

## Case Report

# Long-Term Survival in a Cat with Pancreatic Carcinoma and Splenic Involvement after Surgical Excision

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A thirteen-year-old female spayed with a history of hydronephrosis was presented for a routine abdominal ultrasonographic exam. The imaging exam showed a mass involving the pancreas and a large mass affecting the spleen. Exploratory laparotomy evidenced a mass in the pancreas and another involving one-third of the spleen. The patient had partial pancreatectomy and splenectomy. The histopathology report came back with a diagnosis of pancreatic carcinoma. Adjuvant chemotherapy was declined. The cat is still free of gross tumor recurrence and metastatic disease after twenty-six months. Early diagnosed and aggressively treated feline pancreatic carcinoma might yield a favorable prognosis.

## 1. Introduction

Exocrine pancreatic neoplasia has been infrequently described in the cat and is almost always of malignant nature, being a carcinoma or an adenocarcinoma of ductal or acinar origin [1–5]. This neoplasm usually affects aged feline individuals that are older than 10 years. The clinical signs of this tumor are quite unspecific: weight loss, depression, anorexia, paraneoplastic alopecia, steatitis, abdominal effusion secondary to peritoneal carcinomatosis of pancreatic origin, and, rarely, diabetes mellitus [1–11].

The hematological and biochemical analyses of these patients show nonspecific alterations such as mild anemia, mild thrombocytopenia, leukocytosis, hyperglycemia, bilirubinemia, and mild elevation of amylase, lipase, aspartate aminotransferase, and alanine aminotransferase [1–11]. In several patients, ultrasonographic exam of the abdomen has been instrumental to document the presence of neoplastic ascites or to identify the presence of nodular lesions to the pancreas, liver, spleen, abdominal lymph nodes, and omentum [1, 6, 7, 12, 13].

In a series of 14 cats with pancreatic neoplasia, (11 out of 14 affected by pancreatic carcinoma/adenocarcinoma), the most commonly reported ultrasonographic finding was a focal pancreatic mass or nodule, with a size ranging

from 0.4 cm to more than 7.0 cm (8/14) [13]. Moreover, in the same article lymphadenopathy (7/14) and abdominal effusion (7/14) were frequently described [13]. Despite the aid provided by diagnostic imaging, the final diagnosis of pancreatic neoplasia has not been made prior to exploratory laparotomy or necropsy in most of the cases reported in the literature [1, 3–9]. The prognosis for cats with pancreatic carcinoma is dismal; most patients are euthanized or die shortly after the final diagnosis is reached, due to the advanced stage of the disease, and a one year survival has not been reported [1–9].

## 2. Case Report

A thirteen-year-old female spayed domestic shorthair cat was presented for a routine ultrasonographic examination of the urinary system. Five years prior, the patient had experienced a bilateral hydronephrosis secondary to sterile inflammation of the ureters that subsided after successful treatment of the ureteritis with nonsteroidal anti-inflammatory drug (meloxicam). Since then the owner elected the cat to have routine ultrasonographic abdominal exam three times a year. At presentation the cat was bright, alert, and responsive; the clinical examination of the patient did not show any abnormalities. Ultrasonographic exam of the abdomen

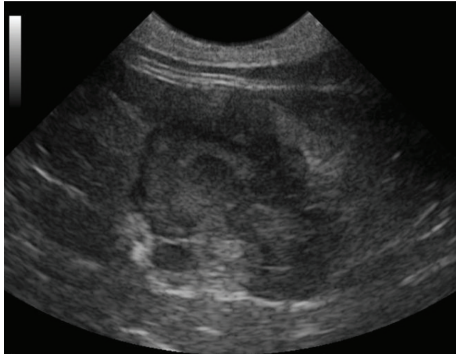


FIGURE 1: Ultrasonographic appearance of the pancreatic lesion: the ultrasonogram shows a hypoechoic mass containing hyperechoic and hypoechoic areas.

