

A Case of Feline Pancreatitis

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ABSTRACT. A 14-year-old, spayed female, domestic shorthair cat was referred to us with anorexia, pyrexia, and jaundice. Total bilirubin (TBIL) and feline trypsin-like immunoreactivity (fTLI) levels were remarkably high. Based on laparoscopic biopsy of the pancreas, the cat was diagnosed as having pancreatitis. As a result of treatment with a synthetic protease inhibitor and corticosteroid, the TBIL and fTLI values returned to normal and the clinical course was good.

KEY WORDS: corticosteroid, feline pancreatitis, synthetic protease inhibitor.

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Feline pancreatitis is an uncommon disease in comparison with the canine version [2]. Nonspecific clinical and biochemical signs make this disease difficult to diagnose in cats [3, 7]. For a definitive diagnosis, biopsy of the pancreas is necessary, but this is invasive to the animals. Therefore, it is difficult to diagnose pancreatitis in live patients, and its pathogenesis and treatment are still unclear. This report deals with a feline case of pancreatitis diagnosed by histopathology of a laparoscopic biopsy specimen from the pancreas and successfully treated using a synthetic protease inhibitor and corticosteroid.

A 14-year-old, spayed female, domestic shorthair cat weighing 4.0 kg was referred to the Nihon University Animal Medical Center with a four-day history of anorexia and pyrexia. At the time of physical examination, the cat's body temperature was 38.5°C and jaundice was detected. There were no indications of abdominal pain by palpation. Complete blood counts showed increased numbers of white blood cells (WBC, 19,300/ μ l). Blood biochemistry revealed hyperbilirubinemia (TBIL, 7.2 mg/dl; reference range, 0 to 0.9 U/l) and a slightly increased lipase level (1466 U/l; reference range, 100 to 1400 U/l). The amylase and liver enzyme levels were within normal ranges, but the fasting serum bile acid (SBA) level was remarkably high (442.0 μ mol/l; reference range, 0 to 25.0 μ mol/l). Serum thyroxine (T4) was within the normal range (1.9 μ g/dl; reference range, 0.5 to 3.0 μ g/dl), and tests for feline immunodeficiency virus (FIV) and feline leukemia virus (FeLV) were negative. Urine analysis indicated bilirubinuria. Radiography and ultrasonography showed no abnormalities in the abdomen. Moreover, the serum feline trypsin-like immunoreactivity (fTLI) concentration was measured by ELISA as described previously [4]. The serum fTLI concentration was remarkably high (667 ng/ml; reference range, 12 to 82 ng/ml).

The cat was treated with intravenous fluid and antibiotics (cefazolin sodium, 20 mg/kg bid) for three days. However, the anorexia and jaundice continued, and blood chemical

abnormalities were detected including increased values of alkaline phosphatase (ALP, 132 U/l; reference range, 14 to 111 U/l), alanine aminotransferase (ALT, 141 U/l; reference range, 12 to 130 U/l), aspartate aminotransferase (AST, 83 U/l; reference range, 0 to 48 U/l) and gamma glutamyl transpeptidase (GGT, 27 U/l; reference range, 0 to 2 U/l). Therefore, laparoscopic examination and placement of a percutaneous endoscopic gastrostomy (PEG) tube were performed on day 3.

The cat was premedicated with midazolam (0.1 mg/kg, IV) and butorphanol (0.2 mg/kg, IV). Inhalation anesthesia with isoflurane was used following induction with isoflurane via face mask and intratracheal intubation. After anesthesia, the cat was positioned in left lateral recumbency and the abdominal cavity was insufflated with carbon dioxide. Two trocars (5 mm, Ethicon Endo-Surgery, OH, U.S.A.) were set in place, and a laparoscope (5 mm, Karl Struz, Germany) was used to visualize and explore the abdominal cavity. Laparoscopic findings showed that the pancreas was enlarged edematous and that a slight amount of yellowish ascites was present (Fig. 1A). The liver was tan in color with an accentuated lobular pattern (Fig. 1B). There were no unusual findings for the gallbladder or common bile duct. Biopsy samples of the pancreas and liver were obtained with cup biopsy forceps. Histopathologically, the pancreatic ducts were surrounded by moderate infiltration of lymphocytes and plasma cells, and the fat tissue around the pancreas had begun to degenerate (Fig. 2A). Mild infiltration of lymphocytes and plasma cells in the portal triads, hepatic lipid vacuole formation, and biliary ductile proliferation were detected (Fig. 2B). In addition, the results of bacterial examination of the ascites and tissues were negative. Based on these findings, this case was diagnosed as chronic interstitial pancreatitis with cholangitis / cholangiohepatitis.

