The rectum begins at the pelvic inlet and continues caudally to the anus. It is attached to the ventral surface of the sacrum by the mesorectum. The pelvic nerve plexus lies laterally to the middle portion of the rectum. Blood is supplied to the rectum via the cranial, middle, and caudal rectal arteries.

Rectal surgery is generally performed to treat perforations or neoplasia. Intraoperative complications of rectal surgery include difficult exposure and pre-existing peritonitis. Postoperative complications include dehiscence and associated peritonitis, stricture, and fecal incontinence.

Inadequate Exposure

The rectum lies within the pelvic canal making complete exposure challenging. There are three basic approaches to the rectum available to the surgeon: The rectal pull through, the dorsal approach to the rectum, and a ventral approach using either a pubic symphysiotomy, a pubic osteotomy, or an ischial osteotomy.

Accurate assessment of the size of a tumor or localization of a lesion such as a rectal perforation is critical to selecting the best surgical approach for each case. The wrong surgical approach can make successful completion of the surgical procedure extremely difficult. A great deal of information can be gained by a simple digital rectal examination. Larger rectal perforations can be palpated and their location assessed. Tumors within reach can be palpated and their location compared to the pubic brim. For larger mural masses such as leimyomas, preoperative CT scanning provides accurate information on the location and size of the tumor and helps surgical planning.

As a general rule, tumors that extend to the pubic brim or beyond will be difficult to access appropriately with a dorsal approach to the rectum. Similarly, these tumors will be difficult to completely resect with a simple rectal pull through. The amount of rectum and colon that can be mobilized with a rectal pull through can be increased by initially performing a ventral midline celiotomy, mobilizing the descending colon, and ligating and transecting the caudal mesenteric artery.

Pre-existing Peritonitis

Dogs and cats can suffer penetrating wounds to the rectum, generally from projectiles, such as bullets or arrows, or occasionally from bites. In some cases contamination remains localized, but if the peritoneal reflection on the rectum is disrupted, peritonitis rapidly ensues. It is important to remember that the intra-pelvic urethra can also be injured by projectiles in this area. The integrity of the urethra should be determined prior to surgery as concurrent urethral injury can require a change in the planned surgical approach.

Septic peritonitis is a severe, life-threatening condition that poses many challenges for the small animal veterinarian. A complete discussion of peritonitis is beyond the scope of these proceedings. However understanding peritoneal fluid and protein loss, hypovolemia, and the Systemic Inflammatory Response Syndrome (SIRS)/sepsis, bacterial contamination, antimicrobial pharmacology, and effective resuscitation are vital to successful treatment.
Once the animal is stabilized, the rectum should be explored as controlling the source of peritonitis is imperative. For wounds affecting the caudal, dorsal rectum, the dorsal approach to the rectum provides the best exposure. If the peritoneal reflection is found to be damaged at surgery, generalized peritoneal contamination should be assumed and a subsequent laparotomy performed. If the injury affects other organs in the abdomen or if the urethra is involved, a ventral midline laparotomy combined with a pubic symphysiotomy is indicated.

Postoperative Dehiscence and Stricture

Postoperative dehiscence and strictures after rectal surgery are uncommon but difficult complications to deal with. Dehiscence most likely occurs because of inadequate blood supply at the sutured bowel edges, excessive tension on the anastomosis site, inappropriate suture technique or pattern, and possibly residual neoplasia at the edges of bowel anastomosis. Systemic factors including poor nutritional status, hypoalbuminemia, hyperadrenocorticism, or exogenous steroid administration may also contribute to dehiscence.

Ensuring adequate blood supply to the anastomotic site is vital. In an experimental study, Goldsmidt et al demonstrated that the cranial rectal artery supplied the majority of blood to the terminal colon and the rectum. Ligation of the cranial rectal artery in conjunction with colorectal resection and anastomosis resulted in rectal congestion and edema and partial to full thickness rectal mucosal necrosis. This study illustrates the importance of preserving the cranial rectal artery whenever possible. In some cases it is possible to carefully dissect it away from the rectum prior to resection, ligating small perforating branches to the rectum.

Partial or complete dehiscence requires re-exploration. If the original surgical site was caudal to the peritoneal reflection and the peritoneal reflection was not disrupted, there will not be contamination of the peritoneal cavity. The area of dehiscence can be approached locally, generally via a dorsal or modified dorsal approach. The bowel edges are debrided back to healthy bleeding tissue. The edges are apposed with a single layer of single interrupted, appositional sutures using 3/0 or 4/0 PDS. Omentalization of this area is possible but requires a prior laparotomy to separate the dorsal leaf of the omentum from its pancreatic attachments. The omentum must be brought out of the abdomen and placed in a caudal, ventral pocket where it can be subsequently accessed and mobilized during surgery to repair the rectum.

Dehiscence of an intrapelvic anastomosis with direct communication to the abdomen necessitates a complete re-exploration. After debridement and re-anastomosis the area is thoroughly lavaged. All lavage fluid is removed. The surgical site is then omentalized. Serosal patching in within the pelvis is difficult. Localized drainage of the area or generalized drainage of the peritoneal cavity is controversial. Latex (as used in Penrose drains) has been shown to inhibit bowel wound healing. Whilst reportedly clinically effective, it is not clear how much of the peritoneal cavity is drained when silastic closed-suction drains are used.

Strictures most likely occur for the same reasons as rectal anastomotic dehiscence. Based on limited clinical experience strictures are more likely to occur when surgery is performed on the caudal descending colon and proximal rectum. Affected animals strain to defecate and may become inappetent, lethargic, and depressed. The diagnosis is often made by digital rectal examination. Successful treatment with balloon dilation with and without triamcinalone injections has been reported.
Fecal Incontinence

Fecal continence depends on the presence of afferent sensory fibers in or around the rectum, intact nerve tracts to and from the CNS, intact internal pudendal and caudal rectal nerves, an intact external anal sphincter and a functional reservoir. As fecal material passes into the rectum, sensory fibers relay the information to the CNS. If the animal cannot defecate, the external sphincter contracts (“sphincter continence”) and the colon relaxes to accommodate the fecal mass (“reservoir continence”). When considering removal of part of the rectum, possible damage to these vital structures should be considered, and the owner informed of the possibility of incontinence.

In the majority of rectal surgeries, it is unlikely that the internal pudendal and caudal rectal nerves will be damaged. Similarly, even with extensive rectal pull-throughs, the external anal sphincter is left intact. Incontinence results instead from disruption of the afferent fibers located in or around the rectum. In experimental dogs, removal of 4cm of rectum using a dorsal approach preserved fecal continence. However removal of more than 6cm of rectum produced incontinence. However in a recent article, far more extensive rectal resections using a transanal approach were reported and the rate of postoperative incontinence was low. It appears from this and many other studies that preserving the as much of the anus and distal rectum is important in maintaining postoperative sphincter continence. Dogs that are incontinent postoperatively should be managed with a low residue diet and fed two to three times daily. The dog should be walked for 20-30 minutes immediately after feeding. In many animals the gastrocolic reflex will result in emptying of the colon and rectum.

References