Intestinal Mucinous Adenocarcinoma with Lymph Node Metastasis in a Cat

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Abstract: Intestinal adenocarcinoma is a malignant tumor. The most common clinical signs of gastrointestinal adenocarcinoma are depression, anorexia, loss of weight, vomiting, diarrhea or constipation due to obstruction. In cats, gastrointestinal adenocarcinomas are the most common non-hematopoietic gastrointestinal tumors and their frequency is higher in males. In this report, the case of an 8 year old male cat with adenocarcinoma that had metastasized to the lymph nodes is presented.

Keywords: Adenocarcinoma, Cat, Metastases

Introduction

Intestinal tumours are uncommon in cats, accounting for about 1% of all malignant feline neoplasms. Adenocarcinomas are the most common type of feline intestinal neoplasm (52%), followed by lymphosarcoma (21%) (Rivers et al., 1997).

Adenocarcinomas are malignant tumors of the glandular epithelium that differentiate from the crypts of Lieberkuhn and spread through the intramural or submucosal lymphatics. These tumors are considered highly malignant, with frequent metastasis to the regional lymph nodes (Prater et al., 1999; Theilen and Madewell, 1979).

Gastrointestinal adenocarcinomas are the most frequently detected nonhematopoietic gastrointestinal tumors in cats (Turk et al., 1981). They can be seen in all segments of intestine but the ileum is the commonest site, where as adenocarcinoma is generally detected in the colon and duodenum of dogs (Patnaik et al., 1976).

The most frequent symptoms of gastrointestinal adenocarcinoma are lethargy, anorexia, loss of weight from 5 days to 6 months, vomiting, diarrhea and constipation (Patnaik et al., 1976).

Adenocarcinoma can cause partial or complete obstruction of the intestine (Head and Else, 1981). Obstructions can be seen in direct and indirect radiography after the administration of barium. A swollen, fluid-filled abdomen and palpable mass can occur as well (Patnaik et al., 1976). The tumors are often firm and white at the cut surface (Head and Else, 1981).
In the direct radiography, the stomach, duodenum and proximal part of jejunum were enlarged Fig. 1 and the intestine was empty. In the contrast radiography with barium sulphate, at 0, 15, 30, 45, 60, 120, 180 min and 24 h, the contrast substance had moved just into the duodenum but no further.

In the ultrasonographic examination, the stomach was enlarged and full of fluid. Although the fluid was moving from the stomach to the duodenum, it couldn’t pass on to the other parts of the intestine. In addition, thickening of the intestinal wall was detected.

Surgical intervention was deemed necessary. Laparotomy was performed on the cat under general anesthesia. The air and fluid was removed from the stomach and the internal surface of the stomach and intestine were checked for blockage. A mass which was solid but flexible was detected in the proximal part of the jejunum. It was 2.5-3 cm in length Fig. 2a and 2b. After the mass was totally removed and the peripheral lymph nodes, endwise anastomosis was performed.

Despite the full routine of intensive therapy for three days post-surgery, the patient deceased.

The intestinal mass and mesenteric lymph nodes were fixed in 10% neutral buffered formalin, embedded in paraffin wax, sliced at 5 µm intervals and stained with Hematoxylin-Eosin (HE) and Toluidin Blue (TB).

Microscopically, the tumor mass composed of neoplastic cells characterized by small acini and solid groups that produced mucin and infiltrated throughout the intestinal wall. There were scattered single cells and small groups of tumor cells that were mostly cubical or columnar, but many signet ring cells were also visible. Large extracellular mucin lakes replaced the normal intestinal tissues, especially in the muscular layer and mesentery. Some neoplastic cells showing signet ring characteristics had dark nuclei that were pushed to the cell periphery by mucin and showed many mitotic figures. Tumor cell emboli were seen in many lymphatic vessels and venules. There were necrotic changes in some areas of intestinal wall. The regional lymph node exhibited extensively metastasis showing microscopic features similar to those of the primary sites Fig. 3.

At the end of the pathological examination, adenocarcinoma was diagnosed in the mass and its peripheral lymph nodes.

