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The Next Step

Veterinary Specialist Group

EXPERTISE • TECHNOLOGY • COMPASSION

Meet the Medicine Team

Mike is a talented musician whose seemingly quiet demeanour hides a wicked sense of humour. He has recently jumped on the celebrity bandwagon by adopting a baby....except his wee girl is a super-cute ball of white and apricot fluff. She can often be seen curled up next to dad's desk, supervising his work.

Danielle is a classically trained pianist, and a woman of seemingly limitless patience (we are testing this, so stay tuned). She has pretty much given up trying to teach us how to speak Australian, but we still hold out hope she will learn how to say "fush and chups" one day.

Gidget is our import from the southern wilds of Dunedin; we figure the current frosty temperatures will make her feel right at home. Not content with the fluff factor provided by four! Persians she also has a large Malamute (of the non-hairless variety). Oh, and Gidget has access to a seemingly endless supply of chocolate, making her very popular on Friday afternoons!

Mark is taking a practical approach to his frequent trips around the country; he is planning to complete his flying lessons. No hints of a Robson Flying Veterinary service as yet, but watch this space.

Hannah-Jane is raising not only two sometimes-naughty cats, but also a lovely baby girl. Did I say "lovely"? Actually, she's gorgeous (not that we're biased or anything). HJ manages to make juggling mum-hood and fulltime work look like a breeze.

Fiona is an ace volunteer for the NZ Breakers, though she draws the line at cheerleading. She is a keen movie-goer, as well as an unofficial team librarian, introducing the rest of us to all sorts of books. She has a secret penchant for Newfoundlands, but we think the condition is curable.

Yiwen hails from Shanghai and makes a semi-annual trip back to keep an eye on the city's progress. She is sometimes pressed into service as a translator during consultations, and may soon need her own business card. Yiwen owns what is possibly the world's only non-overweight Labrador.

Lisa has recently ventured south to Christchurch. We miss her professionalism and sunny disposition (but not her grumpy cat) while wishing her all the best in her new endeavour.

Val (inset) has two furkids and, gasp, two teenagers (good luck with that!) yet still looks calm and collected at all times. She is a dynamic force in her local school district.

Shannon is from America by way of Canada, Aotearoa and Germany. It's not a good idea to ask her how to spell words like 'colour', and she sometimes has trouble writing the date (never mind the "fush und chups" thing). Lacking pets of her own she lives vicariously through her rent-a-kitty, Sam.

Mark, Shannon, Lisa, Danielle, Gidget, Fiona, Yiwen, Hannah-Jane, Mike, Val (inset)

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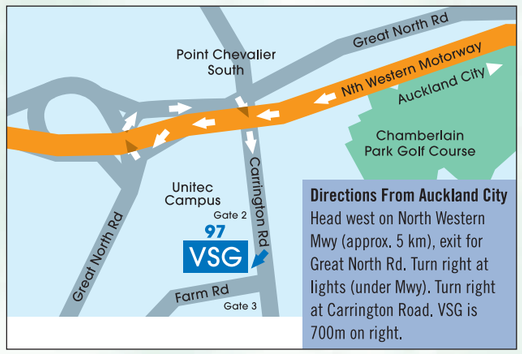
The Veterinary Specialist Group hospital is located on the Unitec campus situated between Gates 2 and 3 on Carrington Road.



Laparoscopic-assisted Gastropexy - by Alex Walker

Gastric dilatation volvulus (GDV) is a syndrome characterised by rapid expansion of the stomach with trapped gas, fluid and food with rotation of the stomach around its long axis. Open gastropexy has long been the gold standard treatment for GDV because of the high mortality and recurrence rates of this condition. Failure to perform a gastropexy at the time of GDV corrective surgery results in a 50-80% recurrence rate whereas gastropexy reduces this rate to 4-10%. Gastropexy can be used prophylactically in individuals thought to be at high risk, and one study has shown significant reduction in lifetime mortality associated with GDV in rottweilers and great danes. Most gastropexy techniques require an open surgical approach with significant morbidity resulting in infrequent use of this technique. Recent advances in minimally invasive surgery in veterinary medicine have resulted in development of laparoscopic, laparoscopic-assisted and endoscopic gastropexy techniques. Clinical reports indicate laparoscopic-assisted gastropexy creates a permanent, strong adhesion between stomach and body wall with minimal complications and effective prophylaxis against GDV.

