

# Percutaneous Drainage of Large Subcapsular Hematoma of the Spleen Complicating Acute Pancreatitis

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The splenic complications associated with acute or chronic pancreatitis are rare, including splenic vein thrombosis, arterial pseudoaneurysm, subcapsular splenic hematoma, and splenic rupture. The management for subcapsular splenic hematoma in pancreatitis remains controversial. We herein report a rare case of large subcapsular splenic hematoma complicating acute pancreatitis, which was successfully treated by ultrasound-guided percutaneous drainage. A 32-year-old male suffered from intermittent epigastric pain radiating to his back. Acute pancreatitis complicated with subcapsular splenic hematoma (15.0 × 13.0 × 9.5 cm) was shown on abdominal computed tomography (CT). He underwent ultrasound-guided percutaneous drainage of the splenic hematoma. The size of the splenic hematoma had reduced to 9.5 × 2.3 cm 10 days later. After 4-week drainage of the hematoma, the abdominal pain improved and the patient was discharged. Follow-up abdominal CT 6 months later showed that the subcapsular splenic hematoma had almost completely resolved. The post-drainage course was smooth, and the patient had no abdominal symptoms at the 1-year follow-up. [*J Chin Med Assoc* 2008;71(2):92–95]

**Key Words:** acute pancreatitis, hematoma, percutaneous drainage, spleen

## Introduction

Subcapsular hematoma of the spleen is a rare complication of acute or chronic pancreatitis.<sup>1–6</sup> The management of this complication remains controversial. Thompson and Ashley<sup>7</sup> advocated early splenectomy to prevent rupture of the splenic hematoma and its associated morbidity. Rypens et al<sup>6</sup> suggested that most of these complications could potentially regress and be managed conservatively. In addition, percutaneous drainage of the subcapsular splenic hematoma has been demonstrated in 2 case reports in the literature.<sup>8,9</sup> We herein present a case of a large subcapsular splenic hematoma complicating acute pancreatitis with symptoms of intermittent abdominal pain. The splenic hematoma was treated successfully with ultrasound-guided percutaneous drainage.

## Case Report

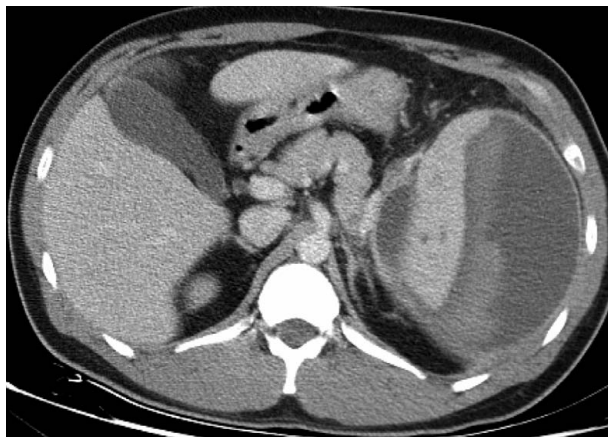
A 32-year-old male was admitted to our hospital because of epigastric pain radiating to his back for 2 weeks. He had had hypertriglyceridemia for many years that was controlled with gemfibrozil. He was also a heavy drinker, with alcohol consumption of 60 g/day for 5 years. He had an episode of acute pancreatitis about 1 year before admission. Two weeks before admission, he developed fever and severe epigastric pain radiating to the back. He was admitted to another hospital with the diagnosis of acute pancreatitis. Intravenous fluid supply, nothing per oral, and empiric antibiotics were prescribed. No biliary tract stone was found on abdominal ultrasonography. The fever subsided 9 days later. Packed red blood cells (RBCs) were transfused because of anemia. He tried



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diet and no abdominal pain was noted, so he was discharged.