A percutaneous endoscopic gastrostomy tube (PEG tube, Cook, Australia) was set into place under endoscopy after biopsy, and a synthetic protease inhibitor (gabexate mesilate, Ono Pharmaceutical Co., Ltd., Osaka, Japan) was

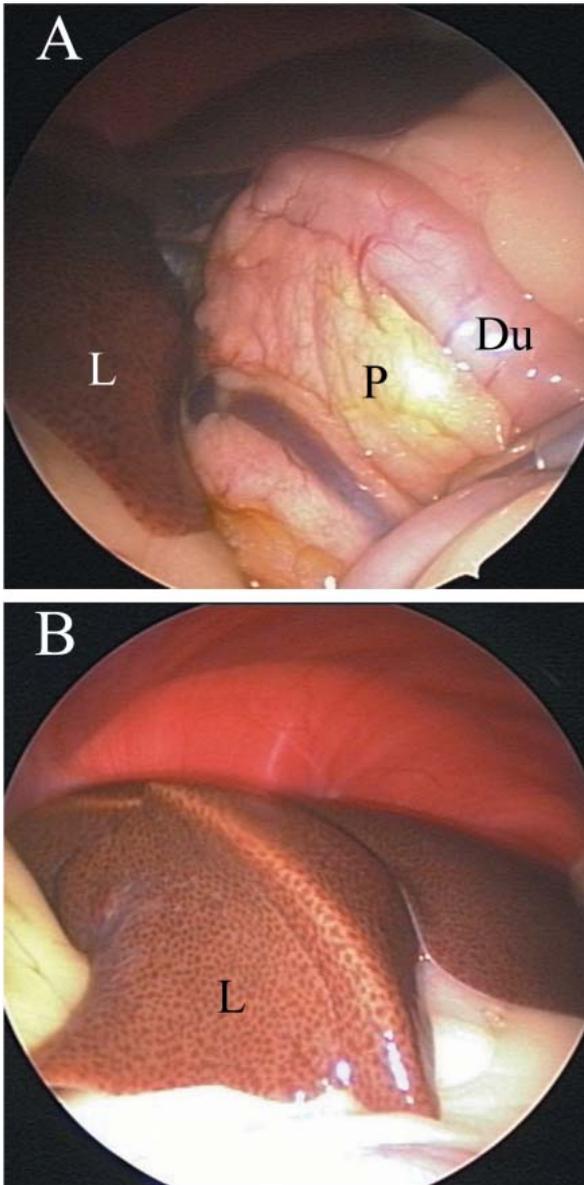


Fig. 1. Laparoscopic findings of the right limb of the pancreas (A) and liver (B) of the cat. P: pancreas. Du: duodenum. L: liver.

injected intravenously at 1 mg/kg/hr for three days. Twenty-four hours after placement of the PEG tube, treatment was started with prednisolone (1 mg/kg sid), amoxicillin (20 mg/kg bid), metronidazole (7.5 mg/kg bid) and ursodeoxycholic acid (5 mg/kg bid) via the tube. A mixture of Prescription Diet a/d (Hill's Colgate Ltd., Tokyo, Japan) and feline CliniCare (Abbott Animal Health, IL, U.S.A.) was given to the cat three times daily. After treatment, the cat's appetite gradually improved, and the total bilirubin level decreased to within the normal range on day 9 (Fig. 3). On day 13, the liver enzyme levels and SBA concentration returned to normal (ALP, 51 U/l; ALT, 29 U/l; AST, 0 U/l;

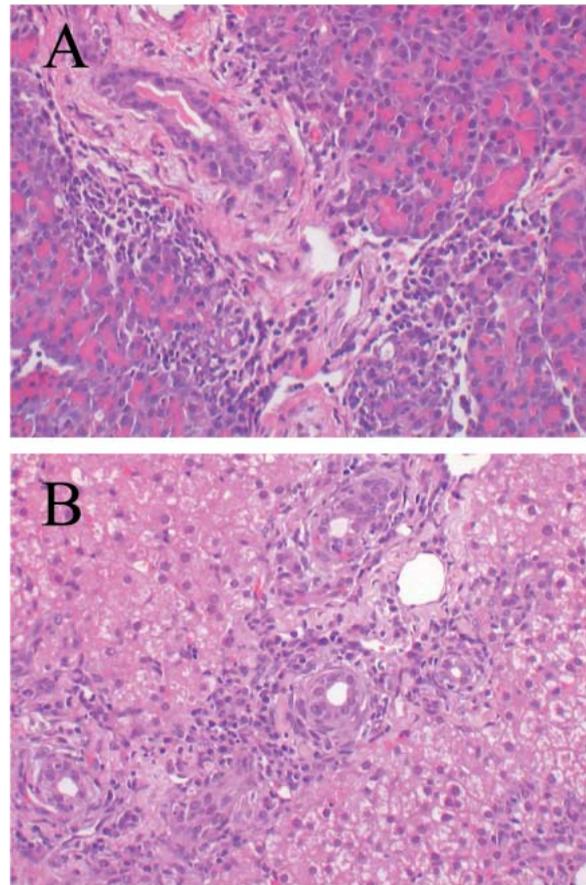


Fig. 2. Photomicrograph of pancreas (A) and liver (B) tissues from this case. Infiltration of lymphocytes was present. Hematoxylin and eosin. $\times 200$.