This is a report of a clinically successful prophylactic laparoscopic-assisted gastropexy performed at VSG® on a 20 month old standard poodle. Two of the patient's litter mates had developed GDV within one month of each other requiring emergency surgery for surgical treatment and open incisional gastropexy. The patient was presented for prophylactic gastropexy because of his high risk.

The patient was prepared for abdominal surgery and placed in dorsal recumbency. A pneumoperitoneum was established using a mechanical insufflator with CO_2 passed through a Veress needle (blunt tipped, spring loaded needle) placed into the abdominal cavity. Insufflation allows the body wall to be separated from the internal organs minimising iatrogenic damage during placement of the trocars and laparoscope.

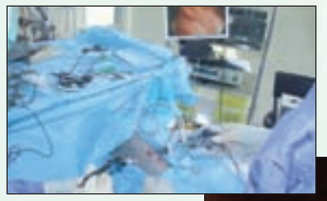


Image 1

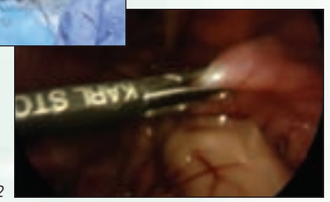


Image 2

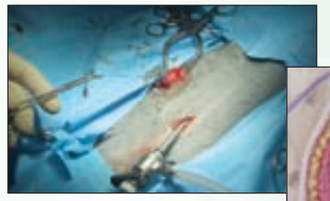


Image 3

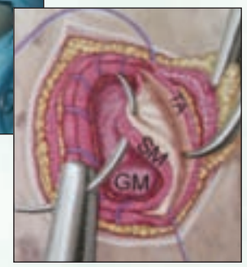


Image 4 - Artist: Clarence Rawlings

The intra-abdominal pressure measured by the insufflator should not exceed 10-15mm Hg while the trocars are placed. A zero degree 10mm scope was placed on midline just caudal to the umbilicus. The instrument port was placed just lateral to the right margin of the rectus abdominis about 3-5cm caudal to the last rib (see Image 1). A 10mm laparoscopic Babcock forcep was used to grasp the antrum of the stomach and draw it close to the abdominal wall (see Image 2). A full thickness incision (4cm) was made in the abdominal wall (grid pattern) at the site of the instrument port (from exterior to interior) and the antrum was exteriorised (see Image 3). In this case we exteriorised the proximal duodenum to perform a full thickness biopsy first. An incision was then made in the seromuscular layers of the antrum along the long axis of the stomach. The edges of this incision were sutured to the edges of the transversus abdominis muscle to create the gastropexy (see Image 4). The body wall was closed in layers. The pexy site was examined with the laparoscope (see Image 5) and the laparoscope was then removed and the small incision closed.

The patient recovered rapidly and was discharged the following day. We propose this technique allows effective prophylaxis for GDV in "at risk" patients with minimal morbidity (see Image 6).

Image 5

Image 6

St. Bernard Rescue Success - by Jane Finlayson

Diesel is a 5 year old St Bernard who lives on one hectare at Tuakau with his owners Jackie and Mark Martel, and Bart the Bull Mastiff.

Jackie says, "Diesel is an adorable dog but could be described as a little insecure. He just wants to be with me every minute of the day and is quite happy to sit and stare at me. It can be a bit disconcerting because he is so big."

Diesel is Jackie's second St Bernard, having lost her first during surgery for a heart condition at a similar age. Alarm bells started ringing late last year when Jackie noticed that Diesel was not eating much and was lethargic. She also noticed swelling around the abdomen so took him into Franklin Vets in Pukekohe. Veterinarian Melissa Alley saw Diesel and recommended that he go to a specialist ASAP because he was going to need specialist equipment and care.

By 10am the same morning Diesel saw medicine specialist Mike Coleman at VSG® who confirmed right sided heart failure due to pericardial effusion. There was fluid around the heart and he organized an ultrasound to assess the extent of the problem. Nine hundred ml of fluid was removed and Diesel was out of immediate danger. Mike advised that while there seemed to be no tumour there was a chance the condition would recur.