However, the intermittent epigastric pain with radiation to his back recurred. He visited our emergency room, where abdominal examination revealed epigastric and left upper quadrant tenderness with rebounding pain. Laboratory data showed white blood cell (WBC) count of  $11,700/\mu\text{L}$ , hemoglobin level of  $10.9\text{ g/dL}$ , serum amylase level of  $266\text{ U/L}$  (normal,  $<180\text{ U/L}$ ), serum lipase level of  $473\text{ U/L}$  (normal,  $<190\text{ U/L}$ ), and C-reactive protein (CRP) level of  $12.5\text{ mg/dL}$  (normal,  $<0.5\text{ mg/dL}$ ). Chest X-ray showed left-side pleural effusion with atelectasis of the left lower lung. Abdominal ultrasonography revealed a large cystic lesion about  $13 \times 10\text{ cm}$  in size in the left upper abdomen. Abdominal computed tomography (CT) depicted a blood-containing fluid space measuring  $15.0 \times 13.0 \times 9.5\text{ cm}$  in the left upper abdomen (Figure 1). The lesion was attached to the



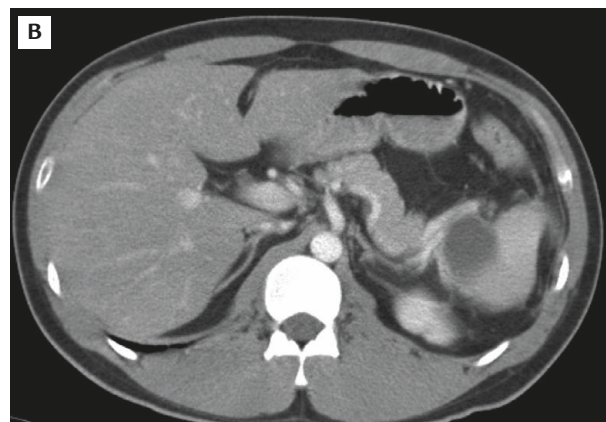
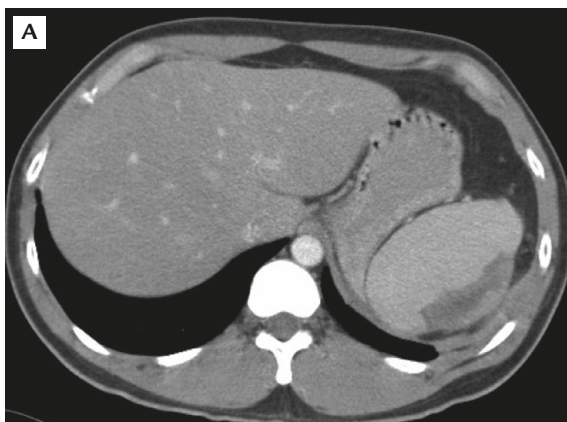
**Figure 1.** Abdominal computed tomography shows a large blood-containing fluid space measuring  $15.0 \times 13.0 \times 9.5\text{ cm}$ . The lesion is confined to the splenic capsule and attached to the pancreatic tail.

pancreatic tail, with most of its volume confined to the splenic capsule. Subcapsular splenic hematoma was impressed.

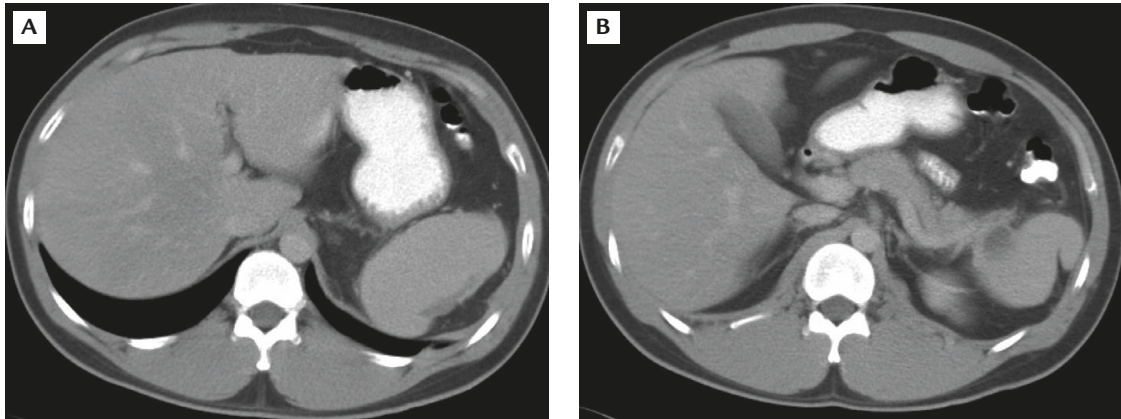
After admission, surgical consultation was obtained, and we decided to arrange for percutaneous drainage. The patient underwent percutaneous drainage with an 8-Fr pigtail drainage tube under ultrasound guidance, and dark red old blood-like fluid was drained. Laboratory data of the drainage fluid revealed WBC count of  $19,690/\mu\text{L}$ , RBC count of  $1,650/\mu\text{L}$ , amylase level of  $872\text{ U/L}$  and lactate dehydrogenase level of  $12,730\text{ U/L}$ . Local tenderness over the puncture site, dizziness, hypotension ( $90/60\text{ mmHg}$ ) and fever ( $38.5^\circ\text{C}$ ) developed after the procedure. The total drainage amount was  $730\text{ mL}$  during the first day. His vital signs became stable 1 day later, and the epigastric pain also improved.

