SAVA KZN Branch Meeting
San Lameer
21-22 May 2016

Programme

Saturday 21 May 2016		
12:30 - 14:00	LUNCH AND REGISTRATION	
14:00 - 15:00	Abdominal Biopsy Techniques	Dr Sara Boyd
15:00 - 16:00	GIT Surgery - Ensuring no leaks	Dr Sara Boyd
16:00 - 16:20	TEA BREAK	
16:20 - 17:20	Choosing the right Diagnostic tests - FIV/FeLV/FIP	Prof Andrew Leisewitz
17:20 - 18:20	Avoiding Common Pitfalls	Dr Phil Rees *et al*
	CHILL TIME	
19:30 - late	DINNER AND ENTERTAINMENT *sponsored by Ultra Dog*	
Sunday 22 May 2016		
07:00 - 09:00	BREAKFAST AND REGISTRATION	
09:00 - 10:00	Diaphragmatic Hernia Management and Surgery	Dr Sara Boyd
10:00 - 11:00	Antibiotic treatment of skin disease	Prof Andrew Leisewitz
11:00 - 11:20	TEA BREAK	
11:20 - 12:20	Otitis externa	Prof Andrew Leisewitz
12:20 - 13:20	Canine Prostatic Disease	Dr Daniela Steckler
13:20 - 15:00	LUNCH	

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South African Veterinary Association
Suid-Afrikaanse Veterinêre Vereniging

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CV - Dr SM Boyd

Dr Sara Boyd graduated in 1997 from Onderstepoort Veterinary Faculty with a BVSc. After graduating she went to England for 18 months where she worked in small animal private practice. In 1999 she was offered a position at Onderstepoort as a resident in the Department of Small Animal Surgery. She started her Masters degree in surgery and later became a senior lecturer at Onderstepoort, teaching both under graduate and post graduate students. She left Onderstepoort in September 2001 to join Dr Eugene Buffa at Johannesburg Specialist Veterinary Centre. She completed her MMVedVet degree in April 2004 and is currently a partner in this practice.

Johannesburg Specialist Veterinary Centre is one of the largest private specialist hospitals in South Africa with two qualified surgical specialists and one internal medicine specialist. It is currently a 7 vet hospital and is training both surgical and medical residents. Sara is involved in presenting continuing professional development courses both in South Africa and abroad. Her special interests lie in the field of soft tissue and neurosurgery. She is also one of the few South African veterinarians regularly performing Canine Cementless Total Hip Replacement. She is married to Mark Boyd and has 3 children: Jordan, Tyler and Aimee.

ABDOMINAL BIOPSY TECHNIQUES

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Introduction

Celiotomy is the correct terminology for a surgical incision into the abdominal cavity[1]. The lack of sophisticated equipment required makes celiotomy one of the most commonly used procedures for both therapeutic and diagnostic purposes. The most common approach is via a ventral midline incision; however paracostal and paralumbar approaches are also possible and are useful for limited exposure of specific organs like the kidneys or adrenal glands[1]. Regardless of the reason for opening the abdomen, the general principles of abdominal surgery should be adhered to whenever an invasive exploratory celiotomy is performed. When performed for diagnostic purposes, special care must be taken not to create additional problems for the animal, like causing haemorrhage, adhesions or introducing infection into the abdomen.

Liver

The cranial location of the liver may make taking liver biopsies difficult, especially in deep-chested dog breeds. The liver is also an extremely friable organ, especially in the presence of disease. Advanced liver disease may be associated with a decrease in clotting factors which can make intra-operative haemorrhage a risk and require a preoperative whole blood transfusion. Liver disease may also cause hypoalbulminaemia which leads to delayed wound healing. Blood protein levels and a full blood count prior to surgery, are an important part of pre-operative planning.

The liver consists of 6 relatively distinct lobes which usually have sharp edges and a uniform appearance to the parenchyma. Lobes may become rounded in very young animals or in animals with congested, scarred or infiltrated livers. Where possible, the left side of the liver should be biopsied, especially when using percutaneous techniques, in order to avoid damage to the biliary tree[2,3].

Biopsy techniques include percutaneous methods (blind or ultrasound guided), laparoscopy or celiotomy. Percutaneous techniques are not recommended in animals with thrombocytopaenia, cavitatory or highly vascular lesions[3,4,5]. When direct visualization is used, the guillotine method is the most effective way of taking meaningful biopsies. Tru Cut or skin biopsy punches may also be used and are particularly useful for isolated lesions in the centre of one of the liver lobes[3,4].Chromic cat gut in an appropriate size to combat breaking strength, is the most commonly used suture material. It is cost effective, readily available, has excellent knotting ability and is absorbed by phagocytosis once a fibrous ligation has formed.