Jackie recalls that for three months over the Christmas period Diesel was great, however in February the swelling was back so they quickly headed back to VSG®.

On this visit they saw Mark Robson and fluid was drained for the second time. The Martels took Diesel home to consider the options presented to them. They knew they didn't want open chest surgery or to lose their precious pet.

Within weeks fluid was collecting again and it was obvious to Jackie and Mark that they needed to take preventative action.

"Mark Robson had previously mentioned thorascopic surgery as an alternative and we liked this option as there would be less trauma and faster recovery."

The surgery was scheduled making Diesel the second dog in New Zealand to undergo the procedure to remove part of the sac around his heart using the thorascopic technique. This allows the fluid to drain into the chest cavity where the lymphatic system can better cope with it.

"The VSG® team were absolutely fantastic," Jackie says, "Everyone, from the receptionists through to the specialists and nurses were very caring and explained everything so that we could understand it. We had every confidence that Diesel was in the best hands and they kept us well informed all the way through his surgery and recovery."

Jaqcui concludes, "He's running around like a normal dog now and watching him eat has made me realize that he had probably not been feeling well for quite a while. He's putting on weight and is over 70kg. He's still insecure though and continues to watch my every move. We are so grateful that the VSG® specialists are available with all their high tech equipment and experience to rescue our special gentle giant."

Pericardial Disease - A Diagnostic and Therapeutic Challenge - by Mark Robson

Before the advent of ultrasound in veterinary practice pericardial disease represented a very difficult diagnostic challenge in small animal medicine. Radiographs are relatively insensitive at differentiating cardiomegaly due to pericardial effusion from enlargement due to valvular or myocardial pathology.

Ultrasound has allowed us to make more diagnoses of pericardial disease and to make them earlier, allowing more chance for therapeutic intervention. However we are now faced with dogs and cats suffering from pericardial disease more often and we need to be aware of all the options for these pets. Even with ultrasound it can be extremely difficult to determine the precise underlying disease.

The pericardium is the fibro-serous envelope that completely surrounds the heart. It is continuous with the mesothelium of the pleura and blends into the adventitia surrounding the great vessels. It has 2 main layers; an outer fibrous pericardium and an inner serous layer. The serous layer is further subdivided into an outer parietal layer and an inner visceral layer which is also termed the epicardium. No-one is quite sure what the pericardium does! The most common explanation is that it provides a means of semi-rigidly enclosing the heart to allow the myocardium to "work against" and therefore more effectively contract.

In the normal animal there is only a potential space between the fibrous and serous layers of the pericardium. In a variety of disease syndromes this space becomes occupied by fluid, which may be blood, a transudate, modified transudate or exudate.

Heart failure can cause a transudate to accumulate inside the pericardium by the same mechanisms which cause pleural fluid to build up. Infectious diseases such as FIP and bacterial infection can result in an exudate. Neoplastic disease such as lymphoma and various heart-base tumours can cause fluid to arise, and this may be richly cellular (lymphoma) or haemorrhagic (hemangiosarcoma, mesothelioma). Fluid analysis should always be performed, but cytology of

Pericardial Disease - A Diagnostic and Therapeutic Challenge - contd

haemorrhagic effusions is usually unrewarding, even if the eventual diagnosis is one of neoplasia.

An intriguing number of dogs suffer from idiopathic pericardial effusion. In these cases we rarely find an underlying cause even at necropsy. This is why they are called idiopathic! The accumulated fluid is usually indistinguishable from blood and is believed to arise from damaged blood vessels in the pericardium or epicardium. The tissues often become inflamed as a result of persistent exposure to blood, and it is controversial as to whether the inflammation precedes and perhaps causes the effusion or whether the pericardial tissue only becomes inflamed once the blood is present.

The consequence of almost any pericardial disease is often right-sided heart failure (RSHF). The low-pressure right atrium is collapsed by the compressive effects of the effusion. Blood return to the heart from the cranial and caudal vena cava is reduced, and congestion of the liver and intestines leads to ascites, which can be very large-volume. Occasionally oedema of the head and neck can be seen.

