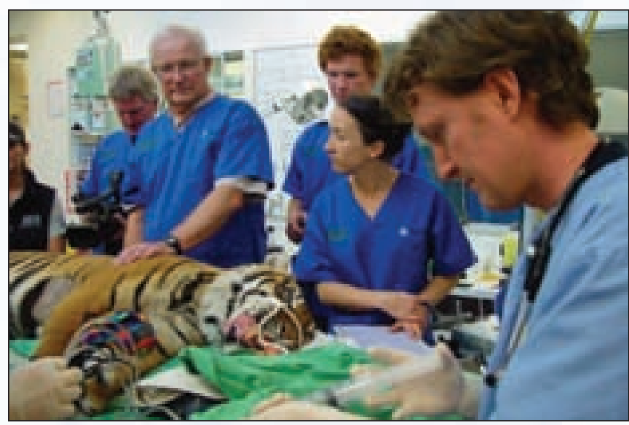
Molek's keepers became concerned when she started showing signs of increased respiratory rate and effort, particularly after exercise. As she was due to be anaesthetised for some routine health work, radiology specialist Dr Chris Warman and medicine specialist Dr Mike Coleman were asked to perform further diagnostic procedures to investigate her 'exercise intolerance'.



Molek is a truly magnificent animal, even more so when you get as close to her as we did. An echocardiogram was performed by Chris Warman. This showed no evidence of underlying heart disease. Radiographs of the lungs were also unremarkable. A bronchoalveolar lavage (BAL) was performed by Mike Coleman. (For the non-veterinarian this is a procedure where a long tube is placed down into the lungs. Sterile saline is injected and cells are collected in the saline for analysis). Results showed increased numbers of inflammatory cells in the lungs. It is likely that Molek has chronic bronchitis – inflamed airways as a result of allergens or pollutants in the air.



Fortunately Molek has stopped showing signs of exercise intolerance without any treatment. We are using inhaled human asthma medications a lot for this problem in domestic cats – this would obviously not be possible in a tiger!



Intern Goes to Boston

The partners and staff of VSG® are pleased to announce that Dr. Elyshia Hankin, the 2009 VSG®-Pfizer intern, has successfully obtained a diagnostic imaging residency at Tufts University in Boston, Massachusetts. The residency, which is a three year program commencing in July 2010, gives her the opportunity to study for, and achieve Diplomate status in the American College of Veterinary Radiology. Elyshia will join the Tufts radiology department, which currently includes Dr. James Sutherland-Smith, the first VSG®-Pfizer intern. We wish Elyshia well in her endeavours.

Dr. Elyshia Hankin

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The Pfizer Internship at Veterinary Specialist Group

VSG® in conjunction with Pfizer New Zealand are pleased to welcome Dr. Tom McNaughton as the 2010 Pfizer Intern at VSG®.

Tom is an Aucklander who enjoys racquet sports. Tom completed his veterinary degree at Massey University in 2009. Following the completion of his twelve-month internship, he hopes to pursue further clinical specialist training through the North American or European residency program system. The Pfizer Internship is offered to new graduates of Massey University annually and is a fixed twelve-month position from December to December of the following year. The position offers concentrated, supervised, in-hospital training through services in small animal surgery, internal medicine and diagnostic imaging. Pfizer New Zealand has been a key contributor to the success of the programme.

The objectives of the programme are:

1. To prepare the intern for postgraduate specialist training (internship, residency, research) at university teaching hospitals overseas.
2. To provide the intern with an opportunity to develop an understanding of the clinical management of challenging small animal medicine and surgery cases.
3. To allow the intern to learn professional publication and presentation skills.
4. To provide the intern an opportunity to develop skills in client communication, medical record keeping, and literature review.

The intern has no primary case responsibility but works alongside the specialist during the admission of complex cases referred to the Veterinary Specialist Group hospital. During the year, the intern will develop the clinical skills required to assess, diagnose, and treat these patients with the opportunity to refine fundamental skills including catheter placement, blood collection, fluid therapy, anaesthesia management, analgesia, transfusion medicine, and the acquiring and interpretation of imaging studies and clinical pathology.

If an animal proceeds to surgery, the intern is scrubbed in as surgical assistant, getting first-hand experience of general surgical principles and specific techniques. The monitoring, management, and care of hospitalised patients are a major part of the intern's duties that extend to weekends and after hours.

Dr. Tom McNaughton

Holly's Spark Returns - by Jane Finlayson, Backbone Marketing Ltd

Like many pet owners Jane Bebbington and Robyn Beckerleg believe that when you have a pet then you have a responsibility to do the best for it and Holly has certainly tested that commitment over the last couple of years.