Fig. 1. Direct radiographic appearance, obstruction area (long arrow) in ileum and enlarged stomach (short arrow)

Fig. 2a and b Appearance of the mass which was detected in the proximal part of the jejunum

Fig. 3. Image 1 (A) Tumor cell infiltrations extending from the submucosa to the muscle layer (areas indicated by arrows) and normal intestinal mucosa (M). X 60, HE. (B) Neoplastic cells showing the typical “signet ring” feature with a dark-colored nucleus that was pushed to the periphery by the pressure of mucin in the cytoplasm between the muscle layers. X320, HE. (C) Embolism of the tumor cells in a lymphatic vessel. X60, HE. (D) Metastatic tumor cells in a mesenterial lymph node (arrows) and normal lymphoid follicles (L). X180, HE. (E) TB-positive tumor cells invading the intestinal wall (T) and goblet cells in normal intestinal mucosa. X60, TB stain
Discussion and Conclusion

Intestinal adenocarcinoma occurs more rarely in cats than in humans and dogs. The frequency is higher in male cats than in females. Siamese and short hairdomestic cats are affected more than the other breeds. The mean age for the occurrence of intestinal adenocarcinoma is 11 years (5-17 years) (Patnaik et al., 1976; Cribb, 1988). The cat in our case was eight years old, male and a short hair domestic breed. These characteristics put our patient in the high risk category for adenocarcinoma.

Cats with adenocarcinoma have usually had a long history of non-specific gastrointestinal disease symptoms such as weight loss and vomiting (Cribb, 1988). According to the reported cases, weight loss, anorexia, lethargy, vomiting, diarrhea or constipation are the predominant clinical signs of intestinal adenocarcinoma (Patnaik et al., 1976). The cat that is the subject of this case study had a number of these symptoms.

Abdominal radiography is helpful in diagnosing intestinal obstruction (Kosovsky et al., 1988). In indirect radiography, the contrast substance moved as far as the duodenum. The obstruction was subsequently determined with ultrasonographic examination to be in the jejunum region.

After intestinal resection and anastomosis, median survival time was reported to be only 2.5 months in cats (range: 0-24 months) (Cribb, 1988). That description covers the presented case.

The distribution of adenocarcinomas in the gastrointestinal tract was reported as: Stomach (1%); small intestine (68%) (11%) exact location not specified; duodenum (6%); jejunum (20%); ileum (31%); ileocolic junction (9%); cecum (2%); colon (13%); rectum (6%); and unknown (5%) (Cribb, 1988).

In this case study, the mass was detected in the proximal part of the jejunum. The small intestine seems to be the most frequent location of gastrointestinal adenocarcinomain cats; the jejunum, ileum and ileoceccolic junctions are the most commonly affected sites (Kosovsky et al., 1988).

In cats, adenocarcinoma metastasised to the regional lymph nodes 45 and 50% of these occurred in the peritoneum or omentum; 8% were in the lungs; and 9% were in the abdominal organs, including the liver and spleen (Cribb, 1988). Metastasis to the regional lymph nodes also occurred in the cat in our study.

Adenocarcinomas can be classified into four histologically distinct groups, namely (1) carcinoma with solid groups of cells, (2) adenocarcinoma with solid and acinar cells, (3) papillary adenocarcinoma and (4) mucinous adenocarcinoma (Patnaik et al., 1976). After the histopathological evaluation of the mass in our case, it was identified as a mucinous adenocarcinoma.

In conclusion, differential diagnosis is very important in cats with non-specific gastrointestinal symptoms. Veterinary clinicians should consider adenocarcinoma in cats with a long history of chronic gastrointestinal complaints such as symptoms that can include anorexia, lethargy, weight loss, vomiting and constipation.

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Author’s Contributions

Handan Hilal Arslan: Participated in all clinical, stages, coordinated the data-analysis and contributed to the writing of the manuscript.

Hatice Ozlem Nisbet: Participated in all experiments, the data-analysis and contributed to the writing of the manuscript.

Efe Karaca: Contributed to the pathological investigation and writing of the manuscript.

Birsen Deniz Özbakır: Contributed to the clinical process.

Ishtiaq Ahmed: Contributed to the pathological investigation and writing of the manuscript.

Emre Kulluk: Contributed to the writing of the manuscript.

Ethics

Ethics approval was not necessary. All recovery and evaluation process have done in routine clinical practice.

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