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CLINICAL STUDY

Coincidence of splenic vein aneurysm and haemorrhagic cyst of the pancreas

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ABSTRACT
Pseudoaneurysm of the splenic vein is a rare entity which is associated with pancreatitis in 52 % cases. Pseudocysts of the pancreas create approximately 70 % of all cystic lesions of the pancreas. One of the most dangerous complications of pancreatic pseudocysts is bleeding into the cystic lumen. This is caused by perforation of the pseudoaneurysm of the splenic vein. Enzymatic damage of the splenic vein´s wall is the cause of pseudoaneurysm. The clinical condition varies. It can be asymptomatic or bring about haemodynamic instability. The diagnostic process of pseudoaneurysm of the splenic vein is difficult. This case study introduces a case of a 50-year-old man with the anamnesis of recurrent pancreatitis caused by alcoholism. He had abdominal pain and was diagnosed with a pseudocyst of the pancreas. Abdominal CT showed an extensive capsulated collection in the left subphrenic space, 23cm in diameter, with serosanguineous content and coagulations. The CT visualised the mass effect on the surrounding tissues and a complete deformation of the spleen. Between the collection and partially oppressed tail of the pancreas there was a venous pseudoaneurysm, 3.5cm in diameter. Considering its localization, it most probably originated from the splenic vein. Surgery was done. We did distal resection of the pancreas with a complete removal of the pseudocyst and spleen *(Fig. 7, Ref. 11)*. Text in PDF *www.elis.sk*
KEY WORDS: splenic vein, pseudoaneurysm, pancreatitis, pancreatic pseudocysts.

Introduction

Pseudoaneurysm of the splenic vein is a rare diagnosis, but a deadly entity because it is associated with life-threatening bleeding. Up to date, there are fewer than 200 cases published in literature. This is the reason, why this diagnosis is a very difficult diagnostic problem. The most frequent aetiology of the splenic vein´s pseudoaneurysm is pancreatitis (52 %), acute and chronic pseudocysts (6 % and 46 %, respectively), abdominal trauma (29 %), postoperative complications (3%) and peptic ulceration (2 %) (1, 2). Pancreatic pseudocysts represent 80 % of benign pancreatic lesions, usually originating after acute pancreatitis or incidentally with the chronic form of pancreatitis (1). The incidence of pancreatic pseudocysts alongside chronic pancreatitis is from 20 % to 40 % and usually is detected in cases with chronic alcoholic pancreatitis (1). The most frequent complications of pancreatic pseudocysts are the compression of abdominal blood vessels, gastric or duodenal stenosis, stenosis of the common bile duct (cholestasis), infection and bleeding into the cyst. We have several methods for the treatment of pancreatic pseudocyst: percutaneous or endoscopic drainage, or surgery (cystogastrostomy, cystojejunostomy, pancreatectomy) (1, 2, 3).

Pathophysiology

The splenic vein is dominant in forming pancreatic pseudoaneurysms because of its course along the pancreas before reaching the spleen. Pseudoaneurysm differs from an aneurysm because its wall is formed of fibrous tissue, not of arterial tissue. Its basic part is haematoma that can anytime grow in size or rupture. This destruction is caused by the autodigestive process caused by pancreatic enzymes, which leads to the weakening of the arterial wall. If the autodigestive process takes a long time, it can create a total or partial vascular cystic structure. Because of its position, the splenic vein is affected by pancreatitis and pseudoaneurysms are common. Pseudoaneurysms can enlarge and rupture into the concomitant pseudocyst which fills biliopancreatic ducts. In this case, it leads to bleeding through the Vater´s ampulla into the gastrointestinal tract. Pseudoaneurysms can also perforate into the peritoneal cavity or into the retroperitoneal space (6, 7, 8).

Diagnosis

Up to the perforation of the aneurysm, most of the patients have no or nonspecific symptoms. High index of suspicion is

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necessary in patients with pancreatitis, alcoholism or after pancreaticobiliary surgery. If repeating bouts of hematemesis or haematochezia is present, it is important to think about pancreatic pseudoaneurysm. If the patient has acute abdominal pain with a decrease in haemoglobin and/or there is a postoperative haemodynamic instability, the bleeding from pseudoaneurysm of the splenic vein is a possibility. It should be also considered in case that patients with a pseudocyst of the pancreas diagnosed in past present with a fast cyst enlargement with pulsation. There are indeed other physical symptoms of bleeding as pallor, tachycardia, and hypotension.