Jane and Robyn say Holly is a real cutie. The outgoing, loving Wirehaired German Pointer has been part of the family for 8 years and during that time she has had a few challenges, needing TPLO surgery on both knees in 2008.

So when Holly started to get lame again Jane, after consulting their local vet at Lynfield Veterinary Clinic, didn't hesitate taking her back to Alex Walker at VSG®, who by now knew Jane, Robyn and Holly quite well. Initially Alex suggested medical therapy for Holly but when that didn't work further investigation was carried out.

Holly was diagnosed with discospondylitis and Jane and Robyn, both nurses, wanted to be sure that they made informed decisions especially, since Holly had already undergone several operations. "We preferred that she was treated conservatively. However she was in a great deal of pain and going downhill so we put our faith in Alex."

They weren't disappointed, "Alex was wonderful and did an immense amount of research to reassure us that surgery was going to be the answer for Holly. Being nurses we were a little suspicious that surgeons may only look to surgery for the answers but that was not how Alex approached the problem. We really believe that he only advocated what was in the best interests of Holly."

Jane recalls the day of Holly's surgery clearly, "Alex rang me himself straight after the surgery and told me it had gone really well. Not long after that the nurses rang all excited because she had stretched out – something she'd not been able to do for some time – it was like a miracle."

Jane and Robyn say that VSG® staff have been amazing. "Everyone you deal with have genuine concern for what's happening to you and your pet and they keep you well informed which is really important."

"Holly came off medication on Christmas Eve and is now walking up to 1km, three times a day so we are both delighted with her progress. It's been a huge labour of love for us as there was a lot of recuperation involved, however to see her pain free, wagging her tail and with the spark back in her eyes has made it all worth it."

Holly

Holly - by Alex Walker

Holly is an 8 year old female German Wirehaired Pointer who had bilateral TPLO's performed in early 2008. She had a good recovery and returned to normal activity. In September 2009 she was presented for an intermittent lameness in the left hind leg. On clinical examination no pain or effusion could be found in the stifle and radiographs showed a stable implant. The plate was removed and the medial meniscus was found to have a caudal pole injury. A partial meniscectomy was performed. Holly started to improve but presented three weeks later with progressive lameness in the left hind leg. On examination there was no pain in the stifle but some lumbosacral (LS) pain and superficial pain over the gluteal region was present. Rectal temperature was normal. Differential diagnoses included; degenerative LS stenosis, infection, neoplasia and Type 2 intervertebral disc rupture. Radiographs of the LS space were read as normal although there was a questionable loss of vertebral endplate bone in one ventral dorsal view but not another. This finding made me suspicious of discospondylitis. A computed tomography (CT) confirmed extensive lysis of the L7-S1 vertebral endplates typical of discospondylitis. (See image 1). The LS disc space was aspirated under fluoroscopy and samples of blood and urine collected for culture and sensitivities. We got a positive culture of *Serratia species* from the intervertebral disc aspirate, sensitive only to trimethoprim/sulfa (oral) and gentamicin.