GGT, 2 U/l; fasting SBA, 2.6 $\mu\text{mol/l}$; postprandial SBA, 3.4 $\mu\text{mol/l}$), but the serum fTLI level was still high (151 ng/ml). Since pyrexia and leukocytosis were present intermittently, the antibiotic was changed to ofloxacin (5 mg/kg sid) and the dose of prednisolone was decreased to 0.5 mg/kg once a daily. On day 108, the cat's appetite was completely recovered and the PEG tube was removed. On day 148, the cat had no clinical abnormalities and a normal serum fTLI value (82 ng/ml), but it was still being given prednisolone (0.25 mg/kg sid, PO).

Treatment of feline pancreatitis is poorly defined in contrast to the canine version because it is difficult to diagnose based on specific clinical signs and laboratory tests [3, 7], although measurement of fTLI is effective for diagnosis of pancreatitis in the cat [5]. In this case, pancreatitis was suspected based on a remarkably increased fTLI value. The diagnosis was confirmed by pancreatic biopsy under laparoscopy. Laparoscopy is an effective method for evaluation of the pancreas in comparison with other imaging techniques. This technique is able to be used as a method of obtaining pancreas biopsy specimens and is generally free of complications in dogs [1]. Our case was diagnosed as

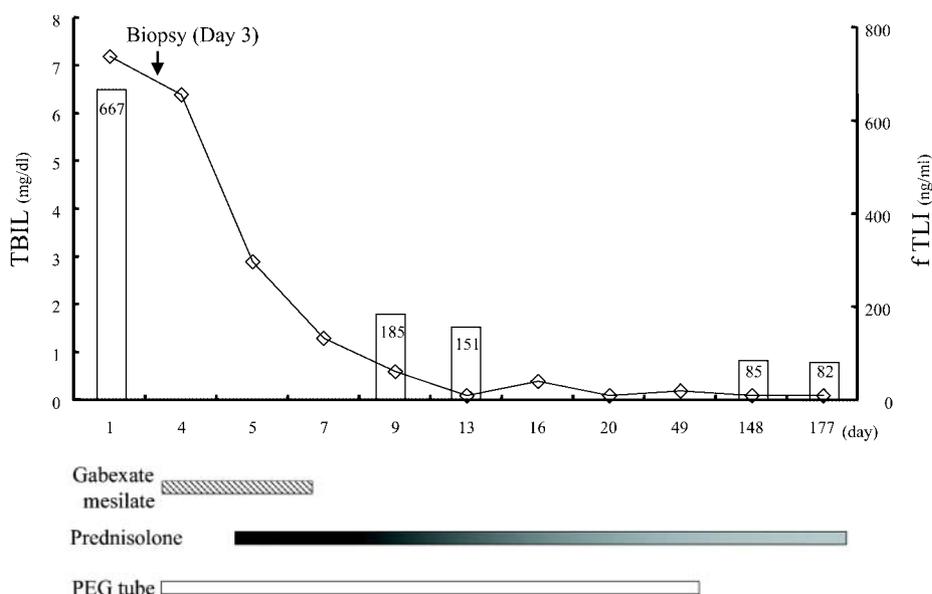


Fig. 3. Changes in total bilirubin (TBIL, open diamonds) and feline trypsin-like immunoreactivity (fTLI, open columns) level in a cat treated with synthetic protease inhibitor and corticosteroid.

chronic interstitial pancreatitis; the inflammatory type of chronic interstitial pancreatitis has been reported in cats [3, 7]. We believe that the severe jaundice may have been due to extrahepatic bile duct obstruction as a result of pancreatic inflammation.

Gabexate mesilate, a synthetic protease inhibitor, was administered to the cat by continuous IV injection. This drug inhibits the functions of thrombin, plasmin, kallikrein, trypsin, and neutrophil elastase and is used to treat pancreatitis and intravascular coagulation syndrome (DIC) in humans. In an experiment in dogs, gabexate mesilate was proven to be effective for pancreatitis [4]. However, there are no clinical reports in veterinary medicine. Since the bilirubin levels of the cat decreased rapidly after gabexate mesilate injection, these injections may control inflammation in the pancreas local field during the early stage.

Prednisolone was administered to our case because lymphocytes had infiltrated in pancreas, although the results of bacterial examination were negative. In addition, the cholangitis/cholangiohepatitis was confirmed by liver biopsy in this cat. Feline pancreatitis is often accompanied by cholangitis/cholangiohepatitis and inflammatory bowel disease [6]. Corticosteroid is also effective for these diseases. Corticosteroid is suspected to induce or worsen pancreatitis, but there were no adverse effects in our case.

It has been reported that a case of feline pancreatitis was successfully treated using an endoscopically placed gastrojejunostomy (PEG-J) tube [2]. We performed alimentary support via a PEG tube after laparoscopic examination in

order to avoid development of hepatic lipidosis. PEG tubes are easy to set into place in comparison with PEG-J tubes and can be used for long periods of time. Therefore we were able to treat the cat with a diet and medication over the long term without placing stress on the animal.

In conclusion, feline pancreatitis can be diagnosed by measurement of fTLI and laparoscopic pancreas biopsy and may be successfully treated with gabexate mesilate and prednisolone. These medications and establishment of a PEG tube are also effective for long-term management of feline pancreatitis.

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