

CASE REPORT**Surgical management of Gastro-duodenal Artery Pseudoaneurysm: A Case Report**ABDUL HASEEB¹, AMINA ARIF², SANA HAMAYUN³, ALVINA KARAM⁴, WASEEM KHAN⁵, HAQ NAWAZ⁶^{1,3,5,6}Post Graduate Resident, Department of Surgery, Hayatabad Medical Complex Peshawar^{2,4}Medical Officer, Department of Internal Medicine, Hayatabad Medical Complex, PeshawarCorrespondence to Dr. Abdul Haseeb, Email: imdoc95@gmail.com, Cell: +92-3139636549**SUMMARY**

Gastro duodenal artery (GDA) Pseudo aneurysm is a rare cause of Upper GIT bleeding. It can be fatal in case of a rupture and has a very high risk of Mortality. Advanced Diagnostic techniques like CT Angiography should be carried out earlier in the disease course for Prompt Diagnosis. Here we discuss a case of a successfully surgically treated GDA pseudo aneurysm

Keywords: GDA Pseudo aneurysm; surgical resection; Embolization; Visceral artery Aneurysm

INTRODUCTION

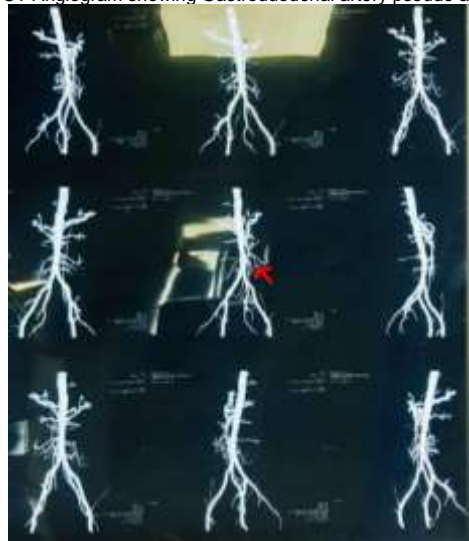
Gastro duodenal artery aneurysm is an uncommon but inherently lethal vascular condition. Visceral arterial aneurysm has an incidence of 0.01%-0.2%¹. Gastro duodenal aneurysm forms 1.5% of this total next to inferior mesenteric artery aneurysm.² Gastrointestinal bleeding is the most common cause of presentation in Emergency room. Early detection and prompt treatment can save life. Best treatment is angioembolization but can be treated by excision of ligated vessel sac as well.

CASE PRESENTATION

A 20 years old male patient with no previous co morbidities presented to emergency room of Hayatabad medical complex Peshawar Pakistan on the 13th of Sep 2021, with complains of bleeding per rectum (4 episodes) and Hematemesis (1 episode) for two days. On General physical examination patient was pale and tachycardic. Abdomen was soft, tender and non distended. Patient was well oriented in time, place and person and was hemodynamically stable. He underwent Appendectomy six months back. Upon admission to the Gastroenterology department his Hb was 3.1g/dl. After stabilization, OGD and colonoscopy were performed in the gastroenterology department of Hayatabad medical complex Peshawar, Pakistan, which were reported normal. He continued having melena and re colonoscopy showed malenic stool at T1 and throughout colon. Upper endoscopy with a gastro scope and duodenoscopy revealed fresh blood oozing from the pancreatic duct. Digital subtraction angiography done at Lady reading Hospital Peshawar Pakistan was also unremarkable. CT angiogram was done in the department of medical imaging Hayatabad medical complex on the 16th of Sep 2021 and no remarkable findings were reported. CT abdomen with contrast was done in the department of radiology RMI on the 21th of Sep 2021. A 13mm in maximum dimension Pseudoaneurysm arising from Gastro duodenal artery and bulging into the dilated pancreatic duct with active bleed into the main pancreatic duct and duodenum was observed. Case was reviewed with radiology team and a Re CT angiography was done which showed pseudoaneurysm in pancreatic head arising from the gastro duodenal artery with active bleed into main pancreatic duct into duodenum [Fig. 1] Embolization was attempted on the 21/9/2021 in the department of interventional radiology. Access through the celiac axis and then into the GDA was gained with VS and micro catheter. The aneurysm sac could not be crossed to gain access to the superior pancreaticoduodenal artery of the epiploic artery due to ecstatic vessels and acute bend. The retro duodenal artery and small pancreatic branches were being entered into. One small reroduodenal branch was embolized with 3*3 mm coil. The main GDA was embolized with 4*3mm and 4*6mm coil. Attempts were made to access the inferior pancreaticoduodenal artery via SMA. However, it was the 1st branch of SMA arising from the left anterior position, which was impossible to cannulate for the radiologist. The aneurysm was still filling SMA supply. Sheath was removed and

manual compression and pressure dressing was applied to the groin. No immediate complications were reported. Post embolization it was reported that although the flow from GDA was stopped the aneurysm was still filling with flow from SMA. The procedure decreased pressure in aneurysm sac by some degrees. Comments were made that the patient would need surgical treatment of the aneurysm that is the source of bleeding. But patient developed melena and hametemesis post operatively. Repeat CT angiography reveled feeding of the same aneurysm by superior mesenteric artery. Patient was admitted to Gastroenterology unit on the 24th/sep/2021. Blood pressure was 110/70. SaO2 was 96%. Patient was given omprazole injection. Endoscopy was unremarkable. Patient was shifted to surgical unit for surgical exploration (laporotomy) on the 27/sep/2021, Resection of Gastro duodenal artery aneurysm was done under GA on the 1/10/2021. Kocher's incision was given; GDA was identified and thereafter ligated and resected. Abdomen was closed in reversed order. Stain closed with prolene in vertical manner. Specimen was sent for biopsy. Patient kept NBM till further orders. Post Operatively Patient recovery was satisfactory.