One week later, serum levels of amylase, lipase, CRP and WBC had decreased to  $70\text{ U/L}$ ,  $144\text{ U/L}$ ,  $1.3\text{ mg/dL}$ , and  $5,700/\mu\text{L}$ , respectively. The splenic hematoma was still  $9.5 \times 2.3\text{ cm}$  in size as shown on abdominal ultrasound. The pigtail tube was exchanged to 10-Fr and 16-Fr subsequently due to pigtail obstruction with poor drainage amounts.

Four weeks later, the drainage volume had decreased to  $10\text{ mL}$  a day, and the drainage tube was then removed. The abdominal pain had also improved and the patient was discharged in a stable condition. Abdominal CT obtained 1 month after discharge showed splenic hematoma resolution ( $6.3 \times 3.0 \times 1.7\text{ cm}$ ) and pseudocyst formation ( $4.2 \times 3.6 \times 3.0\text{ cm}$ ) in the splenic hilum (Figure 2). Follow-up abdominal CT 6 months later demonstrated that the subcapsular splenic hematoma had almost completely resolved (Figure 3A). The size of the pseudocyst in the splenic hilum had decreased to  $2.8 \times 2.4 \times 2.2\text{ cm}$  (Figure 3B). The patient remained asymptomatic and no other



**Figure 2.** Abdominal computed tomography 2 months later demonstrates: (A) thick-walled subcapsular fluid collection in the spleen measuring  $6.3 \times 3.0 \times 1.7\text{ cm}$ ; (B) pseudocyst formation ( $4.2 \times 3.6 \times 3.0\text{ cm}$ ) in the splenic hilum.



**Figure 3.** Abdominal computed tomography 6 months later shows: (A) subcapsular splenic hematoma almost completely resolved; (B) pseudocyst in the splenic hilum measuring 2.8 × 2.4 × 2.2 cm.

episode of pancreatitis had occurred by the 1-year follow-up.

## Discussion

The pancreatic tail is close to the hilum of the spleen. This anatomy provides a potential for splenic involvement in pancreatitis.<sup>2-5,10,11</sup> Splenic complications associated with pancreatitis include splenic vein thrombosis, arterial pseudoaneurysms, splenic hematoma and splenic rupture.<sup>1-6</sup> These complications occur in 1–5% of pancreatitis.<sup>5</sup> They may occur through 1 of 3 mechanisms: (1) splenic vessel complications, such as thrombosis and pseudoaneurysm formation; (2) dissection of a pancreatic pseudocyst into the hilum of the spleen, which can cause splenic rupture, splenic infarction, arterial hemorrhage, or venous thrombosis; or (3) extension of the inflammatory process from the tail of the pancreas into the hilum of the spleen, which may induce hematoma formation.<sup>2-6</sup>

Splenic hematoma is a rare complication of acute or chronic pancreatitis when compared with traumatic origin of subcapsular hematoma. In a recent large series of 500 patients with chronic pancreatitis, an estimated prevalence of 0.4% was reported.<sup>1</sup> Local factors (thrombosis of the splenic artery or veins, intrasplenic pseudocysts, perisplenic adhesions, enzymatic digestion) and coagulation disorders may play a role in the pathogenesis of splenic hematoma.<sup>2,3,6,7</sup> The splenic hematoma in this case was probably caused by the erosion of non-cystic pancreatic inflammation from the tail of the pancreas into the hilum of the spleen as demonstrated on abdominal CT. Fortunately, the hematoma that develops in this situation is contained within the splenic capsule initially.<sup>7</sup>

Because splenic involvement in patients with acute or chronic pancreatitis is uncommon, the diagnosis of subcapsular hematoma of the spleen needs the alertness of physicians and imaging studies. Patients with pancreatitis exhibiting a mass in the left upper quadrant, pain radiating to the left shoulder, elevation of the left diaphragm, and a moderate fall in hematocrit should be suspected to have splenic complications. Abdominal CT should be performed early in questionable patients. A splenic hematoma can be distinguished from simple fluid collection based on density (Hounsfield units > 30). Angiography is not essential for the diagnosis, but would be indicated if splenic artery pseudoaneurysm, splenic vein thrombosis or active bleeding was suspected.<sup>7,12</sup>

