



Giant celiac artery aneurysm: Treatment by transcatheter coil embolization

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ABSTRACT

Celiac artery aneurysms (CAA) are one of the rarest forms of visceral artery aneurysms. Most patients are asymptomatic at the time of diagnosis and aneurysms are detected incidentally during diagnostic imaging for other diseases. We present the case of a 42-year-old man who had an asymptomatic giant CAA detected incidentally by an abdominal ultrasound investigating an abdominal pain. A contrast enhanced computed tomography angiogram (CTA) revealed a large CAA measuring 7.1 cm × 4.3 cm with extensive collaterals from the superior mesenteric artery (SMA). The aneurysm sac was mostly filled with thrombus with the celiac artery branches occluded. Pre-procedural angiography and transcatheter embolization procedures were performed at the same session. Endovascular exclusion was performed by transcatheter coil embolization and packing of the aneurysm sack. Technical success was achieved by the absence of flow in the aneurysm, and preservation of the native circulation on angiograms obtained just after the transcatheter coil embolization procedure. One week postembolization, a CTA confirmed thrombosis of the aneurysm. The patient returned for a follow-up CTA 3, 6, 12 and 48 months after embolization. The aneurysm was thrombosed and the patient remained asymptomatic. The surgical mode of treatment of CAA is increasingly being replaced by endovascular embolization because of the lower morbidity and mortality and high success rate. The accepted endovascular approach is by coil embolization of the aneurysmal lumen, the proximal and distal aneurysmal neck, or both.

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1. Introduction

Aneurysms of the celiac trunk are the rarest forms of aneurysms of visceral arteries with only 108 cases were reported in the literature by 1985.^{1,2} Due to the increased use of sonography, computed tomography and arteriography, more cases have been diagnosed in the recent past.² Early recognition and intervention are crucial as the operative mortality rate associated with ruptured celiac artery aneurysms (CAA) is 40% compared with only 5% for elective repair.¹ We present a case of a large CAA that was diagnosed incidentally with an abdominal ultrasound. Successful repair was achieved by coil embolization.

2. Case report

A 42-year-old man was referred to our institution for further management of a large CAA. He presented to a private hospital with an abdominal epigastric pain for few days. To investigate the cause of his complaint, an abdominal ultrasound was performed and showed a large visceral artery aneurysm (VAA) most likely originating from the celiac artery. No other abnormality was detected. There was no history of trauma, fever, abdominal or chest infections. He had no history of oral or genital ulcers, and unremarkable medical and family history. At the time of presen-

tation to our hospital, the patient was afebrile with normal vital signs. Abdominal examination revealed a large pulsatile mass in the left hypochondrium. Rest of the general physical examination was unremarkable. Routine laboratory investigations were within normal limits. A contrast enhanced computed tomography angiogram (CTA) with a 64-row multidetector scanner revealed a large CAA measuring 7.1 cm × 4.3 cm with extensive collaterals from the superior mesenteric artery (SMA). The aneurysm sac was mostly filled with thrombus with the celiac artery branches occluded (Figs. 1 and 2). After the CTA, we elected to treat the aneurysm with coil embolization. In endovascular exclusion, it is quite controversial to seal the orifice of the celiac trunk because of the possibility of visceral ischemia. Before proceeding with endovascular exclusion, we believed that there was a minimal possibility of visceral organs ischemia in this patient due to the formation of visceral collateral circulations from SMA, esophageal and diaphragmatic arteries, among others. Pre-procedural angiography and transcatheter embolization procedures were performed at the same session. A selective visceral angiogram through the femoral artery was performed which confirmed that the aneurysm was originating from celiac trunk with no branches originating from the sac and extensive SMA collaterals (Fig. 3A). Endovascular exclusion was obtained by transcatheter coil embolization and packing of the aneurysm sack (Fig. 3B). Technical success was achieved by the absence of flow in the aneurysm, and preservation of the native circulation on angiograms obtained just after the transcatheter coil embolization procedure. The patient was asymptomatic after the procedure and discharged four days after admission, two days

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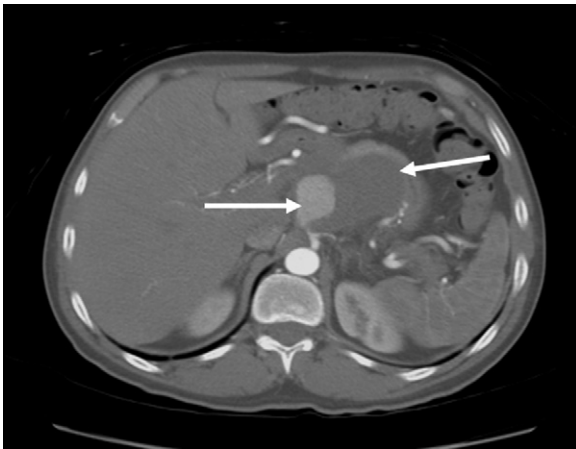


Fig. 1. A contrast-enhanced computed tomographic aortogram showed a 7.1 × 4.3-cm size celiac aneurysm with a large intramural thrombus (*top arrow*) and a small active lumen (*bottom arrow*).