Figure 1: CT Angiogram showing Gastroduodenal artery pseudo aneurysm

**DISCUSSION**

With the recent advancements in diagnostic procedures there has been an increase in the reporting of GDA aneurysms. Distribution of aneurysms of the splanchnic vessels includes involvement of the splenic artery (60%), hepatic artery (20%), SMA (6%), CA (4%), gastric and gastroepiploic arteries (4%), jejunal, ileal, and colic arteries (3%), pancreaticoduodenal and pancreatic arteries (2%), gastro duodenal artery (1.5%), and IMA, less than 1%¹. GDA

aneurysm was first reported by Starlinger in 1930. GDA usually presents with gastrointestinal bleeding².

Ferrero E et al and Gehlen JM et al suggested that the pathogenesis of GDA may be due to atherosclerosis (32% of cases), medial degeneration/dysplasia (24%), abdominal trauma (22%), infection and inflammatory disease (10%), connective tissue disorders (Marfan syndrome, Ehlers-Danlos syndrome, Osler-Weber-Rendu disease, fibro muscular dysplasia, Kawasaki, hereditary hemorrhagic telangiectasia), and conditions of increased blood flow (portal hypertension, pregnancy)^{2,3}.

Like all the aneurysms, VAA can be true or false. True aneurysms have no primary etiology whereas pseudo aneurysm usually arise secondarily to some other cause like pancreatitis, atherosclerosis etc. In our case the pseudoaneurysm was likely due to pancreatitis. Ikeda O et al reported in 2008 that, in true aneurysms all the 3 layers of the vessel wall are intact but thinned and dilated. Pseudo aneurysms or false aneurysms usually result from a tear in the vessel wall. Iatrogenic causes of VAPA include surgical, endoscopic and interventional radiological procedures, or secondary to trauma, infectious and inflammatory conditions⁴.

Indications for treatment of VAA and VAPA is highly ambiguous and there is no consensus on a standardized treatment. VAPA should be treated on identification due to high risk of rupture. The ultimate goal of treatment of VAA and VAPA is the exclusion of the aneurysmal sac from the systemic circulation and the preservation of distal blood flow. Surgical or endovascular procedures may be used to accomplish this. Pulli R et al reported low mortality rates of <0.5% in elective repair of GDA aneurysm^{5,6,7}.

Schweigert M reported a mortality rate of 20% to 70% in case of rupture of a VAA depending on the location and size.⁸ If we look into the Pathogenesis of GI bleeding, it is likely related to intermittent erosion and breakdown of the wall of aneurysm through the duodenal wall, secondary to pressure necrosis caused by the over expanding aneurysm (which may be calcified). In 2008 Keeper MA et al reported in their study that although weakening of the arterial wall secondary to atherosclerosis is the usual pathogenesis for true aneurysms. Atherosclerotic celiac trunk may at times cause retrograde flow of blood through superior mesenteric then pancreaticoduodenal arteries with consequent building of pressure in the GDA and aneurysm formation⁹.

Ghasura A et al suggested in his study that a high index of suspicion should always be kept when encountering GIT hemorrhage about the source of bleeding being GDA aneurysm as OGD which is considered the gold standard for evaluation of patient with GIT hemorrhage may not pick GDA aneurysm as the source of bleeding which was the case in his report. Ghasura A et al reported that visceral angiography is the investigation of choice in case of a GDA considering it has a higher sensitivity when being compared with an Abdominal CT (100% vs. 76%). Also visceral angiography is therapeutic as well that is why it should be the next step after an OGD¹⁰.

Morita Y et al reported in his study that Pseudo aneurysms mostly occur in middle age and are most commonly found between 50 and 58 years of age. He also suggested its occurrence to be more common in males as compared to female with the male/female ratio to be 4.5:1 and the mean size 3.6 cm.¹¹ A review of the English literature over a 25 year period from 1970 to 1995 was performed, pancreatitis was found to be the most common associated condition with gastro duodenal artery aneurysm constituting 47% of all cases followed by ethanol abuse accounting

for 25% of the cases, peptic ulcer disease (17%) and cholecystectomy (3%)^{12,13}.

In our study, interventional radiologist reported Post embolization that although the flow from GDA was stopped the aneurysm was still filling with flow from SMA. The procedure decreased pressure in aneurysm sac by some degrees. Clinically, most of the unruptured GDAs are asymptomatic. Rarely symptoms like upper abdominal pain, obstructive jaundice or iron deficiency anemia from chronic gastrointestinal blood loss may occur. Ruptured GDAs presents with haematemesis, melena, haemobilia, haemorrhagic shock or severe abdominal pain due bleed into the gastro-intestinal tract (GIT). Our patient presented with several episodes of bleeding per Rectum and 1 episode of haematemesis further suggesting that there was a rupture of the GDA.

CONCLUSION

Considering the rare occurrence of GDA aneurysm and pseudo aneurysm, it is rarely kept in the differentials as a cause of Upper GIT bleeding. OGD should be followed by an angiography when no significant pathological cause of the bleeding is found on OGD. Although angiographic coil embolization is an effective and safe treatment for most of the GDA aneurysm and Pseudo aneurysm, sometimes surgery becomes inevitable due to difficulty to cannulate the feeding artery during embolization.

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