In the case of far cranial liver lesions, large friable masses or in very deep-chested breeds, it may be useful to temporarily puncture the diaphragm and ventilate the patient. This allows the entire diaphragm to move caudally and in so doing, greatly increase exposure and accessibility of the liver lobes.

Stomach

It is advisable to withhold food for at least 8 to 12 hours prior to surgery on the stomach. 18 to 24 hours is recommended for gastroscopic biopsy techniques, where visualization is of utmost importance. In paediatric patients, hypoglycemia can be a problem and so starving is only advised for 4 to 6 hours in these patients[6]

Surgery of the stomach has relatively little post-operative complications due to the good blood supply and reduced numbers of bacteria[6,7]. It also has close proximity to the omental defense mechanisms and rapidly regenerating epithelium. Unless a specific lesion has been identified in the stomach, biopsies should be taken from a hypovascular site along the ventral aspect of the stomach. Always avoid damage to the greater gastroepiploeic blood vessel that run along the ventral edge.

The pyloric region should be avoided due to the risk of outflow obstruction occurring at a later stage. Where the lesion of interest occurs on the pyloric sphincter, incision may need to be adapted during closure of defect, to ensure that a stenotic, intraluminal section is not created. Stomach biopsy sites should be closed in two layers using a 3/0 or 4/0 monofilament, absorbable suture material. Atraumatic, swagged on needles are mandatory and easily affordable, even in general practice.

Gentle pressure is the best way to stop any residual bleeding. Haemostatic aids like Surgicel (cellulose impregnated gauze swabs) can also be used, but are seldom necessary.

Small Intestine

The small intestine can be biopsied using endoscopic, ultrasonographic, laparoscopy techniques or surgically via a celiotomy. Endoscopic techniques allow good visualization of the mucosa and multiple biopsies can be taken, but biopsies are not full thickness and biopsy of the jejunum is rarely possible[6,7]. Celiotomy, on the other hand, allows examination of the entire gastrointestinal tract as well as all other abdominal organs. Multiple, full thickness biopsies are possible, but direct visualization of the mucosa is not.

When performing surgical biopsies of the small intestine, multiple biopsies should be taken. A scalpel, Metzenbaum scissors or a skin biopsy punch can be used. The skin punch biopsies are a very effective technique which provides full thickness, good quality sample and defects that are easy to close. Longitudinal biopsies may be closed in a transverse direction to prevent a decrease in diameter of the intestinal lumen. Omentum is gently wrapped over the biopsy site prior to abdominal closure. Haemostatic agents are almost never required.

Spleen

The spleen is usually biopsied in order to diagnose causes of splenomegaly or infiltrative or neoplastic disease. Percutaneous techniques are effective for the diagnosis of diffuse disease like mastocytosis or lymphoma. Cavitatory lesions should not be attempted using this method, as these may rupture and this could have fatal consequences. When surgical biopsy is required, we use similar techniques to those used in the liver: guillotine method or overlapping, horizontal mattress sutures are used to obtain a wedge or oval shaped biopsy sample. In cases of large tumours or diffuse disease, it may be easier and less risky to perform a total splenectomy.

Pancreas

Pancreatic tissue needs to be handled with extreme care at all times to prevent pancreatitis, adhesions or oedema from occurring. Having said that, the pancreas is easily accessible and should not be avoided if gross abnormalities are present. Biopsies are taken more commonly in feline patients, as pancreatic disease in this species is more difficult to diagnose than in dogs. Both limbs of the pancreas should be examined and if necessary biopsied. The easiest region to sample is the caudal aspect of the right limb. Samples should be taken from the edge of the pancreas. Tru Cut tissue core biopsy needles can also be used to gain a suitable sample and this can be done using ultrasound guidance, but direct visualisation is preferred due to proximity of other organs and vital vasculature.

Colon

Surgery of the colon carries the risk of more complications than does the rest of the GIT, due to the fact that it contains more bacteria and has a significantly poorer blood supply[7]. Principles of colonic surgery include causing minimal damage to the blood supply and making sure that each suture is precisely tied and includes the submucosal layer. Surgical sites should be wrapped in omentum prior to closure of the abdomen and surgical sets should also be changed prior to closure of the abdomen. Where possible, full thickness biopsies should be avoided and for this reason, colonoscopy with multiple mucosal biopsies is the preferred diagnostic technique.

Bladder

Biopsy of the bladder is relatively easy. Stay sutures should be used in the apex of the bladder to make manipulation less traumatic and to minimize spillage. Draining the bladder prior to perforation is useful to decrease abdominal contamination. Biopsy samples can be taken from the dorsal or ventral aspect of the bladder. A stab incision is made into the bladder lumen and then slices are taken from the edge of the incision prior to closure. Specific areas of thickening or discoloration should be targeted. 3/0 or 4/0 absorbable, monofilament suture material is recommended and used in a continuous fashion in order to close the bladder. Performing a leak test is easy and cost effective and may help pin point potential weak spots in the suture line.

