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Extraperitoneal Fluid Collection due to Chronic Pancreatitis

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Key Words
Chronic pancreatitis · Pancreatic ascites · Pseudocyst

Abstract
A 39-year-old man was referred to our hospital for the investigation of abdominal fluid collection. He was pointed out to have alcoholic chronic pancreatitis. Laboratory data showed inflammation and slightly elevated serum direct bilirubin and amylase. An abdominal computed tomography demonstrated huge fluid collection, multiple pancreatic pseudocysts and pancreatic calcification. The fluid showed a high level of amylase at 4,490 IU/l. Under the diagnosis of pancreatic ascites, endoscopic pancreatic stent insertion was attempted but was unsuccessful, so surgical treatment (Frey procedure and cystojejunostomy) was performed. During the operation, a huge amount of fluid containing bile acid (amylase at 1,474 IU/l and bilirubin at 13.5 mg/dl) was found to exist in the extraperitoneal space (over the peritoneum), but no ascites was found. His postoperative course was uneventful and he shows no recurrence of the fluid. Pancreatic ascites is thought to result from the disruption of the main pancreatic duct, the rupture of a pancreatic pseudocyst, or possibly leakage from an unknown site. In our extremely rare case, the pancreatic pseudocyst penetrated into the hepatoduodenal ligament with communication to the common bile duct, and the fluid flowed into the round ligament of the liver and next into the extraperitoneal space.

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Introduction

It is well known that patients with chronic pancreatitis may develop massive ascites, termed 'pancreatic ascites', as a complication, and this disease also occurs in patients with acute pancreatitis or pancreatic trauma. It is thought to be a rare complication in general. However, since the first report by Davis and Kelsy in 1951 [1], this disease has been recognized widely and many cases have been reported in the literature. Pancreatic ascites occurs due to leakage of pancreatic juices from a ruptured pseudocyst or directly from ductal disruption, and is associated with a high morbidity and mortality. The diagnosis of pancreatic ascites is made by medical examination, diagnostic imaging and analysis of the ingredients of ascites. To make an accurate diagnosis is thought to be comparatively easy when a high level of amylase is proven in ascites. The treatment of this disease depends on the cause, and conservative therapies, endoscopic therapies and surgical therapies are adopted. The prognosis of this disease is good if appropriate treatments are performed and if the cause of this disease, such as pancreatic trauma as well as chronic and acute pancreatitis, is well controlled.

Herein we report our rare case of pancreatic ascites, who was treated successfully but in whom we failed to make an accurate diagnosis, with a review of the literature.

Case Report

A 39-year-old man was referred to our hospital for the investigation of abdominal fluid collection. He had no symptoms before this admission, but he was pointed out to have alcoholic chronic pancreatitis with calcification and multiple pseudocysts by medical checkup. Laboratory data on admission showed high levels of C-reactive protein at 12.4 mg/dl (normal <0.3), a white blood cell count at 20 × 10^3/mm^3 (normal 3.9–9.3 × 10^3), direct bilirubin at 2.2 mg/dl (normal 0.2–1.0), amylase at 185 IU/l (normal 36–120), low levels of red blood cells at 176 × 10^4/mm^3 (normal 400–540 × 10^4) and hemoglobin at 6.7 g/dl (normal 12–16). Abdominal computed tomography demonstrated huge fluid collection pressing on the visceral organs, multiple pancreatic pseudocysts and pancreatic calcification (fig. 1). The fluid showed a high level of amylase at 4,490 IU/l. Under the diagnosis of pancreatic ascites, at first conservative therapy and continuous fluid drainage was done, but reduction of discharge was not observed. Endoscopic pancreatic stent insertion was attempted but was unsuccessful. Under the diagnosis of pancreatic ascites caused by disruption of the pancreatic duct and rupture of a pancreatic pseudocyst, surgical treatment was attempted. At laparotomy, a huge amount of fluid containing bile acid (amylase at 1,474 IU/l and bilirubin at 13.5 mg/dl) was found to exist in the extraperitoneal space (over the peritoneum) (fig. 2), but no fluid was found in the abdominal cavity. Extraperitoneal fluid collection due to chronic pancreatitis was diagnosed, and Frey procedure, cystojejunostomy, cholecystectomy and T tube placement in the common bile duct were performed. His postoperative course was uneventful and he has shown no recurrence of the fluid for 2 years.

Discussion

Pancreatic ascites often occurs in alcoholic patients who have chronic pancreatitis, although it has also been observed after acute pancreatitis or pancreatic trauma. Men are

affected twice as frequently as women and most patients are between 20 and 50 years old [2]. The chief complaints include weight loss, increasing abdominal girth and mild abdominal pain. Severe pain is distinctly unusual. Nausea, vomiting and diarrhea frequently accompany the development of pancreatic ascites. As described above, patients with pancreatic ascites sometimes lack specific complaints, which makes an accurate diagnosis difficult. Pancreatic ascites must be distinguished from the ascites of liver cirrhosis, tuberculosis and metastatic carcinoma. Elevated protein and amylase levels in the ascitic fluid lead to the accurate diagnosis. An amylase level above 1,000 IU/l along with a protein measurement >3 g/dl is diagnostic of pancreatic ascites [2–5]. In our case, we diagnosed the patient as having pancreatic ascites because of the high amylase level of ascites, his past history and the computed tomography findings with chronic pancreatitis and pseudocysts.