Angiography is the most effective method for the diagnosis and treatment. CT angiography has got a very high measure of sensitivity and specificity. It shows very exactly the character and location of the lesion and provides temporary control over bleeding by using transcatheter embolization or stent. There is classification of pancreatic pseudoaneurysm based on the signs as follows:

- Type of blood vessel associated with the origin of pseudoaneurysm
- Absence of communication with GI tract
- Absence of highly concentrated pancreatic fluid in the site of bleeding

It is very important to realize, that CT angiography is appropriate only for stable patients.

Treatment

Pseudoaneurysms communicating with a pseudocyst localised on the pancreatic cauda can be an indication for surgery. Sometimes, the removal of the pseudocyst can bring about haemostasis. In patients, who have had bleeding into the pseudocysts, the endoscopic embolization is not recommended. If the surgery is done, it is necessary to stabilize the patient as soon as possible. The bleeding can be stopped by tamponade or digital compression. Gaining access to the location where bleeding is to be stopped can require doudenotomy, gastrotomy or partial gastric resection to be done. Ligation of the bleeding blood vessel is difficult because the tissues are crumbly.

Prognosis

Despite the surgery, the mortality of pancreatic pseudoaneurysms is about 20–30 %. Mortality depends on the location of the pathologic finding. The mortality is higher when the pseudoaneurysm is located in the pancreatic caput, while its localization in the cauda is associated with lower mortality. Embolization therapy increases the measure of success, but the frequency of relapses is still high and total mortality is about 16 %.

Postoperative complication

After the surgery, the patients have to be watched very carefully for the pancreatic leak after distal pancreatectomy. The incidence is about 30–50 %. Postoperative bleeding leads to mortality of 7–30 %. Pancreatic pseudoaneurysms can be also secondary to pancreatitis or car accidents. It is necessary to avoid the risk factor of alcoholism. If the patient is instable, the angiography cannot be done, and urgent laparotomy is necessary.

Case study

A 50-year-old patient was hospitalised in our surgery department because of abdominal pain with meteorism. The patient had pains for 7 days with no temperature and suffered from nausea without vomiting. He has been threatened for arterial hypertension. Patient smoked 20 cigarettes every day and drank about 0.5 litre of alcohol every day. His arterial blood pressure was 150/90, pulse 80/min. The abdomen was without pain, without resistance, peristalsis was present. Laboratory results showed CRP: 127 Le:14, Hb:11. At first, the X-ray was done with a finding of a high state of his diaphragm on the left, heart shadow dilated on

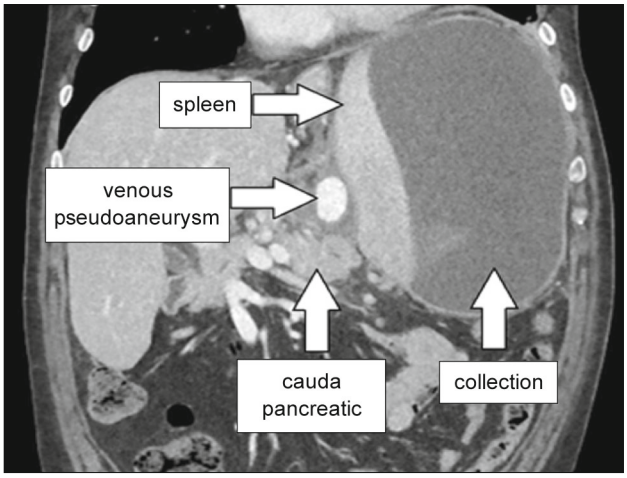

Fig. 1. CT scan.

Fig. 2. Oval pseudocystic material, size 25x15x10cm – on the left with stitches; bottom area view.

Fig. 3. Overgrown tissue of the pancreatic cauda, length 5 cm; upper area view.

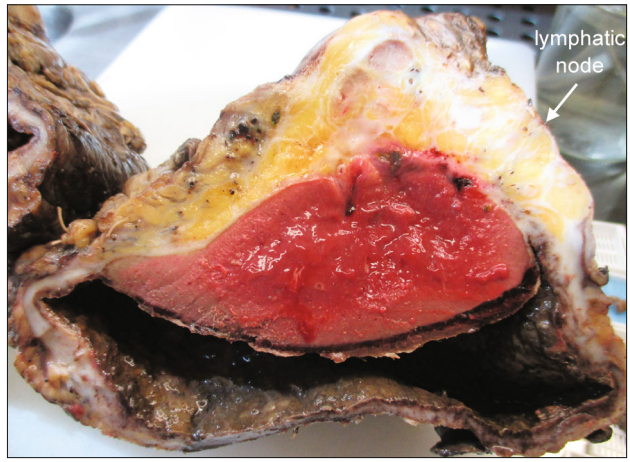

Fig. 6. Detail in the splenic hilus.

