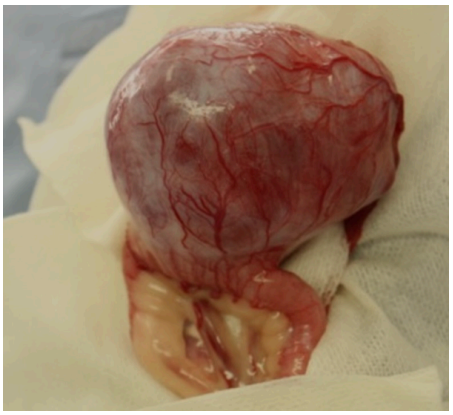
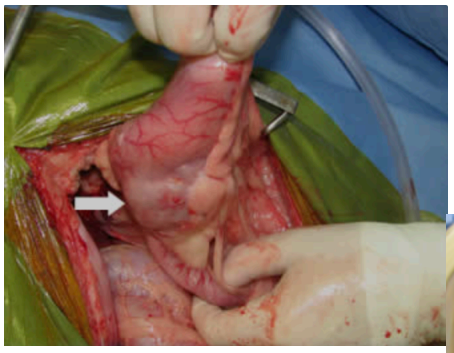
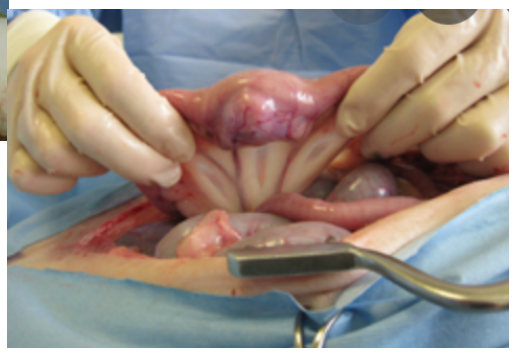
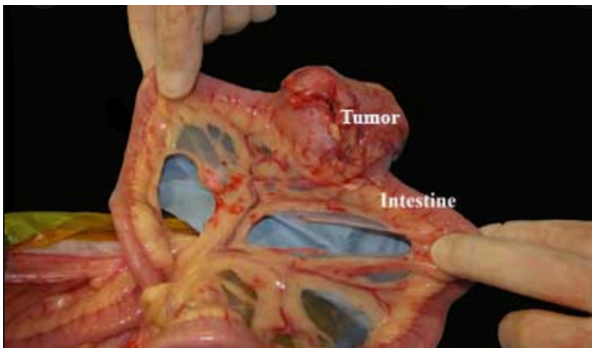
GASTROINTESTINAL (GI) CANCER

Associated Terms:
Intestinal Resection & Anastomosis, Intestinal Perforation, Intestinal Obstruction, Intestinal Necrosis, Intestinal Infection & Intestinal Neoplasia.









OVERVIEW

Many GI neoplasms in dogs & cats are biologically aggressive with a poor outcome, even with surgical & medical therapy. Intensive therapy is often necessary to improve patients' clinical status, although longterm prognosis is poor. Diagnostic staging tests are warranted in cases for which surgical resection is elected. In some cases, a relatively favorable prognosis can be achieved with extensive therapy, such as in dogs with adenocarcinoma or lymphoma of the large intestine & cats with low-grade lymphoma.

ETIOLOGY & PATHOPHYSIOLOGY

GI neoplasms are uncommon in dogs & cats, with gastric tumors representing <1% & intestinal tumors <10% of overall neoplasms in the dog & cat. Specific etiologic agents for GI neoplasia have NOT been identified. The increased risk of Belgian Shepherds for gastric carcinoma & of Siamese cats for intestinal adenocarcinoma & lymphoma, may reflect genetic predispositions. Feline leukemia virus has been suggested to be an underlying factor in development of feline GI lymphoma.

The average age of dogs with GI neoplasms is 6–9 years & of cats 10–12 years, though gastric leiomyomas tend to occur in older dogs (average age 15). Male has a slight tendency over female dogs & cats to develop GI neoplasia. GI neoplasms tend to be malignant in dogs & cats.

