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WHAT’S NEW IN ALIMENTARY NEOPLASIA?

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Introduction

The aim of this presentation is to review the major neoplastic diseases affecting the alimentary tract of the dog and cat [1] and indicate new information on the pathogenesis of these diseases.

Oral Neoplasia

A range of benign and malignant neoplasms may arise within the oral cavity. Although these are significant entities in companion animals they will not be discussed in detail. These tumours include:

• ameloblastoma
• keratinizing ameloblastoma
• amyloid-producing odontogenic tumour
• acanthomatous ameloblastoma
• fibromatous epulis of periodontal ligament origin
• feline inductive odontogenic tumour
• oral papillomata
• squamous cell carcinoma
• malignant melanoma
• fibrosarcoma
• lymphoma
• mast cell tumours

Oesophageal Neoplasia

Oesophageal neoplasia is uncommon in dogs and cats, and of reported tumours, squamous cell carcinoma (SCC) is most frequent. Most affected animals are older (dogs 6 – 11 y, cats 10 – 12 y) and in both species the tumour most often arises in the mid-oesophagus. The tumour presents as an ulcerated plaque that becomes circumferential. The microscopic appearance is of infiltrating cords and nests of pleomorphic and mitotic, squamous epithelium with focal keratinization ('keratin pearls') within a scirrhous matrix with a marked inflammatory component related to ulceration. Oesophageal SCC is locally infiltrative (e.g. of trachea) and may
metastasize to regional lymph nodes. Oesophageal adenocarcinoma, leiomyoma/sarcoma and GIST (see below) are rare. In endemic areas, oesophageal sarcomata (fibrosarcoma, osteosarcoma) initiated by Spirocerca lupi infection may be common [2].

**Gastric Neoplasia**

Non-lymphoid gastric neoplasia is not uncommon in the dog but very rare in the cat. Adenocarcinoma is more frequent than adenoma and the latter lesion may form a spectrum with benign adenomatous polyp [3]. Canine gastric adenocarcinoma has a mean age at presentation of 7 -10 y and breed predispositions have been suggested. The tumours most often arise from the antrum or body and may appear as plaques, polypoid masses or diffuse infiltrates. Mucosal ulceration is common and gastric perforation with omental adhesion may occur. The most common histological appearance is of deeply infiltrative, tubular to acinar growth, within a scirrhous matrix. Some tumour cells have extensive cytoplasmic vacuolation with the formation of ‘mucin lakes’ following rupture. In some tumours, vacuolated ‘signet ring’ cells containing mucin are prominent. In the absence of glandular differentiation, the tumour may be described as undifferentiated carcinoma and immunohistochemical expression of cytokeratin, EMA, CEA and CAM5.2 is to be expected. Canine gastric adenocarcinoma may spread to regional lymph nodes and seed the abdominal cavity but rarely metastasizes to other viscera or the lung.

Canine gastric **leiomyoma and leiomyosarcoma** are uncommon. Leiomyoma may remain undetected until late in life (mean age 16 y) but leiomyosarcoma is recognized earlier (mean age 7 y). The tumours arise most often from the gastro-oesophageal junction. The tumours appear amenable to surgical excision and are slow to metastasize.

**Alimentary lymphoma** (see below) may involve the stomach of dogs and cats but primary gastric lymphoma is considered rare. A recent study has provided evidence that feline gastric lymphoma may be associated with Helicobacter infection, akin to human gastric MALT lymphoma. Gastric **plasmacytoma** is rare in the dog.

**Intestinal Neoplasia**

The most common benign transformation in the canine intestine is the recto-anal polyp (rectal papillary adenoma). These occur in middle-aged dogs (mean 7 y) without clear breed predisposition. The histological growth is papillary or tubular and invasion of the sub-mucosa is uncommon. There is some evidence that these lesions may progress to malignancy.

