CASE REPORT

Ruptured Celiac and Hepatic Artery Aneurysm with Bile Duct Fistula

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ABSTRACT

The overall incidence of a visceral aneurysm (VA) in the adult population is estimated to range from 0.1% to 2%, with hepatic artery aneurysm (HAA) being one of the more frequently observed types, 20%. Similarly, celiac artery aneurysm (CAA), a rare subset of visceral aneurysms, account for approximately 4% of cases. Visceral aneurysms are potentially life threatening without prompt surgical intervention.

A 58-year-old man presented with generalized body weakness and jaundice. CT angiogram showed a large lobulated aneurysm of the mid to distal celiac artery. An exploratory laparotomy confirmed the diagnosis of celiac and hepatic artery aneurysm with bile duct fistula and ligation of anuerysm, bile duct reconstruction, T-tube insertion with intraoperative cholangiogram was performed. The patient was discharged improved.

Keywords: Bile Duct Fistula, Celiac Artery Aneurysm, Hepatic Artery Aneurysm, Ruptured Aneurysm

INTRODUCTION

First described over 200 years ago, early case reports on visceral aneurysm primarily focused on emergency interventions for rupture.[1] An aneurysm is traditionally defined as the dilation of an artery exceeding 1.5 to 2 times its normal diameter.[2] The pathogenesis of true visceral aneurysms involves various factors, such as atherosclerosis, medial degeneration, collagen vascular disorders, and fibromuscular dysplasia.[3]

Visceral aneurysms (VAs) are rare vascular pathologies, with an estimated incidence of 0.1% to 2% in the adult population. Hepatic artery aneurysms (HAAs) constitute approximately 20% of reported cases, whereas celiac artery aneurysms (CAAs), a rarer subset, comprise about 4%.[4] Despite their infrequency, VAs carry a substantial risk of catastrophic rupture and death, underscoring the critical importance of early detection and prompt surgical management.

This case highlights the critical importance of prompt diagnosis and timely intervention in the management of visceral aneurysms. In this instance, early surgical treatment resulted in a favorable outcome without postoperative complications.

CASE REPORT

A 58-year-old male, who came in with a chief complaint of generalized body weakness and jaundice. A few days prior, patient noted onset of generalized body weakness associated with difficulty of breathing, easy fatigability and jaundice. Sought consult in a different institution, wherein whole abdomen CT scan with contrast showed a ruptured celiac artery aneurysm. Advised transfer to our institution. He was diagnosed with hypertensive atherosclerotic cardiovascular disease, coronary artery disease, heart failure, type 2 diabetes mellitus, controlled, PTB, clinically diagnosed. No history of previous surgery. No food and drug allergies. His family history was unremarkable.

Physical examination revealed jaundice, abdomen soft distended non tender, with 2+ bipedal edema. Given the history and physical examination, initial impression of a celiac artery anuerysm with probable bile duct fistula was considered.

The team proceeded with work up. Laboratory tests revealed a CBC of anemia with neutrophilic predominance. Electrolytes and creatinine were within normal limits. LFTs were slightly elevated. A CT angiogram of the aorta with IV contrast revealed a large irregularly lobulated aneurysm with segmental wall calcifications of the mid to distal celiac artery which measures 10.5 x 10.7 x 15.1 cm. No active contrast extravasation. The aneurysm was seen occupying the upper peritoneal cavity extending to the right periportal and subhepatic spaces (Figure 1). Large ascites with hemoperitoneum was noted. Dilated intrahepatic biliary tree but with normal sized common bile duct (Figure 2). Given the details above, primary working impression was ruptured celiac artery aneurysm with bile duct fistula.

Figure 1. CT angiogram of the aorta with IV contrast showing a loculated aneurysm measuring 10.5 x 10.7 x 15.1 cm.

