SURGICAL MANAGEMENT OF SMALL INTESTINAL MASSES
John Berg, DVM, DACVS
Tufts Cummings School of Veterinary Medicine, N. Grafton, MA

Key Points

- Common surgically-managed small intestinal tumors of dogs include carcinomas, leiomyosarcomas, and gastrointestinal stromal tumors (GIST’s)
- The most common surgically-managed intestinal tumor of cats is carcinoma.
- Surgical management of intestinal tumors most commonly consists of wide resection and anastomosis with biopsy of mesenteric lymph nodes
- Intestinal lymphoma of cats can be managed surgically if there is obstruction or perforation, with a low risk of intestinal dehiscence.

Approximately 50% of surgically-managed canine small intestinal tumors are epithelial in origin, and approximately 50% are mesenchymal in origin. Many mesenchymal tumors previously categorized as leiomyosarcomas are actually gastrointestinal stromal tumors, or GIST’s. GIST’s likely arise from the interstitial cells of Cajal, and by definition, overexpress the receptor tyrosine kinase KIT. The diagnosis is based on demonstration of KIT overexpression using immunohistochemistry. Patients with GIST’s may benefit from adjuvant therapy with receptor tyrosine kinases inhibitors such as Palladia, although this has not yet been demonstrated in clinical studies. Mast cell tumors and lymphomas may also occur as intestinal mass lesions in dogs. All intestinal tumors have potential to metastasize to the mesenteric lymph nodes and more distant sites, and for carcinomas and sarcomas, mesenteric lymph node status is highly predictive of survival.

Clinical signs of small intestinal tumors vary with the level of obstruction. Tumors in any small intestinal location can cause anorexia, lethargy and weight loss. Upper small intestinal tumors tend to cause vomiting and dehydration, whereas lower small intestinal tumors often cause diarrhea. Tumors of the cecum (which is actually a portion of the large intestine) often cause a unique spectrum of signs: because the cecum is a blind-ended appendage of the intestine, cecal masses often do not cause obstruction and therefore become extremely large before being detected. Signs may include abdominal distension, bowel perforation, and septic abdomen. Cecal masses are occasionally confused with splenic masses on abdominal ultrasound.

The diagnosis of intestinal masses is based largely on imaging, and clinical pathology usually does not contribute substantially to the diagnosis. While abdominal ultrasound has replaced contrast radiography in many practices, contrast studies can be valuable in that they are unaffected by gas accumulation within the bowel, and the pattern of obstruction demonstrated on contrast studies can suggest tumor type (eg., carcinomas often cause concentric narrowing of the intestinal lumen). Ultrasound is a noninvasive test that reliably allows detection of intestinal masses and confirmation that the bowel is the site of origin. Ultrasound also allows an assessment of the mesenteric lymph nodes, although it cannot reliably allow a determination whether enlarged nodes are hyperplastic or metastatic.

Surgery for small intestinal masses consists of biopsy of an associated mesenteric lymph node, biopsy of any potentially metastatic lesions in the liver or peritoneum, and wide intestinal resection and anastomosis (R+A). Biopsies are performed first to avoid exposing normal tissues to instruments that were in contact with luminal contents. The mesenteric
nodes are biopsied rather than removed because removal risks disruption of the intestinal blood supply. Mesenteric nodes can be biopsied by incising the peritoneum overlying the node, obtaining a small wedge with a blade, and closing the peritoneum if necessary to limit hemorrhage.

Duodenal tumors that approach or involve the common bile duct or its termination may require ligation and division of the bile duct and cholecystoduodenostomy. Approximately 30-40% of patients undergoing this procedure develop episodes of ascending cholangiohepatitis postoperatively, and require antibiotic therapy.

**Figure 1:** Gastroduodenostomy and cholecystoduodenostomy for a duodenal carcinoma

![Image](image1.jpg)

Jejunal tumors are treated by wide R+A. Three to 5cm margins of grossly normal intestine should be obtained on either side of the tumor. Closure can be accomplished with either appositional interrupted or continuous sutures. Care should be taken to excise or invert intestinal mucosa to allow apposition of all intestinal layers. Full thickness bites of intestine should be taken, with each bite about 4-5 mm in thickness and 4- mm from the previous bite. If the luminal diameters are unequal, the shorter diameter can be lengthened by transecting the bowel at an angle. The completed anastomosis may be leak tested and should be wrapped in omentum to limit the likelihood of leakage of luminal contents.

**Figure 2:** Resection of a jejunal GIST with wide intestinal margins.

![Image](image2.jpg)
Tumors arising from the tip of the cecum can be excised at the base of the cecum, followed by hand suturing of the tylectomy incision. Alternatively, resection and closure can be achieved in a single step using a GIA (gastrointestinal anastomosis) stapling device.

Tumors at the base of the cecum generally require a jejunocolonic or ileocolonic anastomosis. Because unequal luminal diameters are often present, this surgery can most easily be accomplished using a combination of the GIA and TA (thoracoabdominal) stapling instruments.

**Figure 4:** The GIA stapler is used to create a side to side anastomosis of the jejunum to the colon.

**Figure 5:** The TA stapling device is used to complete the anastomosis by closing the open intestinal lumens.
The prognosis for dogs with intestinal tumors depends largely on tumor type and the presence or absence of metastatic disease. Reported median survival times for carcinomas and leiomyosarcomas range from 6 to 21 months, and the presence of nodal metastases has been associated with decreased survival. At least one study has indicated that GIST’s may be associated with better survival than leiomyosarcomas.

The majority of surgically managed intestinal tumors in cats are carcinomas, which have a metastatic rate of approximately 75%. However, in the only available study of outcome, the presence of nodal metastases or carcinomatosis was not necessarily associated with poor long term survival. Intestinal lymphoma in cats is increasing in incidence, and surgery occasionally has a role in the diagnosis or treatment of the disease. Partial thickness biopsy often does not reliably distinguish small cell lymphoma from inflammatory bowel disease, and full thickness biopsies obtained at surgery are more accurate. Surgery is also indicated in the treatment of cats that present with intestinal perforation or obstruction. Although intestinal lymphoma is typically diffusely present throughout the bowel, cats undergoing full thickness intestinal surgery for the disease do not appear to be at greater risk of intestinal dehiscence than cats undergoing intestinal surgery for other conditions.