Both **adenoma and adenocarcinoma** may be more common in the canine colon than the small intestine. The mean age of onset for all canine intestinal epithelial neoplasia is around 9 y. Intestinal adenomas may be polypoid whereas malignant variants are more likely to grow as plaques or by diffuse circumferential infiltration in an ‘annular stenosing’ fashion. The microscopic pattern of intestinal **adenocarcinoma** is as described above. These tumours are infiltrative and may extend to the serosa and mesentry and metastasize to local lymph nodes. Intra-abdominal seeding or distant vascular metastasis is rare. Feline intestinal adenocarcinoma is more common than benign epithelial neoplasia. There is a suggested breed predisposition for the Siamese cat and a mean age of 11 y is reported. There is no known association with retrovirus infection. These tumours most commonly arise in the jejunum or ileum and are rare in duodenum. The gross appearance is of an annular stenosing lesion and the histological appearance is as described for the dog. Feline intestinal adenocarcinoma is metastatic to lymph nodes and may seed the abdominal cavity leading to ascites.

Intestinal **carcinoid** is a rare tumour of the dog and cat that arises from neuroendocrine cells of the mucosa.
The canine tumours are more frequent in the colon, rectum and duodenum, whereas feline carcinoids are most often ileal in origin. In both species the age range for these tumours is 9 – 13 y. The growth is either annular stenosing or nodular and the histological appearance is of nests of cells with granular cytoplasm separated by connective tissue septae. On immunohistochemistry (IHC) these tumours express synaptophysin and chromagranin. The biological behaviour is for local infiltration (to mesentery), lymph node metastasis and potential vascular metastasis to liver.

Relatively uncommon tumours of the intestine include haemangiosarcoma (cat) and fibrosarcoma (dog and cat). Smooth muscle tumours are more common in the dog than the cat. Both leiomyoma and leiomyosarcoma are reported in dogs with an average age of 10 y. The site of origin of the tumours (collectively) is more frequently the jejunum and caecum than other intestinal sites. Feline leiomyoma and leiomyosarcoma are also more often small intestinal. The tumours are often nodular, involving the ante-mesenteric border. The histological distinction between benign and malignant tumours is difficult. On IHC these tumours express vimentin, desmin, muscle-specific actin (also found in skeletal muscle) and alpha-smooth muscle actin. Metastatic spread to lymph nodes and liver is a relatively uncommon occurrence.

Another tumour within this spectrum is the gastro-intestinal stromal tumour (GIST) which is histologically similar to the smooth muscle neoplasms but is thought to arise from the interstitial cells of Cajal (precursors to ‘pacemaker cells’ of the intestine). GIST may be distinguished by IHC expression of neurological markers (in some cases) such as S100, or markers such as NSE, synaptophysin, c-kit (CD117) or CD34 [4].

Alimentary lymphoma (AL) is recognized in both the dog and cat. These tumours may be localized or involve multiple levels of the alimentary tract. They may be nodular, plaque-like, circumferential or diffuse in growth. There is secondary involvement of mesenteric lymph nodes and abdominal viscera. IHC or determination of molecular clonality may be used to define the tumours as of T-cell (some epitheliotropic), B-cell or null-cell origin. AL is the most common feline intestinal neoplasm and the most common presentation of lymphoma in this species [5]. Affected cats are generally older and have no evidence of retrovirus infection. There is a well-documented association with pre-existing lymphoplasmacytic inflammation and the histological distinction between inflammatory bowel disease (IBD) and AL is a diagnostic challenge in the cat. The jejunum and ileo-caeco-colic junction are more commonly affected than duodenum, colon and stomach. Two major histological variants are recognized. Small cell lymphocytic villus lymphoma is a T-cell lesion that arises at the base of the villus in older cats. Large cell (lymphoblastic) lymphoma affects any age of cat and is a more aggressive and metastatic tumour that is often of B-cell origin [6]. AL is less common than multicentric lymphoma in the dog and is less common than intestinal epithelial neoplasia. The small intestine is involved more frequently than the large intestine or stomach. Although less often recognized than in the cat, an association with IBD is also proposed in some dogs. T-cell tumours predominate.

Other, less common, intestinal round-cell tumours include plasmacytoma (dog), mast cell tumour (cat more than dog) and the distinctive tumours of feline globular leucocytes that have immunohistochemical features consistent with a cytotoxic, intra-epithelial T-cell lineage.

References


