

A case of emergency pancreatoduodenectomy for bleeding from the duodenal mucosa due to arteriovenous malformation of the pancreatic head

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Abstract

Arteriovenous malformation of the pancreatic head is a relatively rare disease that can cause gastrointestinal bleeding and abdominal pain and requires appropriate and prompt treatment. Herein, we discuss the clinical presentation and management of a patient with arteriovenous malformation of the pancreatic head.

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Keywords

Pancreatic arteriovenous malformation, duodenal bleeding

Key Clinical Message

A rare case of bleeding from the duodenal mucosa due to arteriovenous malformation of the pancreatic head is reported. Note that excision may be necessary if the general condition is good.

Introduction

Arteriovenous malformation of the pancreatic head (Ph-AVM) is relatively rare, causing gastrointestinal and intra-abdominal hemorrhage and severe abdominal pain. We herein report a case of Ph-AVM with hemorrhagic shock due to massive duodenal bleeding, successfully treated by emergency pancreatoduodenectomy.

Case presentation

A 45-year-old man with a 20-year history of duodenal ulcer presented to our hospital with vomiting and tarry stool. There was no abnormality with the physical examination, and laboratory data did not show anemia on admission, but few hours after he suddenly presented a hemorrhagic shock. The emergency endoscopy performed did not find upper gastrointestinal bleeding. Computed tomography (CT) revealed dilated blood vessels in the lower part of the descending duodenum, and spotty staining of the pancreatic uncinate process at the early phase (Fig.1) and the next day multifocal bleeding from the edematous duodenal mucosa near the papilla of Vater (Fig.2) were observed with endoscopy.

Considering the possibility of bleeding due to vascular lesions such as Ph-AVM based on CT findings, interventional radiology was performed for further diagnosis and treatment. Angiography revealed the definitive diagnosis of Ph-AVM with abnormal reticular blood vessels in the descending limb of the duodenum (Fig.3). Coil embolization failed in complete hemostasis, thus we decided to perform emergency surgery. A typical pancreatoduodenectomy was performed. Surgical findings showed the proliferation of abnormally dilated blood vessels at the pancreatic head. The operation time lasted for 5 hours, and the amount of bleeding was 500g.

Histopathological findings showed collections of irregularly tortuous blood vessels within the thick wall of the duodenal proper muscle layer adjacent to the pancreatic parenchyma near the major duodenal papilla. Fibrin thrombi were occasionally seen in the pancreatic parenchyma and submucosa of the duodenum (Fig.4).

The postoperative course was uneventful, and the patient was discharged 32 days after surgery, and he has remained in excellent health so far for 4 years and 9 months.

Discussion

Pancreatic AVM, first reported by Halpern et al. in 1968,¹⁾ is one of the abnormal blood flow diseases in which the arteriovenous system is short-circuited and anastomosed in the pancreas. The most common sites for gastrointestinal arteriovenous malformations are the cecum, ascending colon, and jejunum and pancreatic AVM accounts for only 0.9%.²⁾ The causes of this disease are classified into congenital due to the remnants of the primitive vascular network,³⁾ and acquired due to excessive angiogenesis caused by inflammation such as pancreatitis and trauma.⁴⁾ In this case, it was considered to be congenital because there was no particular history in the past.

According to 97 cases of pancreatic AVM reported by Hirai et al. in Japan,⁵⁾ pancreatic AVM is an overwhelmingly male disease since there were 90 males opposed to 7 females, as shown in this case. The average age is 54.4 years, which is relatively young. The most common symptoms were abdominal pain (47.4%) and gastrointestinal bleeding (38.1%). Repeated gastrointestinal bleeding was observed in this case as well. The causes were esophagogastric varicose bleeding due to portal hypertension associated with AVM, rupture of AVM itself into the gastrointestinal tract, bleeding from an ulcer caused by an ischemic change of the gastrointestinal mucosa due to progression of AVM, bleeding of AVM into the pancreatic duct, and bleeding of AVM into the bile duct.^{6,-7, 8)} In this case, no varicose veins were observed, no ulceration was formed, and bleeding from the papilla of Vater was not clear. Therefore, it is considered that the bleeding was caused by the mechanism of rupture of AVM itself into the gastrointestinal tract. Gastrointestinal ulcer (26.8%) was the most common comorbidity of pancreatic AVM, but it is unclear whether the history of this case treated for duodenal ulcer 20 years ago had something related to the cause or not. The AVM is located in the pancreatic head in more than half of the lesions in 56 cases (57.7%), and in the whole pancreas (10.3%) as this case.

Contrast-enhanced CT and angiography are helpful for diagnosis.⁶⁾ As a characterization of Contrast-enhanced CT result, it is known that in the early stage of the arterial phase, there is reticular deep stain of lesions and depiction of the portal vein,^{3, 9)} as well as dilated and tortuous inflowing blood vessels, reticular intra-pancreatic vascular plexus, and early venous return to portal vein or splenic vein are characteristic findings in Angiography. In addition, there are reports that angiography is not only important for diagnosis, but also for obtaining detailed information such as multiple lesions, localization of lesions, and their spread as well.¹⁰⁾ In this case, CT showed spotty staining of the pancreatic uncinate process, and angiography

showed a reticulated vascular plexus at the pancreatic head, which was similar in characteristics.

For treatment, pancreatic resection was performed in 46 patients (47.4%). Since there are many cases with lesions at the pancreatic head, pancreatoduodenectomy is performed most often, and it was performed in 30 cases (30.9%). Minimally invasive treatment with interventional radiology may be selected due to poor general condition; nevertheless, surgery is selected as the radical treatment if there are many inflowing blood vessels and complicated collateral circulation because it is difficult to embolize all of them. In this case, as well, complete hemostasis was not achieved with coil embolization, therefore pancreatoduodenectomy was selected.

Conclusion

We experienced a case in which emergency pancreatoduodenectomy was performed for hemorrhagic shock due to pancreatic AVM, and the patient was saved. For this disease, surgical resection also should be another option besides non-invasive treatment if necessary.

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Consent

The patient has provided written consent for the case report to be published.

Conflicts of interest

The authors declare no conflicts of interest in association with this study.

Authors' Contributions

MK drafted the manuscript. KK, NI, TO, ME, GK, RS, SU, RT and TS participated in the critical revision of the manuscript. All authors read and approved the final manuscript.

Abstract

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