In dogs, adenocarcinoma is the most common gastric & large intestinal neoplasm, whereas lymphoma is more frequently seen in the small intestine, followed by adenocarcinoma & sarcomas such as GI stromal tumor (GIST) & leiomyosarcoma. Other reported canine GI neoplasms include carcinoid, adenoma, leiomyoma, carcinoma & inflammatory polyp.

Adenocarcinomas frequently affect the lower 1/3 of the stomach (eg, lesser curvature & pyloric region) & rectum. Gastric & small intestinal adenocarcinomas frequently metastasize to regional lymph nodes, liver & lung. At the time of diagnosis, up to ~50% of intestinal & up to 95% of gastric adenocarcinomas have metastasized.

GI lymphoma most commonly affects the small intestine as well as extra-GI organs such as the liver. Canine GI lymphoma is mostly a high-grade variant with rapid clinical progression. Colorectal lymphomas are predominantly B-cell immunophenotype (92%–100%), whereas other canine GI lymphomas are more commonly T-cell. Small-cell, low-grade GI lymphoma, a slowly progressive indolent lymphoma, occurs less commonly in dogs but can be clinically well-managed.

GI Stromal Tumors (GIST) are mesenchymal in origin. GIST, many of these tumors were likely classified as leiomyosarcomas. GIST typically occur in the cecum & large intestine. In contrast, leiomyosarcomas occur most commonly in the stomach & small intestine. Overall, GIST & leiomyosarcoma grow slowly & are slow to metastasize, with a reported metastatic rate of up to 30%.

In cats, lymphoma is the most common GI neoplasm, followed by adenocarcinoma & mast cell tumor (MCT). Both low-grade & high-grade GI lymphomas are frequently reported & their clinical behaviors are well-characterized in cats. Low-grade GI lymphomas are mostly mucosal & T-cell immunophenotype, commonly affecting the small intestines. Small intestinal high-grade lymphoma, however, can be either T-cell or B-cell in origin.

Adenocarcinoma is commonly identified in the feline intestinal tract, especially in the jejunum & ileum, but rarely in the stomach or large intestines. Feline adenocarcinomas are also biologically aggressive, with a high metastatic rate. Metastasis commonly occurs to regional lymph nodes (up to 50%) & lungs (up to 20%), while carcinomatosis can be seen in up to 30% of cats.

Other uncommonly reported GI tumors of dogs & cats include leiomyoma, fibrosarcoma, carcinoma, colorectal polyp & plasmacytoma.

SIGNS & SYMPTOMS

Clinical signs of GI neoplasia depend on the location & extent of the tumor & its possible metastases or paraneoplastic syndromes (eg, hypercalcemia, hypoglycemia). The most common clinical signs associated with GI neoplasia include:

Anorexia, Diarrhea, Vomiting (with or without blood), Lethargy &/or Weight Loss.

Signs of constipation or tenesmus may accompany colonic & rectal tumors.
An abdominal mass or organomegaly may be palpable on physical examination.
Abdominal pain & ascites may reflect peritonitis secondary to a ruptured portion of neoplastic bowel.

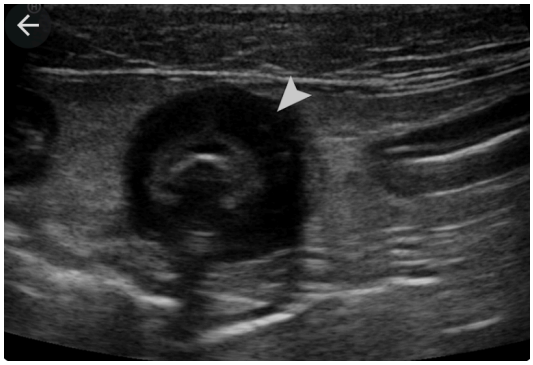
DIAGNOSTICS

Hematology & Serology

Routine laboratory studies & plain radiographs do NOT show specific changes associated with GI neoplasia. Hypoglycemia is often associated with leiomyomas/leiomyosarcomas. Hypercholesterolemia & increased alkaline phosphatase activity has been seen in some non-lymphomatous neoplasia. Microcytic anemia with or without hypoproteinemia is a common finding with ulcerated masses & chronic blood loss. Electrolyte & acid-base disturbances may reflect ongoing vomiting & can include hypochloremia, hypokalemia & metabolic alkalosis or acidosis. Paraneoplastic hypercalcemia has been associated with lymphoma & intestinal adenocarcinoma.