Until now, the causes of pancreatic ascites are not fully understood. It is thought to result from disruption of the main pancreatic duct, rupture of a pancreatic pseudocyst or possibly leakage from an unknown site [6]. The disruption or rupture is caused by increased pressure within the pancreatic duct or pseudocyst, with an acute inflammatory reaction of the chronic pancreatitis. Other proposed etiologies include blockage of the pancreatic lymphatics in the retroperitoneal space [7], portal venous obstruction from extrinsic pancreatic pressure, chemical effects of released pancreatic secretions on the peritoneal cavity membranes [8] and local release of vasoactive peptides [2]. In our case, we found many pancreatic stones and pseudocysts, so the disruption or rupture occurred because of the increased pressure within the pancreatic duct or pseudocyst.

The treatment of pancreatic ascites depends on the cause. For patients with pancreatic ascites secondary to trauma, early surgical repair is recommended. In cases of alcoholic pancreatitis, a conservative approach seems indicated. At first, conservative therapies such as elemental diet, parenteral nutrition, paracentesis, continuous percutaneous drainage and somatostatin analogues are selected [9]. When these therapies end in failure, endoscopic [10, 11] or surgical procedure [12, 13] is adopted. In our case, conservative and endoscopic therapy failed and operation was done. This operation disclosed that the main fluid collection was in the extraperitoneal space. Considering extraperitoneal fluid collection, Wixson et al. [14] reported a case of extraperitoneal fluid collection and liver displacement, but its mechanism and the origin of the fluid was not reported clearly. Thinking about the mechanism of our case, at first, a pancreatic pseudocyst penetrated into the hepatoduodenal ligament. At the same time, increased pressure within the common bile duct by pancreas head inflammation or direct chemical stimulation of the pancreatic juice caused perforation of the common bile duct, and at last, the fluid flowed into the round ligament of the liver and next into the extraperitoneal space. The perirenal space communicates with the bare area of the liver [15], so this route is the next candidate, but our case must have been different because of the location of the pseudocysts and the presence of bile in the fluid.

Conclusion

Herein we report a rare case of extraperitoneal pancreatic fluid collection caused by the chronic pancreatitis. This complication is rare, but we believe that our experience will be helpful when physicians see patients with pancreatic ascites.

Disclosure Statement

There are no conflicts of interest.

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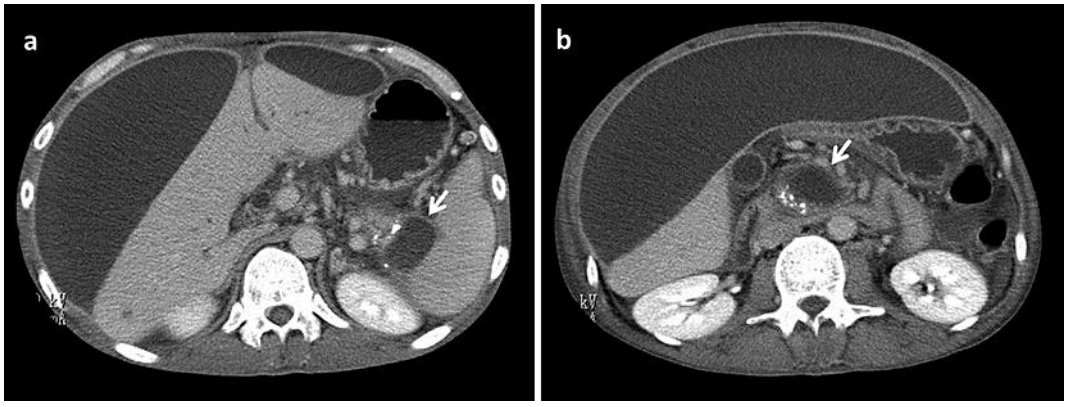

Fig. 1. **a**, **b** Abdominal computed tomography demonstrated fluid collection in the abdomen. We supposed at first that it was capsulated ascitic fluid. The edge of the fluid collection was dull, indicating that the fluid was capsulated. The arrows indicate the pancreatic calculi and the pseudocyst.

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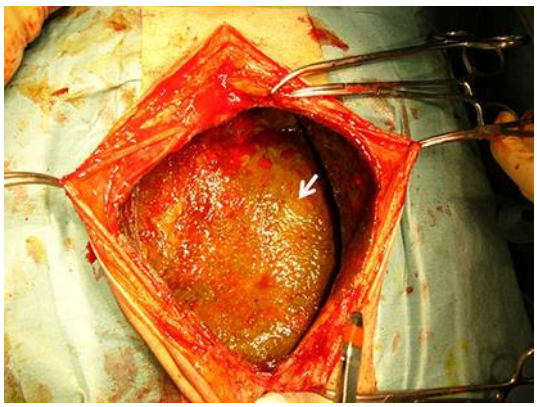

Fig. 2. Operative findings showed that a huge amount of fluid containing bile acid over the thick peritoneum (arrow).