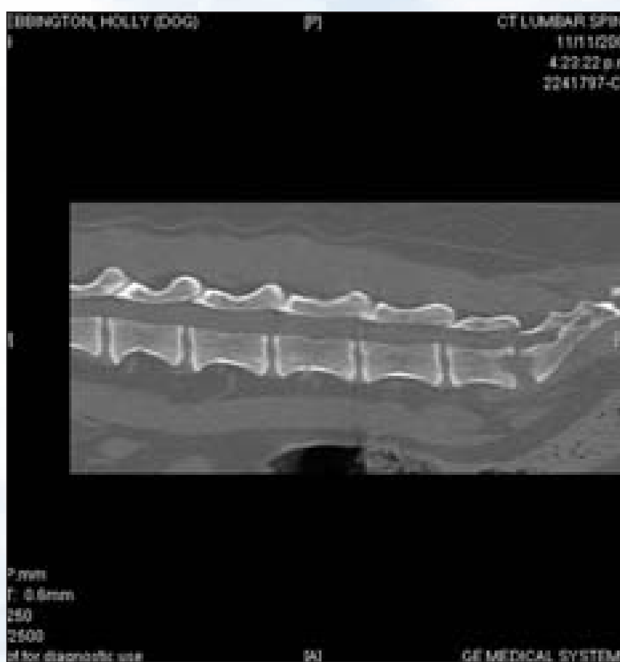

Image 1. *CT showing bony lysis of the L7-S1 endplates.*

Holly continued to clinically deteriorate with intense lumbosacral pain and cauda equina dysfunction (weakness and paresis) and loss of tail movement. She failed to respond to antibiotic therapy and cage rest with analgesia (fentanyl constant rate infusion followed by fentanyl patches, Rimadyl and gabapentin). After one week of medical therapy, surgery was undertaken to curette the infected disc space, pack with cancellous bone graft from the ilium, and stabilise with transfacet screws and segmental spinal instrumentation (a technique using Steinmann pins driven into the ilial wings and attached to the dorsal spinous processes and articular facets with wires [see image 2]). I wanted to avoid the use of polymethylmethacrylate in an infected site. Tissue from the L7-S1 disc space was submitted for culture. The culture was negative indicating that the clinical signs were due to instability and compression of the L7 nerve roots. Holly immediately improved post-operatively with a reduced level of pain. Function has gradually returned to her hindlegs and tail and she is fully ambulatory and pain free.

Follow-up films at six weeks showed progressive bony fusion of the L7-S1 space. Antibiotics were continued for six weeks post-operatively. Interestingly, Holly developed left facial nerve paralysis five weeks post-operatively with loss of palpebral function. A diagnosis of idiopathic facial paralysis was made. The prognosis for full return of facial nerve function is guarded. I wait with trepidation for Holly's next trick.

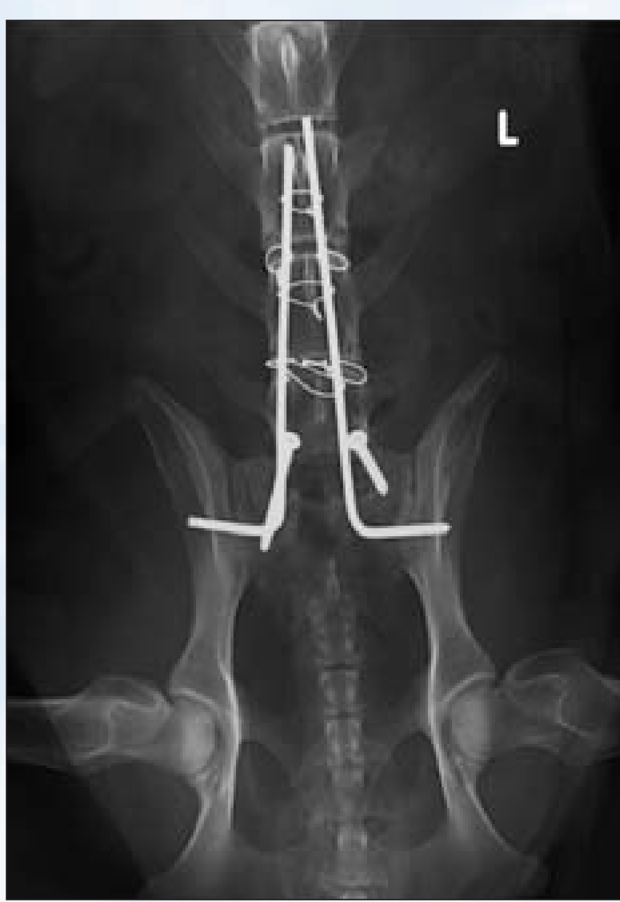

Image 2. *Stabilisation with transfacet screws and segmental spinal instrumentation.*

Hypoadrenocorticism: The Great Pretender - by Danielle Bowles

Hypoadrenocorticism, or Addison's disease, is sometimes called the great pretender, and this moniker has never rung more true than with Judd McGuire, a 9-year-old male neutered Mastiff cross who was referred to the medicine department at VSG® for further evaluation of progressive neurological disease.

Judd presented with a one month history of progressive exercise intolerance. One week prior to presentation Stuart and Michelle had noticed Judd developing ataxia and weakness. He deteriorated rapidly over the weekend with severe lethargy, unwillingness to stand and altered mentation. On examination he was exhibiting central neurological signs such as altered mentation, circling and head pressing. He appeared weak when he attempted to stand.

The possible causes of Judd's clinical signs and differentiating between intracranial disease and extracranial disease were discussed with the McGuire's and they consented to performing an extracranial disease work up prior to considering advanced imaging (MRI). Blood tests showed a mild non-regenerative anaemia and mild hyponatraemia. A sodium potassium ratio was less than 27, suspicious for hypoadrenocorticism. A mild azotemia, hypoglycaemia and hypoalbuminaemia were noted. A random cortisol test returned at 7mmol/l, below the cut off level to rule out hypoadrenocorticism. A bile acid panel returned within normal limits. Chest radiographs showed 'old dog lung' changes. An abdominal ultrasound showed altered renal and splenic parenchyma. A full ACTH stimulation test was recommended prior to evaluating the renal and splenic parenchyma. A post ACTH cortisol level returned <5mmol/l, consistent with hypoadrenocorticism. Judd was started on 0.9% sodium chloride and was administered dexamethasone and was started on prednisone and fludrocortisone. He became brighter and more interactive soon after treatment was initiated and by discharge was eating, bright, walking normally and was improving day by day.