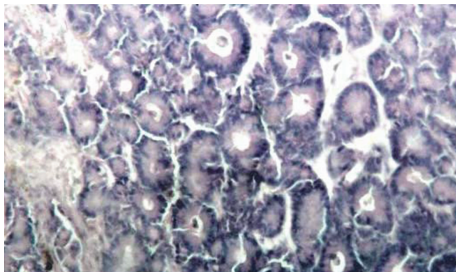


FIGURE 2: The histopathological appearance of the tumor in the pancreas. Hematoxylin-eosin original magnification  $\times 20$ .

evidenced a mass affecting the pancreas, however, was unable to exactly assess its location (pancreatic body versus limb) (Figure 1). The owner elected exploratory laparotomy rather than performing fine needle aspiration biopsy, in order to prevent tumor seeding. Preoperative complete blood cell count, biochemical profile, urinalysis, and coagulation profile were within normal limits. Exploratory laparotomy was performed, and a 5 cm pancreatic mass was evidenced in the caudal end of the right lobe of the pancreas. Moreover, multiple focal splenic nodules that were not evidenced during the ultrasonographic exam were palpated within the splenic parenchyma. The other abdominal organs were examined by the surgeons and did not show gross alterations. Partial pancreatectomy was carried out and the half of the pancreas harboring the mass was removed together with the spleen; moreover, at that time regional lymph nodes were biopsied as well. The patient was hospitalized for two days and treated with intravenous antibiotics and fluids then discharged on oral antibiotics and scheduled for a recheck appointment in 10 days for suture removal. The histopathology report came back with a diagnosis of well-differentiated pancreatic carcinoma with splenic dissemination. The tumor was characterized by a proliferation of small tubular structures lined by cuboidal cells within abundant desmoplastic stroma (Figure 2). The biopsy of the regional lymph nodes did not show metastatic spread (not shown).

The cat was checked for signs of exocrine pancreatic insufficiency and showed to have a normal pancreatic activity; moreover, clinical signs of the pathology were not

noticed by the owner. Due to the grave prognosis of the disease and the unrewarding results of chemotherapy in veterinary patients with pancreatic malignant neoplasia, the owner declined additional treatments, also in consideration of possible chemotherapy-induced renal toxicity [14]. At this point, it was suggested to have the cat monthly monitored for metastatic spread and for signs of pancreatic insufficiency through ultrasonography of the abdomen, chest radiographs and hematological and biochemical analysis. After one year without evidence of tumor recurrence, the owner elected to have a total body computed tomography of the cat that failed to show any sign of metastatic condition. The cat is still disease-free after 26 months from its surgery and is being monitored on a every-three-months basis.

### 3. Discussion

Malignant exocrine neoplasia of the pancreas is a disease that carries a grave prognosis in feline patients, probably due to its delayed discovery by owners and clinicians, with a survival time that is often measured in weeks [1–9, 14]. In fact, by the time a diagnosis is achieved, the tumor has already spread to several organs, leading to severe clinical signs in most cats. Chemotherapy and radiation therapy are usually not offered in consideration of the limited response to them by pancreatic carcinoma/adenocarcinoma.

In this paper we report the long-term survival of a cat with metastatic carcinoma that had already spread to the spleen. The reason of this extended disease-free interval could be in the incidental discovery of the disease in an asymptomatic patient, prior to massive dissemination as per the literature.

Moreover, the location of the neoplasm in the tail of the pancreas facilitated the surgical excision, preventing the need for a total pancreatectomy or pancreaticoduodenectomy, procedure that, so far, has been limited to laboratory animals and humans and is associated with significant morbidity and mortality [14]. Finally, a potential role of the reactivation of the immune system after surgical removal of the gross disease in a patient without lymph node involvement, as described in humans, cannot completely be ruled out [15]. In conclusion, the prognosis for pancreatic carcinoma in cats may not be as dismal as previously reported, especially for selected cases with early diagnosis.

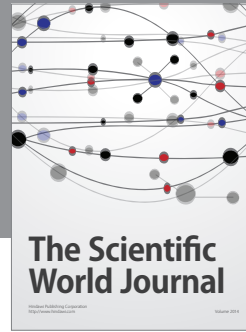
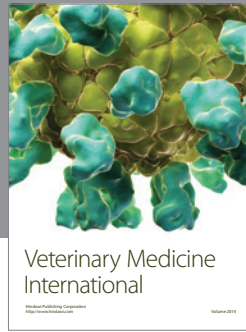
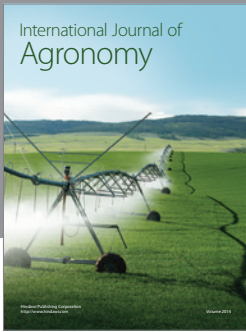
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