Fig. 4. A 2-year follow up contrast-enhanced computed tomographic aortogram, showing the aneurysm still thrombosed with patent collaterals.

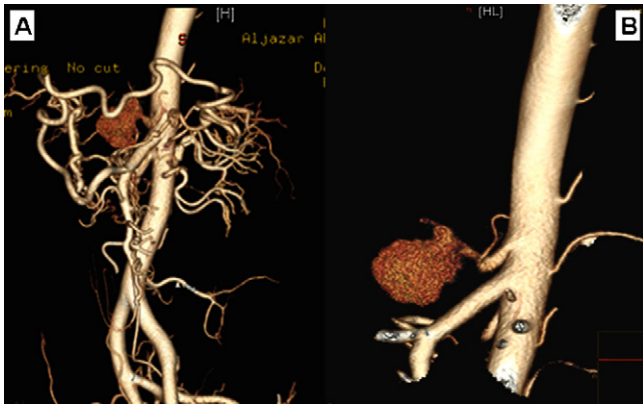


Fig. 2. A volume rendered 3D computed tomographic aortogram image demonstrating the celiac aneurysm, and the massive collaterals (A) and active flow in the lumen with no branches (B).

post embolization. One week post-embolization, a CTA confirmed thrombosis of the aneurysm. The patient returned for a follow-up CTA 3, 6, 12 and 48 months after embolization. The aneurysm was thrombosed and the patient remained asymptomatic (*Fig. 4*).

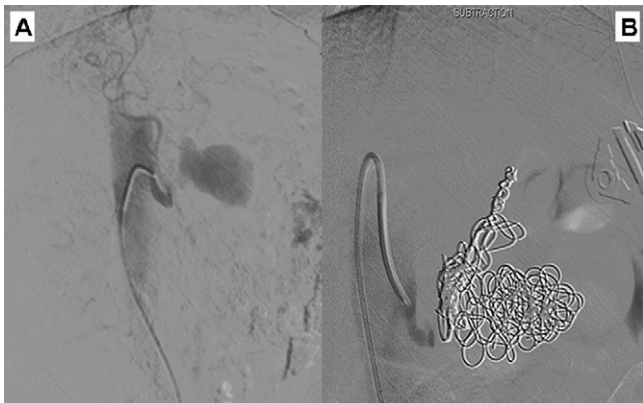


Fig. 3. A selective digital subtraction angiography confirming the lumen of the aneurysm with absence of branches (A) and no flow post coil embolization (B).

3. Discussion

VAA are rare, with an incidence of 0.01–0.2% in routine autopsies.³ CAA is a rare condition that accounts for approximately 4% of all VAA.^{1,4} Advances in abdominal imaging techniques have led to an increase in the detection rate of VAA.⁵ The most common pathologic finding is medial degeneration and atherosclerosis. Traumatic aneurysms due to penetrating injuries, post-stenotic dilatation occasionally progressing to frank aneurysmal changes, mycotic and Behçet’s disease are all rare causes.^{6–8} Most VAA are asymptomatic and only 22% are detected before they rupture, where abdominal discomfort localized to the epigastrium accompanies more than 60% of symptomatic CAA.^{2,9} These lesions are apparent as pulsatile abdominal masses in nearly 30% of the cases.¹ Many of the VAA are detected incidentally as a curved calcification on plain abdominal radiograph or as a vascular mass on ultrasonography, computerized tomography scan (CT) or magnetic resonance imaging (MRI). The diagnosis, however, is usually established with selective arteriogram and, recently, on CTA.⁹ The early detection and effective treatment are necessary to improve the prognosis.¹⁰ Management options include observation for small aneurysms, surgical repair, endovascular treatment with catheter-based embolization, and in selected patients, stent-graft therapy.⁵ Surgery is the conventional treatment of VAA, and its efficiency and durability are well documented with a mortality rate of 5% for elective repair.^{2,4} Mortality in operative treatment of patients with ruptured CAA is 40% compared with only 5% for those with elective repair.¹ The surgical mode of treatment is increasingly being replaced by endovascular embolization because of the lower morbidity and mortality and high success rate.^{5,10–12} The accepted endovascular approach is by coil embolization of the aneurysmal lumen, the proximal and distal aneurysmal neck, or both. There are case reports of endovascular stent-graft repair in VAA.^{13–17}

There are no data or reports in the literature about a celiac aneurysm with the same criteria as our patient (large size, isolated, with thrombosed branches, large intramural thrombus, small active lumen and all the visceral blood supply is provided by extensive collaterals mainly from the SMA). These criteria excluded the risks of VAA embolization complications in our patient which include persistent perfusion, and end organ infarction.^{5,11} In view of that and that endovascular coil embolization repair compared to surgical repair is minimally invasive, with low complication rate, and is associated with a decreased length of stay averaged 2.4–1.6 days compared to 6.6–4.7 days of elective surgical repair,⁵ we chose the embolization approach for our patient.

Conflict of interest

None.

Funding

None.

Ethical approval

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

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