Judd returned one week after discharge for an electrolyte and renal evaluation. He was almost back to normal behaviour and was tolerating the steroid treatment well. His electrolytes and renal values were back to normal. One month later Judd showed no progression of the ultrasonographic changes. He has returned to his regular clinic for further monitoring and care.

Clinicians need to have a high index of suspicion for Addison's disease, as not all dogs present collapsed and in shock. Looking for subtle biochemistry abnormalities in any unwell dog should prompt a clinician to perform at least a random cortisol level to rule out, or heighten their suspicion for the disease. Judd will hopefully continue to respond well to treatment and continue to enjoy life.

Good Save For Judd - by Jane Finlayson, Backbone Marketing Ltd

For Stuart McGuire and his partner Michelle, Judd is like a surrogate child. Stuart had wanted a dog all his life and took on Judd as a six week old puppy.

Judd is a 9 year old Bull Mastiff cross who Stuart describes as a bit of a softie: "He's a bit like Scooby Doo really - he dances around with splayed legs half the time and is really people orientated. He's a typical Mastiff - he leans on things and people all the time and has to sniff everything."

Judd is usually walked daily and usually bounds on ahead fossicking for interesting smells, but Stuart had noticed Judd was slowing down. "Initially I thought that is was just old age until it got to the stage that he lagged along behind me until his legs just gave out altogether."

His local vets, Sylvia Bell and Craig Hunger at Papatoetoe East, know Judd well; "Initially we thought that it was his arthritis slowing him down but he didn't respond as expected to the usual pain relief." Instead, Judd became increasingly whimpery and reluctant to move. Further investigations didn't reveal the cause of Judd's distress. Over one weekend Judd's signs had got even worse: he was dull, not eating and staggering. With the increasing severity and number of symptoms Craig recommended referral to VSG® and transfer to AEC to continue intensive care over the weekend until he could be assessed by the specialist.

On the Monday morning Judd was seen by Danielle Bowles. Stuart recalls, "The whole VSG® experience was great, everything was so well organised and Danielle was absolutely excellent and really knew her stuff."

Judd was not a typical candidate for Addison's disease and the eventual diagnosis was a relief to Stuart and Michelle. "Once he was put on the medications we saw a marked improvement - now he's got more energy than he'd had for quite some time."

Stuart is quick to thank everyone involved in Judd's care, "Whilst it has been a difficult experience for us and Judd, everyone has done everything that they could for him - Sylvia and Craig at our local vet did a great job and their recommendation to refer Judd to VSG® was definitely the right one."

"It was definitely a good save by Danielle as it was not an easy diagnosis," says Stuart. "We are thankful that VSG® and their specialists are available here in Auckland - in the past Judd may have been put down but now we (and our local vets) have options. Obviously we're really delighted to still have Judd with us."

Judd

Imaging an Icon - by Chris Warman

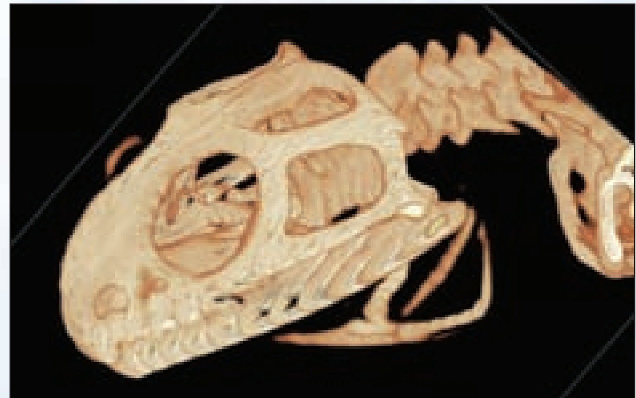

Figure 1. *A computed tomography 3-D reconstruction of the tuatara skull and spine.*

In over 30 years in the field of diagnostic imaging, I have been involved in the diagnostic imaging of many of the creatures that inhabit our planet. The list includes from humble mouse, to the largest terrestrial mammal, the elephant. The list is nowhere near as comprehensive as that of veterinary radiologists working in environments where there are greater numbers of exotic animals kept either as pets, or in zoological parks, or maintained in managed wildlife programs, such as those in Africa, Asia, the USA or Europe, but given the practice's proximity to the Auckland Zoological Park, we are asked to image some unusual creatures.