On physical exam ascites may be noted, the heart sounds might seem muffled, and if the ventral neck is wetted down or clipped, abnormal jugular pulses extending far up the neck might be seen. These signs can also be seen with cardiac disease, but heart disease that is this severe usually (but not always) will result in left-sided failure too and coughing, dyspnoea and moist lung sounds will often be noted. Eventually of course even a largely right-sided phenomenon such as pericardial effusion will lead to left-sided failure as the blood flow from the right ventricle through the lungs to the left atrium drops below critical limits. Death is imminent at this point.

Medical treatment has proved to be frustratingly ineffective, even in idiopathic effusions. If you are stuck with a dog or cat dying of apparent pericardial effusion and you cannot obtain an ultrasound exam, you may be forced to try draining a pericardial sac "blindly". This is documented in most medical textbooks and although scary is not as hard as you might think. If the pet actually has severe dilated cardiomyopathy that is mimicking pericardial effusion on radiographs, then you probably haven't got much to lose if you feel that the animal is dying anyway. If pericardial effusion is present then you will be a life-saver.

There are a couple of subtle points when evaluating pericardial disease. Firstly, fluid can accumulate for a considerable period of time before clinical signs seem to suddenly occur. This is because the pericardium will progressively stretch (similar to the left atrium in mitral valve disease) to accommodate the fluid until its elastic limit is reached and it can stretch no more. At this point if fluid accumulation continues then the pressure will suddenly rise and the patient will become acutely symptomatic.

Secondly, even "benign" pericardial effusions that we term idiopathic become life threatening if they recur. The persistent presence of fluid induces inflammatory and fibrotic changes in the pericardium so that its compliance reduces. These sacs often look and feel thickened and leathery. This will mean that a much lower volume of fluid is needed before RSHF ensues, and can mean that the periods of time between episodes of collapse becomes shorter and shorter.

In the case of Diesel, we believe his disease to have been idiopathic. At no stage through repeated ultrasound exams over 6 months has there been conclusive evidence of a mass, and the pericardial tissue eventually submitted for histopathology showed only chronic inflammatory and fibrotic change. Diesel's first attack was treated conservatively with ultrasound-guided drainage, and he was apparently normal for a few months, then the second drainage produced only a few weeks of respite. At the next presentation it was then a case of "three strikes and out" so intervention became essential. As his owners were strongly against the idea of thoracotomy, he was a perfect candidate for thorascopic partial pericardectomy.

Of course the process which has resulted in blood accumulation in his pericardium has not been stopped. The assumption is that the fluid will drain into his massive pleural space and be absorbed by the extensive lymphatic system in that cavity. Complications of fluid accumulation in the pleural space can occur, but are uncommon.

Canine Thoracoscopy - by Richard Jerram

The use of a thoracoscope to diagnose and treat diseases of the thorax is not a new concept in veterinary medicine, and its impact is certainly growing, particularly among referral veterinary practices. I used thoracoscopy in the late 1990's as part of my residency research project at Texas A&M University, but we (VSG®) have only recently obtained the equipment to be able to use thoracoscopy more frequently in our patients. The technique requires specific and not inexpensive equipment as well as a considerable amount of experience and patience.