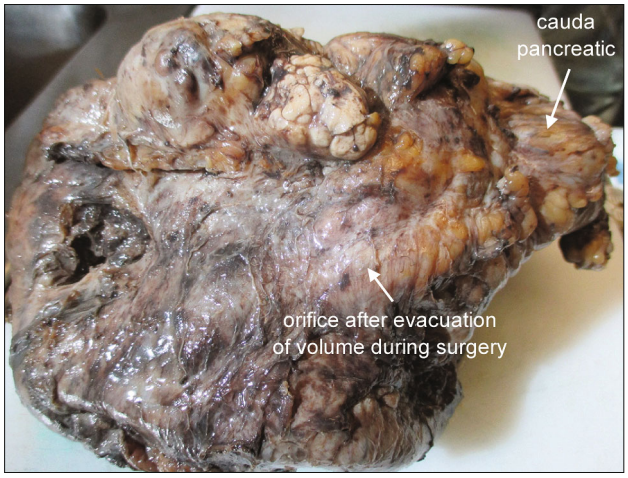

Fig. 4. Resection; front and bottom areas view.

Fig. 5. Cross-section after 24-hour fixation.

the right side, and unclear CF angle. Because of the unclear finding, CT was carried out (Fig. 1), which showed a large-volume capsulated collection, 23x15x20 cm in size, with serosanguineous character of the content with coagulations. Into the thick-walled collection was inserted the spleen, which was deformed. The CT scan visualized the mass effect that the collection had on the surrounding tissues and organs. Between the pancreatic cauda and spleen was a pseudoaneurysm, 3.5 cm in size. The dynamic post contrast CT showed the dynamic of vascular contrast opacification, and the maximum density was in the venous phase. It was a venous pseudoaneurysm. On CT, there was no evidence of active leak of contrast fluid from outside the lumen of the pseudoaneurysm into the retroperitoneal cavity or into the collection. In addition, there were reactive lymphatic nodes, reactive changes in fatty tissue, and effusion along the pancreas with an extension to Gerota´s fascia. In addition, there was a light form of pancreatitis, paraesophageal hernia, cirrhosis and small cysts in the liver, mild dilatation of the portal vein and varices found on the splenic vein.

The patient was indicated for urgent surgery. After subcostal bilateral incision, we found ascites and a thick-walled pseudocyst covered with *omentum majus*. Pseudocysts filled the entire left abdominal quadrant. We decided for the evacuation of fluid volume. We extracted one litre of chocolate-coloured fluid from the pseudocyst without necrosis. The major curvature of the stomach was fixed to the pseudocyst. The spleen was inserted into the pseudocyst. We liberated the pseudocyst from the diaphragm with the use of harmonic scalpel and did the high ligature of *a.et v. lienalis*. The bleeding was stopped by ligatures and harmonic scalpel. A lymphatic node ca 1x1.55 cm was removed from the upper edge of the pancreas for definitive histology. After this, we did distal pancreatectomy between the cauda and corpus (Figs 2, 3, 4). By way of elevating the liver, we found an axial hiatus hernia. More than half of the stomach was prolapsed into the thoracic cavity. We did hiatoplasty and fundoplication according to Nissen-Rosseti.

The histologic examination found fatty tissue on top of the resected tissue. Cross sections found a pseudocystic formation, 15 cm in diameter. In the centre, there was spleen tissue fixed into the pancreatic tissue. The pseudocystic formation was in the perisplenic space, in the lumen with a residue of brown content. After