Performing diagnostic imaging for the zoo can present some unusual challenges. Unlike my day-to-day work it is not easy to reach to the bookshelf to query a questionable piece of anatomy, or to review images of a specific finding of radiographic pathology. At these times, one has to thank the Internet and certainly the collective networking of zoo veterinarians throughout the world, for providing valuable information which can advance the diagnostic imaging process. At other times, even the above sources of information can be of limited value and one has to fall back on aspects of both comparative anatomy and pathology. The imaging of a clinically unaffected member of the same species can also provide for valuable insight, if such a patient is at hand. All these resources need to be utilized when one is presented with the clinical disease entity in a quintessentially New Zealand creature, such as the tuatara. So when Dr. John Potter, from the Auckland Zoological Park, rang to ask whether I could perform a CT scan on a tuatara with vestibular disease, I was aware we would face some challenges. Given the uniqueness of this creature, there is relatively limited readily available information on its anatomy and physiology. Even less information is available on known disease entities in the tuatara. Wikipedia and the University of Wellington provided some excellent information. A site in Texas also provided some excellent 3-D computed tomography images of the skull.

On the day of the imaging, we imaged both the affected patient and a healthy, smaller tuatara, using a GE 64 slice CT. Both of the patients were imaged sitting in a glass aquarium, with both staying immobile for the 8 second imaging sequence, therefore eliminating the need for any form of anaesthesia. The images of the affected patient were somewhat rotated as a result of its disease entity, but it was possible to reconstruct the acquired images into standard planes of imaging, with CT diagnostic imaging software. In addition to the multiplanar reconstructed images, multiple 3-D constructions were also performed.

Unfortunately the study failed to reveal any significant pathology and a tentative diagnosis of an inflammatory vestibular disease was made on the basis of the clinical signs. Subsequently on post-mortem, a fungal agent was identified, which had resulted in a systemic infection, including both myelencephalitis and localized skull osteomyelitis.

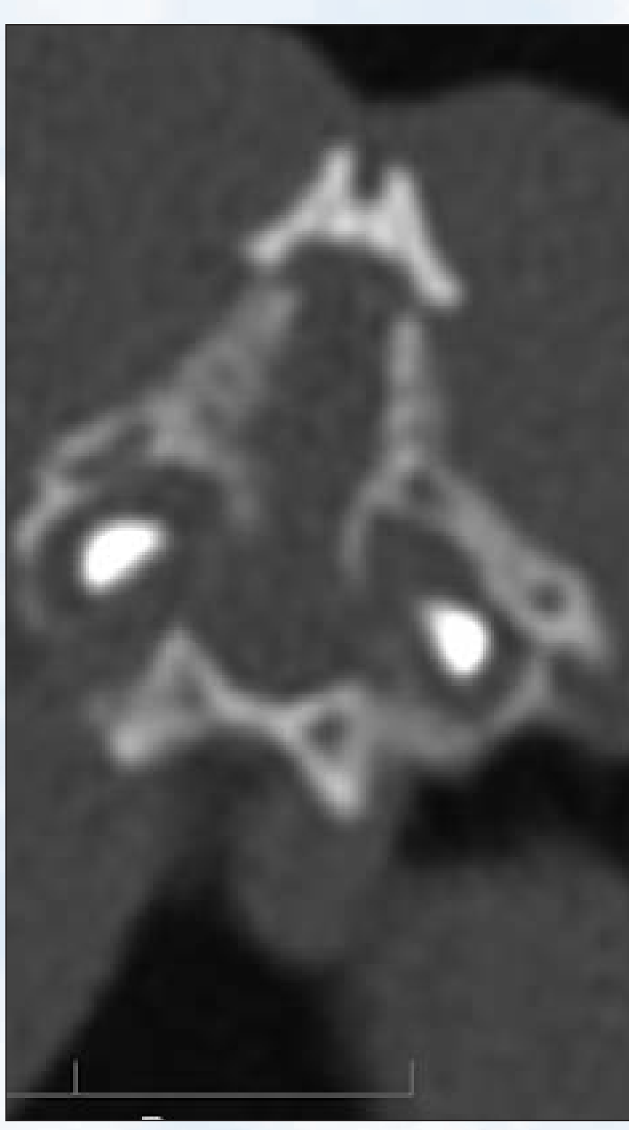

Figure 2. *An axial computed tomography image of the normal tuatara, revealing an intensely opaque stapes and a middle ear filled with adipose tissue.*

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