

# Feline Pancreatitis – A Diagnostic Challenge

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## Introduction

Feline pancreatitis can be a very difficult disease to diagnose as there are rarely any localising clinical signs and unlike dogs, there are no specific diagnostic tests. Pancreatitis is a disease of the exocrine pancreas.

## Pathophysiology

The anatomy of the feline pancreas varies from dogs in that the pancreatic duct opens with the bile duct at the major duodenal papilla. This is significant when assessing laboratory findings and preparing a list of differential diagnoses for your cat. Pancreatic enzymes are released following secretin (food in the small intestine) and cholecystokinin (proteolytic enzyme and bicarbonate release) secretion.

Pancreatitis results from the failure of the normal protective mechanisms in the pancreas. (1) Pancreatic zymogens are not activated until they enter the duodenum and are activated by enterokinase (2000 times more effective than trypsin in activating zymogens); (2) Within the pancreas zymogens and lysosomes are separated by intracytoplasmic membranes; (3) Trypsin inhibitors inactivate prematurely activated free trypsin (4) Plasma antiproteases. When these mechanisms fail trypsin can become activated within the pancreas that can then activate other zymogens.

Trypsinogen may be activated by the pancreas when (1) zymogens and lysosomal enzymes co-localise within the pancreas; (2) lysosomal enzymes activate trypsinogen; (3) trypsinogen auto-activation occurs at pH 5.0; (4) in humans, a mutation in the trypsin gene results in trypsinogen auto-activation. These circulating proteases then activate the complement, fibrinogen, kinin and coagulation cascades resulting in DIC, sepsis and death. The degree of damage to the pancreas and activation of the systemic cascades is regulated by plasma protease inhibitors  $\alpha_1$ -antitrypsin and  $\alpha$ -macroglobulins.

Following the activation of pancreatitis the following complications may occur; diabetes mellitus, diabetic ketoacidosis, abscess/pseudocyst formation, cardiac arrhythmia's, abdominal distension, ileus, DIC, sepsis, bile duct obstruction, acute respiratory distress syndrome and renal failure. Later on the cat may develop exocrine pancreatic insufficiency or chronic relapsing pancreatitis.

## Prevalence

Recent studies have shown a prevalence of 3.5% at post-mortem and the disease is often only diagnosed at necropsy. Interestingly cats may have pancreatitis in conjunction with inflammatory bowel disease or cholangiohepatitis.

## Signalment and Clinical Signs

There is no age or sex predisposition. However, Siamese cats may have an increased incidence. Clinical signs are often vague.

**Presenting signs and clinical findings in cats with pancreatitis**

Sign	Frequency
Lethargy	100%
Anorexia	84%
Dehydration	77%
Hypothermia	68%
Vomiting	35%
Abdominal pain	25%
Abdominal mass	23%
Dyspnoea	20%
Diarrhoea	15%
Ataxia	15%

## Diagnosis

Cats with pancreatitis primarily present with lethargy, depression and anorexia making ante-mortem diagnosis difficult. They may have localising signs such as jaundice and abdominal pain.

Biochemistry may show the cat to have elevated liver enzymes (ALT, Alp and Bilirubin) and hypoglycaemia. Hypokalemia and hypocalcaemia may be present. The cat may be glycosuric. Amylase and lipase are not useful in cats.

Radiography may show loss of serosal detail, increased opacity in the right cranial quadrant, displacement of the duodenum ventral and possibly to the right and a dilated hypo-motile duodenum. All findings are non-specific.

Ultrasonography is useful. Common findings are an enlarged hypo-echoic pancreas, possible abscess/pseudocysts, dilated pancreatic duct, hypo-motile duodenum, bile duct dilation and free peritoneal fluid. Ultra sound is not very sensitive with only 35% of cats being diagnosed with pancreatitis.

Often an exploratory laparotomy is required to diagnose pancreatitis. It has the advantage that you can look for concurrent disease at the same time (cholangiohepatitis and IBD)

Overseas there has been some success using feline trypsin-like immuno-reactivity (fTLI). If fTLI is >49 µg/l it indicates pancreatitis (sensitivity 89% and specificity 86%). TLI may be elevated with both IBD and gastrointestinal lymphoma.

## Medical Management of Pancreatitis

It is important to maintain and restore adequate tissue perfusion. IV fluid therapy is important at rates to maintain tissue perfusion. Colloids can be useful and plasma is available, especially if the cat is hypoproteinaemic.

Insulin therapy (see Diabetic Ketoacidosis notes) should be commenced if the cat is hyperglycaemic (> 16 mmol/l) to prevent glucose toxicity and exhaustion of the endocrine pancreas and permanent diabetes mellitus. Most cats with diabetes mellitus and pancreatitis will be transient diabetics.

Antibiotics should be used – amoxicillin @ 20 mg/kg IV BID-TID and enrofloxacin @ 5 mg/kg SQ SID are a good combination.

Analgesia is important – buprenorphine 0.005-0.01 mg/kg SQ QID-BID or butorphanol CRI are good analgesics.

Treat coagulopathies with fresh blood and heparin @75-150 IU/kg TID.

Ensure that the cat is monitored for hyperglycaemia, sepsis, DIC, hypoproteinaemia and renal failure with regular haematology and biochemistry. It is important to be proactive and intervene before clinical signs become apparent, as cats will often die when clinical signs become obvious.

## **Nutritional Management**

Cats with pancreatitis have anorexia and weight loss. They rarely have vomiting and abdominal pain, which are common in dogs.

Fasting cats longer than 3 days may further compound their malnutrition and predisposes the cat to hepatic lipidosis. Remember these cats are often already malnourished on presentation.

An oesophagostomy tube or gastrotomy tube should be placed and nutrition commenced with a high quality feline diet (remember cats normal consume a high protein, low carbohydrate diet) Cats can be fed because they do not show signs such as vomiting and abdominal pain.

## **Summary**

The diagnosis of pancreatitis requires that the clinician has a high degree of suspicion because laboratory findings are non-specific. Ultrasound and exploratory laparotomy are the most sensitive diagnostic tests currently available.

Malnutrition is an important complication in feline pancreatitis, which requires aggressive treatment with nutritional support. This is in contrast to treatment of canine pancreatitis.

You should be aware of other complications and ensure they do not occur or worsen the prognosis. While feline pancreatitis can be challenging to diagnose and treat it carries a fair prognosis if treated correctly.

## **References and Suggested Reading**

Simpson, K.W. Pancreatitis in cats. Proceedings of the 21st Annual ACVIM forum, Charlotte, NC, 4-8 June 2003.

Mansfield, C.S. and Jones, B.R. Review of feline pancreatitis part one and two. J. Feline medicine and surgery 117-132 (3) 2001.