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Case Report

Gastroduodenal artery aneurysm – A rare complication of traumatic pancreatic injury

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ABSTRACT

Aneurysm of gastroduodenal artery (GDA) is rare. Most reported cases are due to pancreatitis and atherosclerosis; however, those following pancreatic trauma have not been reported. We encountered GDA aneurysm in a patient of blunt abdominal trauma, who had pancreatic contusion and retroduodenal air on contrast enhanced computed tomography of abdomen. Emergency laparotomy for suspected duodenal injury revealed duodenal wall and pancreatic head contusion, mild hemoperitoneum and no evidence of duodenal perforation. In the postoperative period, the patient developed upper gastrointestinal hemorrhage on day 5. Repeat imaging revealed GDA aneurysm, which was managed successfully by angioembolization. This case highlights, one, delayed presentation of GDA aneurysm after blunt pancreatic trauma and two, its successful management using endovascular technique.

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Introduction

Arterial aneurysms, comprising of visceral and peripheral types, are a rare entity. Gastroduodenal artery (GDA) aneurysm, a type of visceral aneurysm, is extremely rare.¹ Blunt abdominal trauma has not been reported as a cause of GDA aneurysm. CT angiography is the gold standard for its management, which serves as both a diagnostic and a therapeutic modality. Alternatively, GDA aneurysm can be managed either by surgical vessel ligation and sac excision or stenting.²

Here, we present a case of a 20 year old male who suffered blunt abdominal trauma. On initial evaluation using abdominal contrast enhanced computed tomography (CECT), the patient showed pancreatic contusion and retroduodenal air with suspected duodenal injury. Emergency laparotomy revealed duodenal wall and pancreatic head contusion with mild hemoperitoneum and no evidence of perforation. But on postoperative day 5, the patient developed upper gastrointestinal hemorrhage which was further revealed to be induced by GDA aneurysm. The patient underwent angioembolization successfully.

Case report

A 20 years male presented to emergency department with alleged history of road traffic injury. On initial assessment as per ATLS protocol, primary survey was normal except for positive FAST and tenderness in the right hypochondrium with mild guarding. There was neither rigidity nor any visible external injury. After initial resuscitation, the patient was shifted for CECT of the abdomen and pelvis, which revealed multiple contusions of the pancreatic head and retroduodenal air with suspected duodenal injury. The patient was taken up for emergency exploratory laparotomy.

Preoperatively the patient had mild hemoperitoneum with contusions in the head of pancreas and no duodenal perforation. The patient was shifted to ICU for monitoring in the postoperative period, where he had a single episode of hematemesis and melena on the postoperative day 3. He was managed with fluids and medical treatment for upper gastrointestinal hemorrhage, and remained hemodynamically stable. On day 5, the patient had a similar episode of hematemesis and melena again with a sudden drop in hemoglobin from 114 g/L to 88 g/L. However, the patient remained hemodynamically stable and all the other blood parameters were within normal limits. Abdominal MRI was done to evaluate any evolution in pancreatic and duodenal injury. To our surprise, MRI revealed GDA

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pseudoaneurysm with free passage of contrast into the duodenum (Fig. 1). Superior mesenteric artery (SMA) was then scanned to rule out collaterals supplying the aneurysm, which showed SMA in normal territory and no collaterals to the aneurysm (Fig. 2).

The patient was planned for angiography and coil embolization. During angiography, contrast blush from GDA confirmed the diagnosis further. The aneurysmal neck was wide with contrast leaking into duodenum. Permanent angioembolization was done by coils across the possible origin of aneurysm in main hepatic artery. After embolization there was no distal flow in the hepatic artery and GDA (Fig. 3). The postoperative period was uneventful and the patient was discharged 4 days after the angioembolization. Till the six months of follow-up the patient did not have any episode of hematemesis or melena.

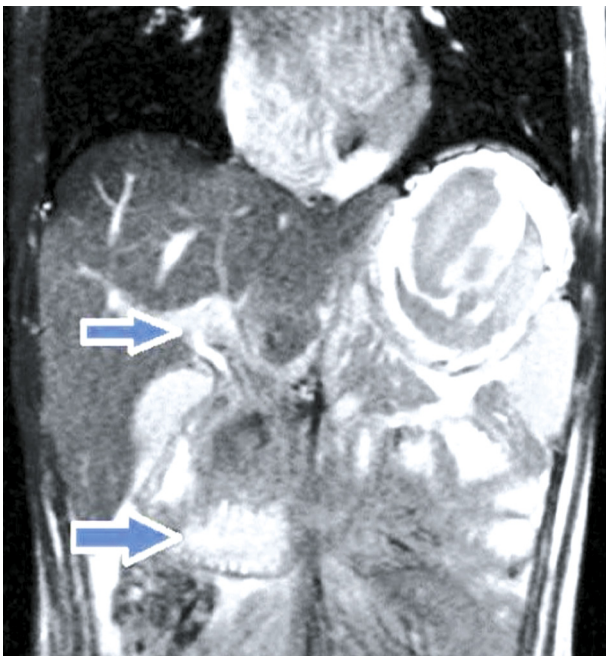


Fig. 1. Abdominal MRI shows GDA aneurysm with contrast in the duodenum.