At the emergency room, patient was placed on nothing per orem, IV fluids started, IV antibiotics given. The patient underwent exploratory laparotomy, ligation of anuerysm, bile duct reconstruction, T-tube insertion with intraoperative cholangiogram with findings of approximately

2 liters of hemoperitoneum and hematoma, huge celiac and common hepatic artery aneurysm, approximately 12 cm in widest diameter, with irregular lobulated shape, containing and surrounded by organized hematoma, adherent to the stomach, pancreas, gallbladder, and common bile duct. Gallbladder is distended containing thick bile sludge with microlithiases, common bile duct is dilated with noted fistula in the common bile duct and hepatic artery aneurysm.

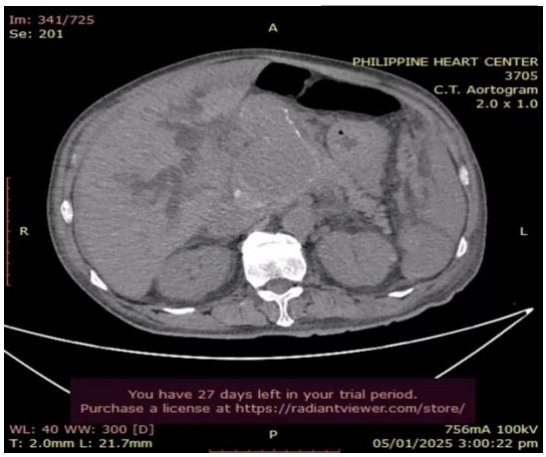

Figure 2. Dilated intrahepatic biliary tree with normal common bile duct seen on CT angiogram with contrast.

The patient was transferred to the surgical intensive care unit (SICU) postoperatively, then subsequently to the general ward. His diet was gradually progressed as tolerated. He was eventually discharged in stable condition, with an unremarkable postoperative course.

DISCUSSION

Visceral artery aneurysms are rare, with an overall estimated incidence in the adult population ranging from 0.1% to 2%. Among these, celiac artery aneurysms are the fourth most common, following splenic, hepatic, and superior mesenteric artery aneurysms. The estimated incidence of celiac artery aneurysms in the general population is approximately 0.005% to 0.01%. [5]

Due to their rarity and often asymptomatic nature, CAAs are frequently discovered incidentally during imaging studies conducted for other reasons. However, when they do present with symptoms, they can manifest as vague abdominal discomfort or pain and generalized weakness. As seen in the case, the patient presented with generalized body weakness and jaundice. HAAs may rupture into the biliary system, resulting in the formation of an arteriobiliary fistula, which can lead to jaundice.[6]

The evaluation of visceral aneurysms (VAs) involves a combination of imaging studies and clinical assessments to determine the appropriate management strategy. Computed Tomography Angiography (CTA) is the preferred initial imaging modality for diagnosing VAs due to its high resolution and ability to delineate vascular anatomy and aneurysm characteristics.[7] The authors were able to clinch the diagnosis with the help of the CT angiogram findings.

The most serious complication of visceral anuerysm is rupture, which carries a high mortality rate. Historically, rupture rates were reported between 72% and 87% in the early 20th century, but advancements in diagnostic imaging and early surgical intervention have significantly reduced this risk. [5]

The management of celiac artery aneurysms (CAAs) is guided by their size, symptomatology, and rupture risk. The Society for Vascular Surgery's 2020 guidelines recommend the treatment of non-ruptured celiac artery true aneurysms greater than 2 cm, those with a demonstrable increase in size, or those with associated symptoms. Emergent intervention is advised for any size aneurysm resulting in patient symptoms or rupture. Surgical treatment involves resection or closure of the aneurysm.[8]

CONCLUSION

Although rare, visceral artery aneurysms are clinically significant due to their potentially lethal clinical course. The advent of modern technology including imaging modalities has revolutionized the management of visceral aneurysm, significantly improving the likelihood of successful outcomes.

CONSENT

Written informed consent was obtained from the patient for publication of this case report and any associated images.

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