Prostate

Occasionally it may be necessary to biopsy the prostate. This is best achieved via a ventral abdominal midline or paramedian incision. A catheter should always be preplaced in the urethra, so that this structure is avoided during biopsy taking. A wedge shaped biopsy is removed from the ventrolateral parenchyma and capsule can be over sewn with absorbable suture material to decrease haemorrhage. It is often indicated to drain concurrent cysts that may be adding to the dog's discomfort and ease of urination.

Mesenteric lymph nodes

Where possible, at least two nodes from the area of interest should be taken. If large enough, Tru Cut or fine needle aspirate techniques can be used, but wedge biopsies under direct visualisation are preferred. Horizontal mattress sutures can be preplaced through the lymph node and then a 15 scalpel blade used to cut a suitable wedge. Alternatively, perform a complete lymphadenectomy.

Kidney

The kidneys lie in the retroperitoneal space. The right kidney lies at the level of the thirteenth rib whilst the left kidney lies approximately 5cm caudal to the last rib. Biopsies must always include as much of the renal cortex as possible, as samples containing the renal medulla are seldom diagnostic[5]. Biopsy techniques used include: percutaneous methods (of which ultrasound guided techniques are preferred), laparoscopy, surgery or keyhole abdominal surgery techniques. Automated biopsy devices or Tru Cut needles may be used in the latter two techniques. Alternatively wedge biopsies are performed. In this last technique, mattress sutures are placed deep to biopsy site and when tied include a piece of omentum into the incision. This prevents bleeding and helps prevent sutures from pulling out of the very friable kidney capsule. Once again, haemostatic agents like Surgicel should be on standby.

Adrenal Glands

These glands are usually removed in their entirety when involved in disease processes and seldom if ever are biopsied. Generally surgeons should try and stay outside the capsule of the adrenal glands, especially when neoplasia is suspected, as leaving small pieces behind in the abdomen

may lead to tumour seeding. This surgery can be technically difficult due to local fat deposits (most of affected patients are excessively fat due to the cortisol production) and vascular structures associated with the glands.

Some key tips that help with exposure and resection are: to always have a scrubbed assistant, to have adequate abdominal swabs available to help with isolation of the gland, to perform a paracostal incision to increase exposure and to tie off the associated phrenicoabdominal blood vessels with courses directly over the adrenal gland, before attempting blunt dissection.

Conclusion

On the whole, biopsy techniques are an extremely useful means of obtaining a definitive diagnosis. They form an essential tool in diagnostic medicine and surgeons need to be proficient in the various techniques.

As long the basic surgical principles are adhered to, the techniques are safe and the tips provided in this paper should make taking full thickness, good quality biopsies simple and affordable.

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GASTROINTESTINAL TRACT SURGERY - AVOIDING LEAKS

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Introduction

The possibility of complications occurring with gastrointestinal (GI) surgery is a very real threat to surgeons, regardless of their level of expertise. In fact, it is amazing that the gastrointestinal tract (GIT) is able to heal at all. There is constant motion, the lumen contains fluid and there is food, bacteria and enzymes in contact with the incision at all times. The reason that the GIT is able to heal so well is that it has a profuse vasculature, rapidly regenerating epithelium and a natural defence mechanism provided by the omentum[1].

Celiotomy refers to a surgical incision into the abdominal cavity. Regardless of the reason for the procedure, general principles of abdominal surgery should be adhered to whenever an invasive exploratory celiotomy is performed. The most common approach to the abdomen is via a ventral midline incision. A ventral midline incision can extend from lateral to the xiphoid process to ventral to the pubic symphysis. The superficial epigastric vein can be clamped and ligated to improve exposure[2].

The three principle sections of the GIT that will be discussed are the stomach, small intestine (SI) and large intestine (LI). Four anatomical layers form the GI tube: the mucosa, submucosa, muscularis externa and serosa. The blood supply to the GIT is provided by the mesenteric arteries which penetrate the GI wall and then split into three arteriovenous plexuses.

Dehiscence usually occurs somewhere between 72 to 96 hours after wound creation. This period is known as the “lag phase” of GIT healing and is the most critical period[3]. Dehiscence leads to spillage of GI contents into the abdomen with resulting peritonitis and the consequences of this may be fatal. It can be avoided by choosing the correct size and type of suture material, catching sufficient amounts of the correct adjacent tissues and by tying careful, surgically correct knots.

The role of the omentum is vital in GIT surgery. It plays a major role in sealing GI wounds; it helps restore blood supply, controls infection and facilitates good drainage. Pedicle omental grafts are preferred over free grafts, as these tend to discourage adhesion formation. Ideally omentum should be wrapped or sutured (not usually necessary) around all GI incisions prior to closure of the abdomen[4].