Fig. 2. No collateral from SMA supplying the aneurysm.

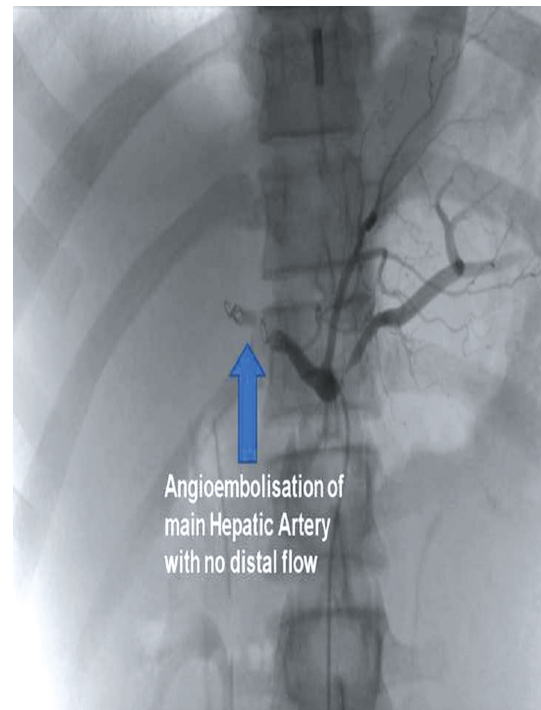


Fig. 3. There is no distal flow in the hepatic artery and GDA embolization.

Discussion

GDA aneurysms contribute less than 10% of all the splanchnic artery aneurysms.³ Most of the GDA aneurysms seen are associated with pancreatitis, ethanol abuse, cholecystectomy, various congenital disorders like Marfan's syndrome, polyarteritis nodosa, fibromuscular dysplasia and liver cirrhosis.^{1–3} GDA aneurysm in setting of trauma has not been described yet to the best of our knowledge. The most common presentation of GDA aneurysm is gastrointestinal hemorrhage (normally into duodenum) secondary to rupture (52%), followed by abdominal pain (46%). About 7.5% of GDA aneurysms remain asymptomatic. Rarer presentations include retroperitoneal and intraperitoneal bleeding, occasionally leading to obstructive symptoms like gastric outlet obstruction, bleeding into pancreatic duct or common bile duct and features of obstructive jaundice.⁴

Angiography is the gold standard diagnostic test as it can serve as a therapeutic modality as well, allowing therapeutic intervention with highest sensitivity (100%). Magnetic resonance angiography has also been reported to be as effective as visceral angiography in the diagnosis of abdominal vascular lesions.⁵

Therapeutic modalities for GDA aneurysm include open surgical and endovascular options. Traditional surgical intervention includes resection or ligation of aneurysm or bypass surgery. With the advancement in intervention radiology, there has been a shift to endovascular management. Hur et al⁶ in a study of 16 patients with GDA aneurysms following pancreaticoduodenostomy concluded endovascular trapping of the hepatic artery as a safe and effective procedure. Thus, the endovascular option being a less aggressive approach offers a good therapeutic alternative to surgical intervention, especially in patients with multiple comorbidities.⁷

Visceral ischemia and end organ infarction, end-organ thrombosis, and late-term vessel recanalization are the major complications of angioembolization.⁶ Others include coil/stent migration, intra-procedural aneurysm dissection, or rupture, access artery pseudoaneurysms and contrast-induced nephropathy. GDA aneu-

rysms have an up to 40% mortality rate following rupture, which depends on the site and severity of bleeding. Highest mortality is seen following rupture into the duodenum (21%).⁸ Hence GDA aneurysms should be managed promptly once identified, before any catastrophe occurs.

In conclusion, though GDA aneurysm is usually seen after chronic pancreatitis and atherosclerotic disease, it should also be considered as a differential in post-traumatic upper gastrointestinal bleeding, especially when there is pancreaticoduodenal injury. CT angiography is the gold standard but abdominal MRI is also effective in the diagnosis of GDA aneurysm, as in our case. Endovascular angioembolization should be considered as a preferred treatment modality for GDA aneurysms.

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