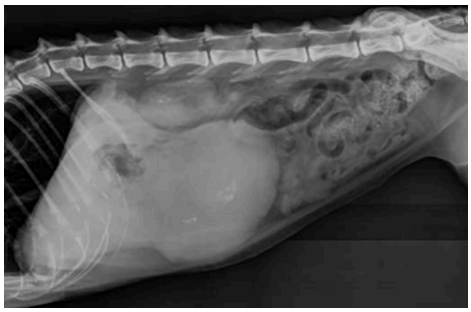
Abdominal Imaging

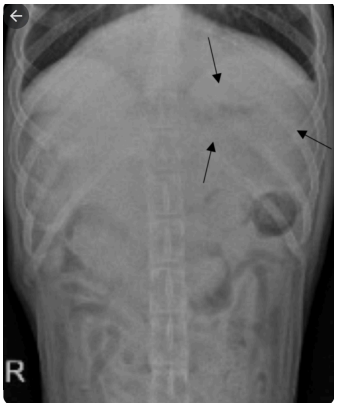
Contrast abdominal radiographs may reveal mass lesions in the GI tract or areas of ulceration. Abdominal ultrasonography may reveal focal or diffuse thickening of the GI tract & loss of normal layering. Regional lymph nodes may be enlarged & splenomegaly &/or hepatomegaly may accompany some cases of GI lymphoma. Though ultrasonographically abnormal findings may suggest the presence of neoplasia, a normal appearance does NOT rule them out, especially for the stomach. Ultrasound can facilitate fine-needle aspirates or needle biopsy sample collection for cytologic or histologic analysis. Aspirated samples are also suitable for flow cytometric characterization for lymphomas.



Thoracic Imaging

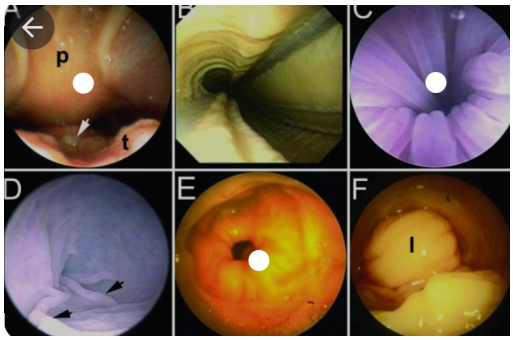
Though NOT commonly reported for canine & feline GI neoplasm, thoracic imaging such as 3-view radiographs and/or computed tomography can reveal pulmonary metastasis.
Such staging tests are important to determine prognosis, especially when surgery is being considered.





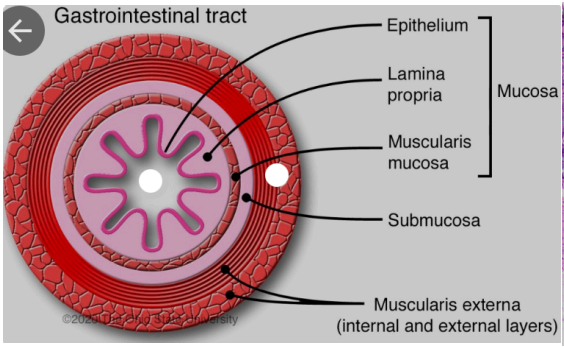
Endoscopy

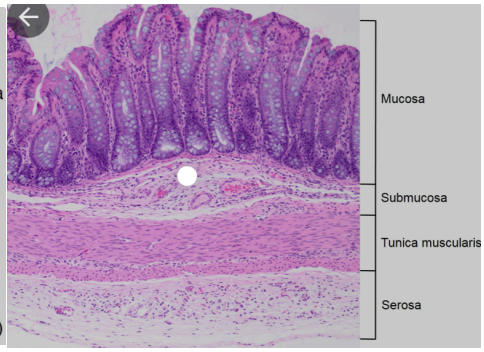
Endoscopy of the GI tract can facilitate identification & partial-thickness biopsy of GI neoplasia. However, endoscopic biopsy collection is limited by the small size & superficial nature of the biopsy, because some GI tumors are submucosal & this technique may only collect superficial mucosa.