Stomach

The stomach has the thickest wall of any of the sections of the GIT. It is extremely vascular and avoiding unnecessary damage to the vasculature, is important. Because of this rich blood supply and low bacterial numbers, most incisions into the gastric wall will heal despite the surgical technique used. The suture technique of choice is a double layer, continuous inverting pattern like the Cushing or Lembert[1]. The first layer is placed in the mucosa / submucosa and the second in the seromuscular component. Monofilament, absorbable suture material is advocated and suture line ulcers have been reported when non-absorbable suture material was used[7].

Small Intestine

Healing of the SI occurs optimally when there is direct apposition of the layers of the intestinal wall. This allows the submucosal arteriovenous plexuses to align and reepithelialisation can occur within 3 days without compromising the diameter of the lumen. Mucosal eversion and tissue overlap retard reepithelialisation by causing mucosal ischaemia and necrosis[5]. Further complications of this are increased inflammation, intestinal stenosis and formation of abdominal adhesions. There will also be a decrease in bursting strength and therefore an increased incidence of dehiscence and leakage[3,5,6].

Trimming the excess mucosa and ensuring that there is no debris on the cut edges prior to anastomosis, decreases the chance of leakage[5,6]. Various suture patterns have been described and tested in the SI. These include simple interrupted, modified Gambee or simple continuous patterns. Crushing verses non-crushing techniques have also been described. Results are fairly similar between all of these; however crushing techniques have been shown to cause more micro trauma and necrosis. Knots should be tied securely and should remain on the extraluminal side of the GI tube[7]. A useful technique is to angle the needle so that the serosal surface is engaged slightly further from the edge than the mucosal suture. Prior to closing the abdomen, leakage tests using sterile saline are recommended and surgeons should then also wrap the anastomosis site in omentum[4].

Serosal patching is a technique that consists of placing the anti-mesenteric border of an adjacent loop of intestine over a suture line in the GIT and securing this to it with sutures. The aim of this procedure is to provide the damaged section with a fibrin seal, blood supply, support and a barrier against leakage. The use of serosal patching is recommended whenever viability is questionable or if dehiscence has already occurred. Kinking of the adjacent intestinal loops should be avoided when using this technique[1,8].

Large Intestine (Colon)

The colon demonstrates the same mechanisms of healing that occur in the stomach and SI, however the entire process is delayed. Morbidity and mortality rates in the colon are higher due to the following reasons: colonic circulation is poor, the blood supply is segmental, the population of bacteria is high and the faeces place additional mechanical strain on the incision sites[1,8]. A further disadvantage is that the omentum rarely reaches that far caudally[4]. The risk of early incisional dehiscence is high in the colon. Effective means of counteracting some of these problems are to eliminate faeces using enemas at least 24 hours before the procedure, use effective antibiotic protocols and practice good serosal apposition. The holding layer for the colon is also the submucosal layer and the recommended suture pattern is a simple, interrupted, appositional pattern or a modified Gambee[7]. The sutures should be placed 3 to 4 mm apart and 2 to 3mm from the cut edge. Using commercial end-to-end anastomosis staple guns are also an effective, but expensive technique to close colonic incisions[1,8].

Possible Complications

Dehiscence and the resulting peritonitis are extremely severe consequences to surgery of the GI system. Peritonitis is the inflammation of the peritoneum, which may be primary or secondary and infectious or non-infectious. Post surgical peritonitis is the most common type and is typically classified as secondary and infectious[2]. The three main causes of dehiscence include pre-existing intestinal trauma, pre-existing peritonitis or hypoalbuminaemia.

Peritonitis is suspected when the abdominal effusion contains intracellular bacteria, when spontaneous extraluminal gas bubbles are present on radiographs or when the peritoneal effusion contains more than 25 000 neutrophils per microliter. The goals of treatment of peritonitis include most importantly, isolating and removing the source of the contamination, resolving the infection

and restoring the normal fluid and electrolyte imbalances[2,8]. Surgery is indicated when the cause of the contamination cannot be found or when bowel rupture is suspected.

Lavage with sterile intravenous fluid is indicated in animals with diffuse peritonitis, but should be used with caution in localised cases in order to prevent dissemination of the infection. Despite aggressive therapy, the prognosis for peritonitis remains guarded and so, as in many surgical cases, prevention is better than cure.

Conclusion

The gastrointestinal tract will usually heal without complications provided atraumatic techniques are used, tissue viability is preserved and contamination is minimised. Adhering to basic principles and using due diligence when suturing, can result in complications being minimised and surgical success rates, improved. Post operative monitoring of the patient can further improve success rates by picking up any potential complications as early as possible and correcting them before the animal becomes too debilitated.

Recommended Reading

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