Celiac artery aneurysms: report of a rare case and brief review of literature

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javascript:void(0)**Celiac artery aneurysm: Report of a rare case and brief review of the literature**

Key clinical message

Celiac artery aneurysm is a rare and typically asymptomatic lesion that is defined as dilation of the celiac artery trunk by 1.5 times its normal diameter. Most are idiopathic and occur in the fifth decade of life. Imaging plays an important role in the diagnosis and identification of complications, such as expansion and thrombus formation. 20% of cases are also associated with additional visceral aneurysms, which imaging will help to localize. We present the case of an elderly male patient in whom we performed post-contrast computed tomography for a liver mass, which proved to be focal nodular hyperplasia, and diagnosed an incidental and isolated celiac artery aneurysm. We show the imaging findings and briefly review the literature. This case is important as it highlights how an imaging modality performed for an unrelated condition can diagnose a rare visceral artery aneurysm.

Key words: celiac artery aneurysm; computed tomography; splanchnic artery aneurysms

javascript:void(0)**Abbreviation:**

javascript:void(0)**CAA- Celiac Artery Aneurysm**

CT- Computed Tomography

MRI**-** Magnetic Resonance Imaging

Introduction

Celiac artery aneurysms are rare vascular lesions and account for only a small proportion of all aneurysms (1, 2). Patients are usually asymptomatic. If symptoms do occur, they are nonspecific and include vague epigastric pain, back pain, and uncommonly nausea and vomiting. A worsening abdominal pain usually suggests either a rapidly expanding aneurysm or rupture, the most devastating complication (4-5, 7). Diagnosis is usually incidental, as most patients are asymptomatic. CT and MRI are the imaging modalities of choice. For those who have surgical indications, preoperative angiography should be performed (1, 5).

Clinical history

A 76-year-old male patient presented with chronic right upper quadrant pain of 1 year duration. The patient has no history of chronic medical illnesses or previous hospitalizations. He also has no undue fatigue, abdominal swelling, weight loss, or appetite change. On presentation, his vital signs were in the normal range. On deep liver palpation, there was tenderness.

Investigations

AFP was normal at 8.93 ng/mL. Liver function tests showed a raised aspartate aminotransferase (73 U/L), normal Alanine aminotransferase (44 U/L), and ALP (233 U/L). Direct (0.24 mg/dl) and total (0.57 mg/dl) bilirubin were normal. A complete blood test revealed a white blood count of 5.5 x 1000/uL and hemoglobin levels of 12.7 g/dl. Renal function tests were also within the reference range, with creatinine measuring 0.75 mg/dL and BUN measuring 25 mg/dL.

Abdominal ultrasound revealed a large, lobulated right liver mass. A triphasic CT scan of the abdomen revealed a centrally non-enhancing mass that involves segments VI and VII and showed arterial and portal venous phase enhancement and washout on delayed phase (Figure 1). An incidental fusiform dilation, measuring 1.73cm in transverse dimension, of the celiac artery just after its takeoff is seen (Figures 1A, 1B and 2). The splenic, common hepatic, and left gastric arteries were seen separately arising from this fusiform dilation. No intramural filling defect or mural calcification was seen. Under aseptic precautions, an ultrasound-guided core needle biopsy of the right liver mass revealed focal nodular hyperplasia with no malignant features.

Treatment and follow-up

After proving the right liver mass is not of a malignant nature, regular follow-up with abdominal ultrasound is planned every 6 months. We will also serially measure the dimensions of the celiac artery to document any increase in size.

Discussion

Celiac artery aneurysms are rare vascular lesions with an estimated incidence in the overall population ranging from 0.005% to 0.2% (1). They make up about 4% of visceral artery aneurysms and less than 0.01% of all aneurysms (2). Like all other splanchnic artery aneurysms, they are defined as a localized dilation of the mesenteric vasculature greater than 1.5 times the normal diameter of an artery (3). Patients with these lesions often present with associated aneurysms. Approximately 18% to 20% will have an aortic aneurysm, and 18% to 38% will have a second visceral artery aneurysm. 18% to 67% of patients have aneurysms in their peripheral arteries. Our patient doesn't have aneurysms in the aorta or the abdominal visceral vessels.

