Case Report

A Case Report of Duodenal Stenosis due to a Ruptured Aneurysm of the Pancreaticoduodenal Artery

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A 58-year-old man with a long history of pancreatitis was referred to our hospital because of hematemesis. An upper abdominal examination series suggested the presence of a duodenal or pancreatic head tumor with bleeding. However, the mass noted in the first series of examinations disappeared completely after several days. Angiography revealed neither hypervascularity nor active bleeding, but a small aneurysm was seen in the posterior superior pancreaticoduodenal artery, indicating that the bleeding was due to a ruptured aneurysm. Selective microcoil embolization was performed successfully, and the post-procedural course was uneventful.

Key Words : duodenal stenosis, pancreaticoduodenal artery aneurysm, selective arterial embolization

Introduction

Aneurysms of the pancreaticoduodenal arteries (PDAs) are comparatively rare and constitute only 2% of all visceral artery aneurysms¹⁾. Because these lesions are generally asymptomatic, they are seldom detected until rupture, and the ruptured aneurysm leads to a potentially life-threatening condition in which the survival of the patient depends not only on correct diagnosis but also on immediate treatment. Surgical procedure has often been considered the best treatment option in such cases, but because of postoperative complications due to the excessive surgical stress, interventional radiology has recently become the treatment of choice²⁾³⁾. We report herein a ruptured aneurysm of a PDA in a patient with pancreatitis and summarize the clinical course. Appropriate actions to take in the rare case of a PDA aneurysm are discussed.

Case Report

A 58-year-old man suffering from a long history of chronic pancreatitis was referred to another hospital because of hematemesis. He had a 6-month history of repeated hospitalizations due to “non-bloody” vomiting, but each time, the symptom improved in a few days and no extensive examination was performed. During this most recent hospital visit, quite severe but temporary hematemesis was noted, and upper gastrointestinal endoscopic examination was performed. Active bleeding in the stomach was not noted, but the duodenum could not be examined due to serious stenosis of the antrum. Upper gastrointestinal X-ray with gastrographine showed a mass lesion pressing on the gastric antrum (**Fig. 1**), suggesting the presence of a duodenal or pancreatic head tumor. Computed tomography (CT) revealed a 5.5×4.5 cm mass and a 1.5×1.2 cm high-density spot located between the duodenum and the

Fig. 1 Upper gastrointestinal X-ray with gastrographine showed a mass lesion pressing on the gastric antrum.

pancreas (**Fig. 2a**). Because vital signs were stable and no more bleeding was noted, it was decided that the patient's general condition should be allowed to improve before the treatment strategy would be determined. However, after 7 days, massive bleeding occurred, and the patient was transferred to our hospital.

Upon admission, the patient's vital signs were stable. There was no tenderness or mass that could be felt upon physical examination of the abdomen. The results of blood tests were as follows: white blood cell count, $11,800/\text{mm}^3$; hemoglobin, 6.6g/dl ; blood urea nitrogen, 52.4 mg/dl ; serum creatinine, 2.47 mg/dl ; serum amylase, 126 IU/l . Results of total bilirubin and liver functional tests were normal. The patient underwent a blood transfusion and was prepared for surgery. Emergency CT was performed to evaluate the suspected tumor in the duodenum. However, the mass had disappeared completely (**Fig. 2b**). In addition, angiography revealed neither active bleeding nor hypervascularity of the peri-duodenal lesion, but a small aneurysm was detected in the posterior superior PDA (PSPDA)(**Fig. 3a**). To prevent re-bleeding, selective microcoil embolization of the PSPDA was performed (**Fig. 3b**). The post

Fig. 2 Computed tomography (CT) before admission our institute revealed a $5.5 \times 4.5\text{ cm}$ mass and a $1.5 \times 1.2\text{ cm}$ high-density spot located between the duodenum and the pancreas (a). According to CT 7 days after, the mass had disappeared completely (b).

a
b

-procedural course was uneventful, and the patient recovered completely. He has been in good condition for 19 months.

Discussion

The small intestine lesions involving the duodenum are a rare source of gastrointestinal bleeding and are commonly caused by arteriovenous malformation or benign tumor⁴⁾. Indeed, a review of published cases indicates that 87% of benign tumors causing gastrointestinal bleeding were located in the duodenum, and 64% were at other sites in the small intestine⁵⁾. In the present case, bleeding from a

Fig.3 Angiography revealed neither active bleeding nor hypervascularity of the peri-duodenal lesion, but a small aneurysm was detected in the posterior superior pancreaticoduodenal artery (PSPDA) (a). To prevent re-bleeding, selective microcoil embolization of the PSPDA was performed (b).

a
b

duodenal tumor was indicated by an upper abdominal experiment series. However, the patient's history of repeated episodes of vomiting that improved spontaneously were reflective of a problem other than a duodenal tumor. If this symptom had been caused by a solid mass, it would likely have worsened during the 6-month period. In addition, in a patient such as ours with chronic pancreatitis, the possibility

of a visceral vessel aneurysm should be considered because it is reportedly detected in 10% of patients with pancreatitis⁶⁾. The splenic artery is well-known to be the most common site of such an aneurysm. PDA lesions are comparatively rare, only 76 cases have been reported⁷⁾. In a recent study, pancreatitis-associated aneurysms were found in 16% of cases (12 cases). Therefore, the presence of a PDA aneurysm should be considered in cases of pancreatitis.

Surgical procedure has been considered the treatment of choice for aneurysm. However, recent studies recommend arterial embolization following diagnostic angiography²⁾⁸⁾⁹⁾. Despite the technical difficulty, the mortality rate associated with embolization has diminished from 42% to only 4%⁷⁾. The current problems of tissue necrosis and abscess formation due to ischemic injury can be avoided by the development of a selective embolization technique³⁾. Surgical intervention, such as suture ligation of the aneurysm artery or aneurysmectomy, remains the standard treatment, but detection of a ruptured PDA aneurysm is usually difficult during a surgical procedure. Indeed, it is achieved in only 30% of cases without preoperative angiography¹⁰⁾. In some cases, pancreaticoduodenectomy is considered for complete removal of the problematic lesion, but it can cause excessive surgical stress especially in emergency cases. Embolization was performed with a low complication rate in more than half of the 76 cases of PDA aneurysm reported since 1991⁷⁾.

In the present case, antral obstruction due to duodenal wall hematoma contributed to a difficult diagnosis and confusing findings. Fortunately, because of spontaneous hemostasis, angiography could be performed safely, and the small aneurysm detected in the PSPDA was treated by selective microcoil embolization to

prevent re-bleeding. In cases such as this one, it might be important to prepare for surgical procedure as a second step if bleeding continues after microcoil embolization.

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