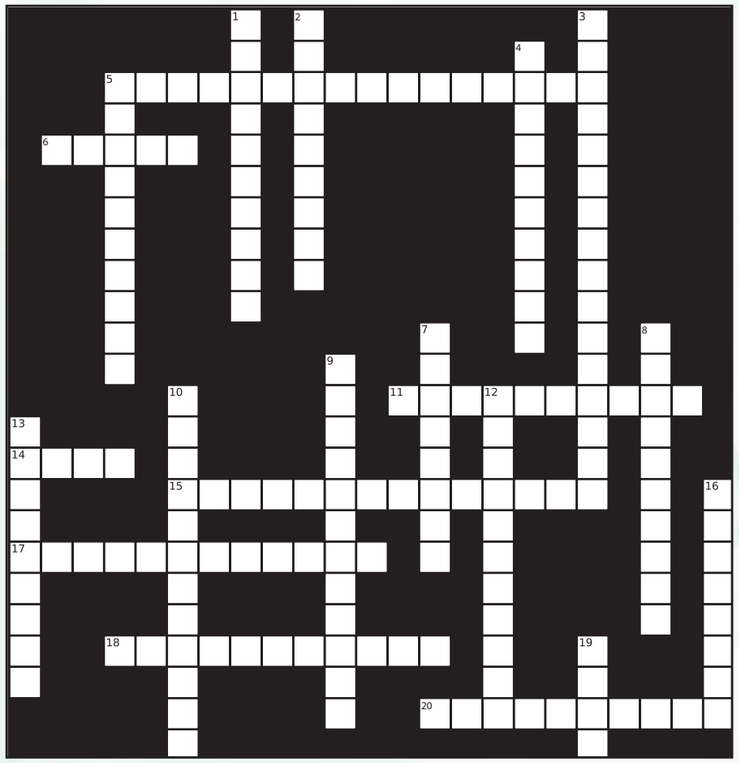
In human medicine, thoracoscopy is widely used for the diagnosis of many thoracic diseases. Minimally invasive surgical procedures such as pericardiectomy, PDA ligation, lung lobectomy, abscess drainage, treatment of pneumothorax, chylothorax, and herniated intervertebral disks. The benefits of thoracoscopy in human surgery relate primarily to lower morbidity and more rapid recovery. Although not all of these procedures have been described in veterinary medicine, the benefits of minimally invasive surgery would be expected to be similar. Visualization of intrathoracic structures is superior to open surgery due to lighting and magnification. In dogs, thoracoscopy is currently indicated for biopsy or removal of pulmonary, mediastinal and pleural masses; drainage of pleural fluid; thoracic duct occlusion; pericardial drainage and partial pericardiectomy; lung biopsy; foreign body removal; and spontaneous pneumothorax treatment. Thoracoscopy has also been used to perform limited approach PDA ligation in dogs. Canine thoracoscopy requires a video camera system; a halogen light source; a thoracoscopic telescope (usually 4-5mm diameter); various operative cannulae, and minimally invasive tissue instruments (scissors, grasping forceps, electrocautery).

In most cases, routine general anesthesia is adequate but some cases may require selective intubation of one bronchus to allow the contralateral lung to collapse for improved visualization. Intermittent positive-pressure ventilation is required as for an open thoracotomy as a pneumothorax is created early in the procedure. Access to the thorax with the telescope is obtained by placing a cannula in the xiphoid region and further cannulae are placed between the ribs for instrument access. Care is taken to avoid puncture of underlying organs during cannula placement using blunt obturators.

Depending on the disease process the chest is evacuated of air at closure or a chest tube is placed through the xiphoid cannula site for continued drainage.

The sheer size of Diesel's chest made thoracic access and instrument portal placement difficult. The instrument portals were placed opposite each other at the 9th intercostal spaces which meant each instrument was handled with arms wide spread, and muscle fatigue was a problem. Despite the challenges of Diesel's procedure, we were able to remove a large window of pericardium and place a thoracostomy tube with an excellent outcome.

Medicine Crossword - by Mike Coleman



Across

5 Tumour of the adrenal gland
6 Best covers band in a vet clinic in New Zealand
11 'Viagra' for pulmonary hypertension
14 Renal failure classification system
15 An 'emerging' feline gastrointestinal infection:...foetus
17 Topical antifungal used to treat nasal Aspergillus infection
18 The virus that causes FIP
20 Common type of brain tumour

Down

1 New name for Haemobartonella
2 Non-steroidal used for treatment of transitional cell carcinoma
3 Immune disease of the neuromuscular junction (2 words)
4 Bacterial component of kennel cough complex
5 Phosphodiesterase inhibitor commonly used now in dogs in heart failure
7 Potential cause of pseudo-Addisons disease
8 One medical treatment option for Cushings disease
9 Irish Wolfhounds are known to get idopathic atrial .....
10 Purine antagonistic immunosuppressive drug
12 Another name for Adriamycin is .....
13 ..... is used for initial IV treatment of ventricular tachycardia
16 Most common intestinal tumour in cats
19 Cats are not small .....

Answers available at www.vsg.co.nz from 1 August 2009. Please fax, email or post your answers to VSG®, and ensure you include your name, and clinic. All correct answers go into the draw for a book by Nelson & Couto, or a bottle of Bollinger. Congratulations to Neilan Snowden, a veterinary student from Massey University, who won the prize for the Surgery Crossword in our April newsletter. Neilan has won a bottle of Dom Perignon.