Celiac artery aneurysms are frequently asymptomatic. Patients may present with vague epigastric or back pain. Other areas of pain, such as the left lower quadrant (4, 5), can also occur. Worsening abdominal pain usually indicates either a rapidly expanding aneurysm or rupture. Food ingestion can aggravate abdominal pain in some cases, suggesting intestinal angina. Nausea and vomiting occur in 21% of patients (1, 6). Occasionally, symptoms may arise as a result of compressing adjacent structures, such as dysphagia from esophageal compression (7, 8).

A rupture is the most serious complication of celiac artery aneurysms. Reports indicate a low risk of rupture, approximately 13%. The mortality rate reaches 100% (1, 7). The factors that might stratify that risk have not been identified. A study by Stone et al. showed that comorbid conditions, aneurysm calcification, presence of thrombus, aneurysm size, and sex did not correlate with the risk for rupture (10). On the other hand, Vasconcelos et al. suggest that pregnancy and increasing diameter may be considered aggravating factors. However, there are no established predictors of rupture (1). Other documented complications include thromboembolic complications (7).

Graham et al. did a literature review on patients with celiac artery aneurysm. They proposed a distinction between cases that occurred before the historical period and those that occurred after 1950 (the contemporary period), taking into account factors such as etiology and clinical importance. Among 60 celiac artery aneurysms encountered before 1950, representing the historic era, 40% were infectious, 7% were traumatic, and 52% were of undetermined cause. The majority exhibited symptoms, 87% experienced ruptures, and 95% received their diagnosis during postmortem examinations. Since 1950, the contemporary era has consisted of 48 cases. Congenital or developmental medial defects of the arterial wall and atherosclerosis were the most common causes of aneurysms (9). Saliou et al. propose that tuberculosis, syphilis, Takayasu's arteries,

fibromuscular dysplasia, trauma, and mycotic bacterial infection are complications of infective endocarditis, frequently associated with a mesenteric artery aneurysm (8). We found no evidence in the literature that benign or malignant liver lesions cause CAAs. Most aneurysms in the contemporary period were either asymptomatic or accompanied by vague abdominal discomfort. Reports indicated a low risk of rupture (8, 9). The demographic analysis revealed that historically, the male-to-female ratio was 9:1, and the mean age of affected patients was 39.7 years. More recent reports showed no difference in the male-to-female ratio, with an average age at presentation of 52.3 years (1, 9).

Given that the majority of patients remain asymptomatic, the diagnosis of celiac artery aneurysm typically occurs incidentally during imaging procedures conducted for unrelated conditions. As CT imaging becomes more prevalent in the emergency room, we can anticipate a rise in the incidence of CAAs. Abdominal radiographs may show calcification on the aneurysm's wall, but celiac artery aneurysm diagnosis necessitates other diagnostic modalities such as ultrasonography, CT scanning, or magnetic resonance angiography. Angiography should be part of the preoperative evaluation to get a better idea of the aneurysm's shape and to find out more about the distal vasculature and collateral circulation so that the best treatment can be chosen (1, 5).

Stone et al. recommended elective repair in good-risk patients with aneurysms of greater than 2 cm (10). Vecchia and Blazar recommended surgical repair for symptomatic aneurysms larger than two cm, those expanding more than 0.5 cm annually, and asymptomatic women of childbearing age (5).

javascript:void(0)**Informed Patient Consent**

Written informed consent was obtained from the patient for anonymized patient information to be published in this article.

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Ethics statement

This is a case report and therefore did not require ethical approval from the ethics committee

Author contribution

Bereket Girum Beyene: Conceptualization; data curation; formal analysis; investigation; methodology; project administration; resources; software; supervision; validation; visualization; writing – original draft; writing – review and editing. **Michael Teklehaimanot Abera:** Conceptualization; software; Writing – original draft; writing – review and editing. **Mesay Gebrekidan;** writing – review and editing; software. **Abdi Alemayehu Dhuguma:** Conceptualization; Data curation; investigation; resources; supervision; validation; writing review and editing.

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