Histologic & Molecular Diagnosis

In addition to histopathology, immunohistochemistry may be required to differentiate between types of neoplasia for GI biopsies. PCR for antigen receptor rearrangement (PARR) detects clonally rearranged antigen receptor genes by amplification of conserved gene segments & can aid in the diagnosis of GI lymphoma when performed on inconclusive biopsy sections, especially in cats. Sensitivity of PARR can be as high as 76% for the diagnosis of canine GI lymphoma.

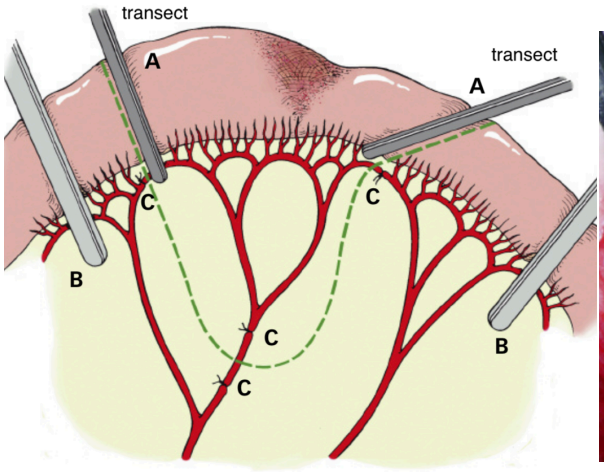


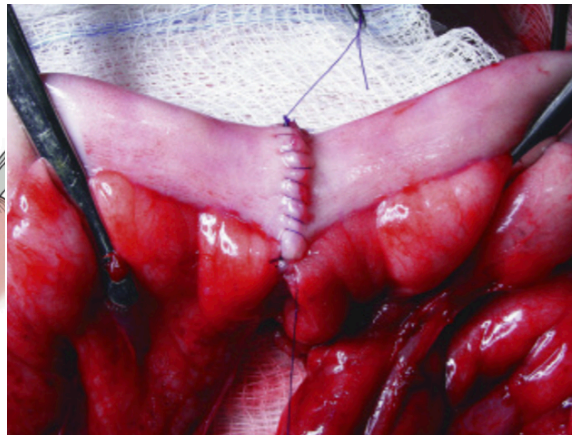


TREATMENT

Surgery

Surgical excision of the tumor is the gold standard for non-metastatic, non-lymphomatous neoplasms, though it can be also performed as palliative care in cases of mechanical ileus secondary to an obstructive mass, even if metastatic disease is confirmed. Curative resection, with margins of ≥4 cm, should be attempted. Careful preoperative discussion is needed before surgery because the perioperative mortality rate is reportedly as high as 50% in cats with intestinal carcinoma. In cats with splenic mast cell tumor (MCT) with intestinal involvement, splenectomy may also improve the outcome.





Adenocarcinoma

Prognosis of dogs with GI adenocarcinoma varies depending on the tumor location. Most dogs with gastric adenocarcinoma succumb to the disease within 6 months after surgery. Median survival times of small-intestinal adenocarcinoma in dogs is reported as 4–18 months, with a 1-year survival rate of 40%–60%. On the other hand, dogs with colorectal adenocarcinoma typically have a favorable prognosis, with a median survival time of 2–4 years after surgery.
Effective chemotherapy for treatment of GI adenocarcinoma has NOT been established.
Use of adjuvant carboplatin, doxorubicin or gemcitabine, although efficacy is unknown.