The Diagnostic Imaging of Pericardial Effusion - by Chris Warman

When one suspects the presence of intra-thoracic disease, diagnostic radiology is required to further investigate this suspicion. Whilst other imaging modalities may reveal superior performance in quantifying certain intra-thoracic disease entities, plain radiology is still the starting point for diagnostic imaging in any suspected thoracic disease. Plain thoracic radiology will give strong indications as to whether the disease is centered within the pleural space, the lung field or the cardiovascular system. Evaluation of plain thoracic radiographs will allow the clinician to establish a solid differential diagnosis list and shed light as to the appropriate way forward. The plain radiographic findings will assist the clinician to decide which of other imaging modalities, such as ultrasound or computed tomography, would be the most useful in the diagnostic process. Similarly, the findings may indicate that abdominal radiology is required, or that contrast radiology of the thorax is the most appropriate way forward.

A right recumbent lateral image, revealing a greater increase in the cranio-caudal cardiac dimension, compared with the increase in the base-apex cardiac dimension. Multiple small soft tissue nodular lesions, consistent with pulmonary metastasis, can also be identified throughout the lung fields.

So what radiographic findings should heighten the clinician's suspicion that pericardial effusion exists in this patient? A large globoid cardiac silhouette, without evidence of localized cardiac chamber enlargement, is highly suspicious of pericardial effusion. Images of such cases, revealing severe pericardial effusion, can often be recognized in veterinary texts. But what of patients who have a lesser degree of pericardial effusion? The radiographic findings are often more subtle in this latter group and can be readily confused with other disease entities such as cardiomyopathy or bilateral atrioventricular valvular insufficiency. Given that many of the breeds which feature prominently in the statistics of cardiomyopathy, also rate highly in incidence figures of pericardial effusion, what radiographic findings can help the clinician to differentiate between pericardial effusion and cardiomyopathy or bilateral AV disease?

Pericardial effusion typically results in radiographic findings consistent with right-sided cardiac failure, so pleural and peritoneal effusions are more likely to be identified than features associated with left sided heart failure. Thoracic radiographic findings, such as a more rounded appearance to the cardiac silhouette, with a disproportionate increase in the craniocaudal cardiac dimension when compared with the base-apex dimension, an increased retrosternal radiopacity, with leafing of the ventral lung lobes and blunting of the lungs at the costophrenic angle, are a gamut of Roentgen findings that increases the index of suspicion that pericardial effusion is present. Hepatic enlargement and loss of abdominal serosal detail are abdominal radiographic findings that would tend to suggest right-sided cardiac failure is present rather than left-sided failure. Radiographic findings which reveal an increase in the base-apex dimension in addition to a craniocaudal increase in the cardiac silhouette dimension, with dorsal lifting of the trachea and splitting of the mainstream bronchi, or a prominent soft tissue bulge reflective of left atrial enlargement, with or without perihilar alveolar infiltrates, are features more commonly associated with dilated cardiomyopathy than pericardial effusion.

Sonographic examination will readily differentiate between pericardial effusion and cardiomyopathy. With ultrasound, even minor pericardial effusion can be identified. When pericardial effusion exists in moderate to severe amounts, it is often possible to identify diastolic filling failure of the right atrium and occasionally diastolic filling failure of the right ventricle. If the peritoneal effusion develops slowly, diastolic right-sided cardiac dysfunction may be relatively mild. If right atrial filling failure is identified with only a small amount of effusion, this filling failure is typically due to a lack of compliance within the pericardium itself, rather than the volume/pressure effects seen with large volume pericardial effusion. Diagnostic imaging features of right-sided heart failure, when only a small amount of pericardial effusion is present, is more typical of restrictive pericardial disease. Thorough sonographic examination of the right atrioventricular junctional region is always recommended when pericardial effusion is present. The right atrium and right atrioventricular junctional areas are common sites for tumour development. Approximately 50% of patients presenting with pericardial effusion in New Zealand, will reveal a neoplastic lesion associated within the right atrium or at the right atrioventricular junctional area.

A small amount of anechoic pericardial effusion is identified and a right auricular mass is located between the cursors.