The management of subcapsular splenic hematoma in pancreatitis remains controversial.<sup>10</sup> Surgical treatment with splenectomy, percutaneous drainage, and observation are management options. Kuramitsu et al<sup>12</sup> reported 1 case with chronic pancreatitis and a large subcapsular splenic hematoma (10 × 10 cm). After conservative management for 6 weeks, the size of the hematoma had not change; rupture of the hematoma with peritonitis occurred after a relapse of pancreatitis, which prompted surgical intervention.<sup>12</sup> They suggested that in cases of large splenic hematoma (> 5 cm) as a complication of pancreatitis, pressure reduction by percutaneous drainage or laparotomy should be administered as early as possible. Some reports have advocated aggressive management with early splenectomy to avoid splenic rupture.<sup>1,7,13</sup> Thompson and Ashley<sup>7</sup> described 3 cases with acute pancreatitis accompanied by large subcapsular hematoma of the spleen. Two patients recovered after splenectomy, but 1 patient died due to continuing blood loss. They suggested that the treatment of subcapsular splenic hematoma should

be a splenectomy in the vast majority of patients to prevent continuing blood loss and potential rupture.<sup>7</sup>

Percutaneous drainage for splenic subcapsular collections may be a feasible treatment, but there are only a few reports of it in the literature. Quinn et al<sup>14</sup> reported 2 cases of intrasplenic pseudocysts due to pancreatitis and 2 cases of traumatic splenic hematoma undergoing percutaneous drainage. Vyborny et al<sup>9</sup> were the first to demonstrate successful ultrasound-guided percutaneous drainage of a large subcapsular hematoma of the spleen complicating pancreatitis. Siu<sup>8</sup> described 1 case of spontaneous subcapsular hematoma of the spleen (13 × 8 × 5 cm) complicating chronic pancreatitis that was treated by CT-guided percutaneous drainage. Both reports showed that the benefits of percutaneous drainage of a splenic hematoma include prompt relief of symptoms, short recovery time, avoidance of splenic rupture and, most importantly, spleen preservation.<sup>8,9</sup> No complication was noted after the procedure. The patients remained asymptomatic at 2 and 0.5 years of follow-up, respectively.<sup>8,9</sup> Our patient is the third documented case of successful percutaneous drainage of a large subcapsular splenic hematoma complicating pancreatitis. The drainage tube sizes in previous reports were 8.3 and 10 French, respectively. In our patient, percutaneous drainage with an 8-Fr pigtail drainage tube under ultrasound guidance was performed initially. Pigtail tube obstruction with poor drainage was later noted, so the tube was subsequently changed to 16-Fr, which led to better drainage. The splenic hematoma of the patient had almost completely resolved 6 months later, and the patient remained asymptomatic at the 1-year follow-up. No procedure-related complication or recurrent hematoma was found.

Rypens et al<sup>6</sup> reviewed 16 patients with splenic parenchymal complications of acute or chronic pancreatitis. Subcapsular splenic collections were detected in 11 patients. Two patients underwent emergency splenectomy, 2 patients received delayed splenectomy, and the others were treated conservatively. Time for healing of splenic lesions varied from 1 week to 4 months.<sup>6</sup> The authors suggested that most splenic complications of pancreatitis regress spontaneously and may be managed conservatively. Surgical indication is based on clinical findings. Patel et al<sup>15</sup> reported a case of large subcapsular splenic hematoma (11.1 × 9.5 cm) resulting from pancreatitis that was managed conservatively with a good outcome. A CT scan performed 4 months later showed marked resolution of the hematoma. They suggested that it is appropriate to manage splenic subcapsular hematoma conservatively in a hemodynamically stable patient who is showing improving symptoms and signs.<sup>15</sup>

In conclusion, the definitive management of a subcapsular splenic hematoma complicating acute pancreatitis is not yet established. Surgical intervention may be the therapy of choice for hemodynamically unstable patients. Imaging-guided percutaneous drainage appears to be another feasible option for large subcapsular splenic hematomas to prevent splenic rupture and obviate splenectomy.

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