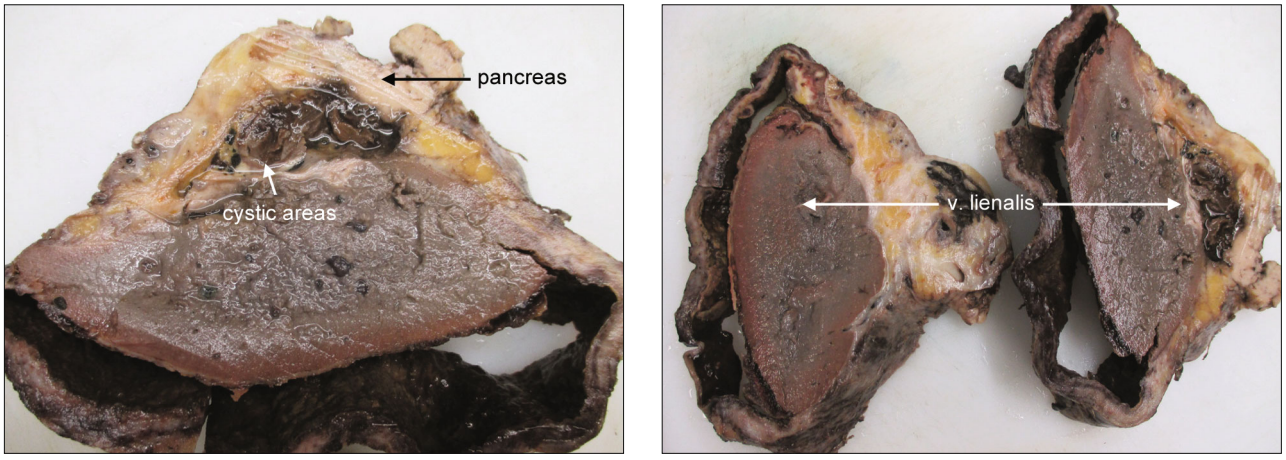

Fig. 7. Parallel section after 48-hour fixation.

serious processing in the hilus, between the pancreas and splenic hilus, a complex of smaller cystic formations was found, 2cm in diameter and with bloody content (Figs 5, 6, 7).

Microscopic findings confirmed chronic pancreatitis with fibrosis, atrophy and dilatation of pancreatic ducts. There was a small necrosis, also in the perisplenic space. In the fibrosis, there were lymphocytic inflammatory infiltrations. In the excisions from cystic spaces in fatty tissues between the pancreas and splenic hilus there was a pseudocystic space with haemorrhagic content. The wall of the pseudocyst is of fibrous venous tissue. In this tissue, there was an insertion of splenic tissue, with clearly definite white and red pulp, while the capsule was separated from own parenchyma and on the top, there was a layer of coagula. The last finding was revealed in the excisions from venous structures in front of the splenic hilus, where the edge of the ruptured aneurysm was detected in form of a section of venous wall (confirmed by special coloured method for elastin).

After the surgery, the patient was watched in ICU, where he got better. He took ATB i.v., infusions, analgesics, and LMWH. The patient was fed gradually. The operative wound was without inflammation. The drainage was retained because of high levels of amylases in secretions indicating a possibility of a fistula. CT was carried out with a finding of a small fluid collection in the area of the resection line. The patient was discharged in a stable condition. Up to date, the patient is without any disorders.

Discussion

Pancreatic pseudocysts are defined as a capsulated collection with well-defined inflammatory wall with or without pancreas with minimal necrosis (1, 2). Early recognition and management of this condition and its complications is necessary for its high mortality, namely about 40 % (1, 4). Intracystic bleeding is caused by automatic digestive process of proteolytic enzymes with strong inflammatory processes during acute pancreatitis episodes (5). A fistula can be formed between the pseudocyst and stomach, which leads to bleeding from the upper part of the gastrointestinal tract. The haemorrhagic pseudocyst can rupture into the retroperitoneal cavity, bile ducts or in the intraperitoneal cavity. This can be the reason of retroperitoneal bleeding and haemobilia (1, 3, 4).

On the other side, pancreatic cysts are usually localised around the pancreas, but sometimes can spread into other organs such as spleen, liver, colon, pararenal space, retroperitoneal cavity and mediastinum (4, 6, 7). Infiltration of spleen and intracystic bleeding (as in our case) is very rare. It was suggested that infiltration of the cyst into the spleen and retroperitoneal space is because of repeated perforations of the pancreatic duct into the retroperitoneal space. The differential diagnosis is very important. We have to consider retroperitoneal abscess, haematoma, tumour or atypical enlargement of a haemorrhagic pancreatic pseudocyst (4).

Experts´ evidence shows that a quick and proper diagnostic process improves the result and enhances the survival. Because of bleeding (as a major complication with high mortality), it is important to work with intervention radiologist. Embolization therapy has better results and lower mortality than surgery and has to be the method of choice if available (2, 8, 9). The best method of how to treat the pseudoaneurysms is to prevent them. It is necessary to be careful about medication that can lead to pancreatitis. In patients, who take anticoagulants it is necessary to employ a multidisciplinary approach. In the end, it is important to know, that haemorrhagic pancreatic pseudocysts can be the cause of a rare abdominal pain and acute anaemia.

Result

The small number of cases with this diagnosis shows that multidisciplinary teams are important for better treatment and survival (10, 11). Pancreatic pseudoaneurysms with pseudocysts can bring about dangerous, life-threatening complications. The result can be better with quick and exact diagnosis and early intervention. If the patient is instable and angiography is not possible, urgent laparotomy is necessary.

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