Feline Carcinoma

In contrast, prognosis of feline GI adenocarcinoma is poor regardless of tumor location. For cats that survived to discharge after surgery, reported mean survival ranges from 5 to 15 months for small intestinal carcinomas & from 5 to 9 months for large-intestinal carcinomas with or without adjuvant chemotherapy.

Canine Sarcoma

Dogs with GIST or leiomyosarcoma without gross metastasis tend to have a long remission time if the tumor is surgically resectable. In a study of leiomyosarcoma & GIST, overall median survival time was 37 months after complete resection.

Lymphoma

GI lymphoma is typically treated with chemotherapy. Poorly differentiated, high-grade GI lymphoma is poorly responsive to chemotherapy. If treatment is attempted, a multi-drug chemotherapy protocol (eg, Wisconsin-Madison) is recommended, but median survival time is usually <3 months, though the initial remission rate can be as high as 80%. Large-intestinal lymphoma in dogs is an exception, with median survival times of 5.5–6 years reported after systemic chemotherapy with or without surgical removal of the tumor. Focal lymphoma may be surgically excised & follow-up chemotherapy may be recommended.

Small-cell (well-differentiated, low-grade) lymphoma is treated with steroids & alkylating agents. Commonly used protocols include prednisolone & chlorambucil with reported median survival times of 2–3 years in cats & 14–21 months in dogs.

For patients with GI lymphoma confined to the abdominal cavity, radiation therapy may be effective, because most lymphomas are radiosensitive.

Malignant GI neoplasms are associated with a poor prognosis (survival <6 months), even with surgical & medical therapy.

Benign lesions, such as leiomyomas & colorectal adenomas, have a good prognosis with surgical excision.

AFTERCARE & OUTCOME

The leakage of intestinal contents into the abdomen & subsequent sepsis & peritonitis is always a risk during intestinal surgery, although meticulous care & adequate flushing of the abdomen usually prevent these. Dehiscence can occur at the site of bowel surgery or at the closure of the abdominal wall.

NOCITA: 3 day long lasting slow release bupivacaine intra-OP surgery injection was given to help with local surgical. Pain medications should be tailor to the lowest effective amount especially for the first 3 days then taper the dosage up as indicated. Observe for vocalization, biting or licking at the surgical site, anxiety &/or lethargy.

A Primapore adhesive band aid was applied to the surgical site with antibiotic ointment to help prevent self-trauma & infection. Skin glue was applied to the edges to allow the Primapore to adhere to the skin for about 5-7 days. Allow the Primapore to fall off naturally unless it is dirty or soil or wet then please remove earlier; however, by forcing the adhesive off early it may cause skin irritation or inflammation.

E-Collar should always be on for a minimal of 10-14 days until the skin incision is completely healed. The only time that the E-Collar may come off is during direct adult supervision otherwise please keep the E-Collar on to prevent self-trauma to the incision site & infection.

Activity restriction is recommended for minimal of 10-14 days until the skin incision is completely healed. Absolutely no running, jumping, jogging, playing, or using stairs what so ever. Increase activity may increase the chances of post-operative incision complications such as seroma (fluid filled pocket at the incision site), increase incisional inflammation, incision wound opening, delayed incision site healing & infection.

Medications will be discussed with your primary veterinarian & staff. Please make sure you understand what the medications are, how to give, how frequent to give & the potential side effects.

Diet options after this surgical procedure include prescription GI diet. Ok to give 1/4 to 1/2 the amount of recommended prescription GI diet the night of surgery is ok (~4-6 hours after surgery) if your pet is willing to eat. It is important that we make sure to feed your pet to allow for proper nutrition for the GI tract cells to heal. It is a good prognosis if your pet eats well & keep the food down without vomiting or diarrhea.

If possible 24 hour aftercare is always recommended in case if the recovery after surgery is NOT smooth or routine. Please if 24 hour aftercare is NOT possible then make sure to know what signs to look for while your pet is in your care that you have map out the nearest location of a 24 hour veterinary ER hospital / clinic & their phone number.

If you have any questions, please feel free to ask your primary veterinarian &/or veterinary surgeon.

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