

# Management of a rapidly expanding celiac artery aneurysm with the chimney technique

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## ABSTRACT

Infective celiac artery aneurysm is an extremely rare diagnosis, with few reported cases in the literature. We present the case of a rapidly expanding celiac artery aneurysm involving the ostia, probably infectious, successfully treated in an urgent setting by aneurysm exclusion resorting to the chimney technique. On follow-up, computed tomography angiography revealed complete aneurysm thrombosis and patent celiac artery. Previous reports of endovascular treatment of infective celiac artery aneurysm involved its embolization. This is the first reported case of chimney technique used to exclude a celiac artery aneurysm, with a clinical suspicion of infectious etiology, preserving celiac artery patency. Short-term results are encouraging, but implantation of prosthetic material in an infected environment is a concern. (*J Vasc Surg Cases and Innovative Techniques* 2018;4:252-6.)

**Keywords:** Aneurysm; Infected; Celiac artery; Endovascular procedures

Visceral artery aneurysm is an infrequent but potentially lethal condition. The most commonly involved vessels are the splenic, hepatic, and superior mesenteric arteries, in decreasing order of frequency. Aneurysms of the celiac artery represent <4% of the aneurysms of visceral vessels, and most are atherosclerotic in etiology. Isolated infective celiac artery aneurysm (ICAA) is an exceedingly rare diagnosis.<sup>1-7</sup>

We describe a case of a rapidly expanding celiac artery aneurysm involving the ostia, probably infectious, successfully treated by aneurysm exclusion resorting to the chimney technique.

## METHODS

Relevant medical data were collected from the hospital database regarding the clinical case. A review of the literature was also performed using the MEDLINE database. The patient's consent was obtained for case publication.

## RESULTS

The patient is a 54-year-old man with medical history of arterial hypertension and immunoglobulin A nephropathy in chronic kidney disease stage 5 on hemodialysis. A left radial-cephalic arteriovenous fistula (AVF) was created in 2010, and he was started on regular

hemodialysis 2 years later. Since 2014, cannulation has been performed by the buttonhole technique, with no previous history of AVF local or systemic complications, namely, infection.

In September 2017, he was referred to the emergency department because of lumbosacral pain, asthenia, anorexia, and fever in the last 4 days. There were no respiratory, gastrointestinal, or genitourinary symptoms. Physical examination revealed a particularly frail patient, with no remarkable findings other than mild abdominal epigastric pain. The AVF had no clinical signs of infection.

Serologic evaluation revealed anemia (hemoglobin, 8.0 mg/dL), thrombocytopenia ( $74 \times 10^9/L$ ), normal white blood cell count, and elevated C-reactive protein (13.28 mg/dL; normal, <3.0), with no other significant finding. Findings on thoracic radiography were normal. He was admitted to the medical ward because of fever of unknown origin for further study and started on broad-spectrum antibiotherapy.

Blood cultures were positive for methicillin-sensitive *Staphylococcus aureus* (MSSA), and antibiotherapy was accordingly adjusted. Transthoracic echocardiography revealed no vegetations or any other data suggestive of endocarditis.

Computed tomography angiography (CTA) was performed to exclude spondylodiscitis. The examination was negative for that clinical suspicion but revealed a saccular aneurysm of the origin of the celiac artery, 17 mm in maximum diameter (Fig 1, A). Three days later, repeated CTA revealed aneurysm growth to a maximum width of 32 mm (Fig 1, B and C).

The aneurysm was interpreted as impending for rupture, and an urgent endovascular procedure was planned in the angiographic suite with aneurysm exclusion, resorting to the chimney technique. Percutaneous bilateral femoral artery access and surgical exposure of the right brachial artery were obtained. The celiac artery

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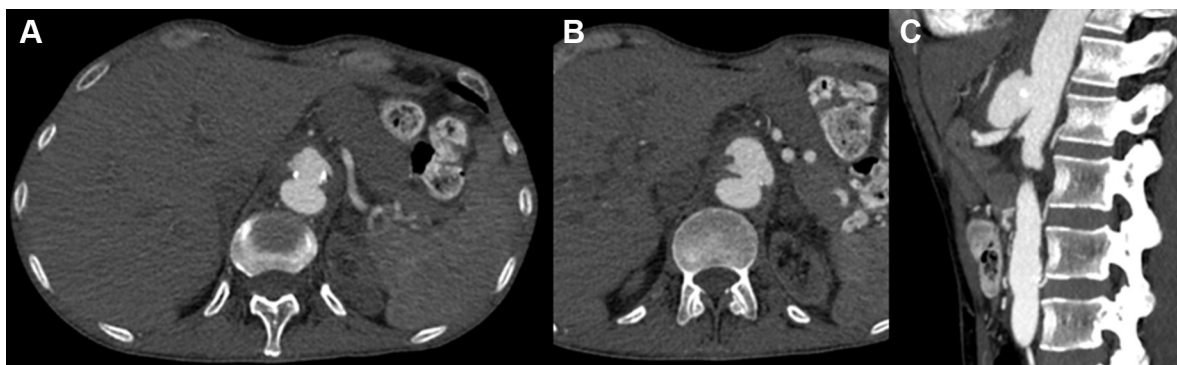
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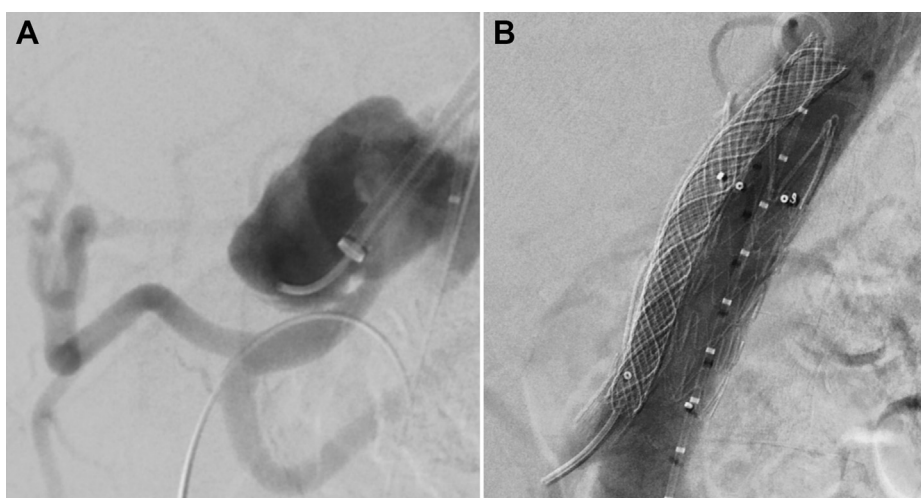
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**Fig 1.** **A**, Computed tomography angiography (CTA) performed to exclude spondylodiscitis, revealing an aneurysm of the origin of the celiac trunk, 17 mm in width. **B**, Axial view of repeated CTA performed 3 days later, revealing aneurysm growth to 32 mm. **C**, Sagittal view of repeated CTA performed 3 days later, revealing aneurysm growth to 32 mm.



**Fig 2.** **A**, Digital subtraction angiography revealing saccular aneurysm of the origin of the celiac trunk. **B**, Final angiogram after chimney technique exclusion of infective celiac artery aneurysm (ICAA) revealing patent distal celiac artery and successful aneurysm exclusion.

was selectively catheterized from the right brachial access, and diagnostic angiography was performed (Fig 2). Subsequently, a sheath was positioned distal to the aneurysm. The superior mesenteric artery ostium was 14 mm distal to the celiac trunk and was also selectively catheterized from the left femoral access; an Amplatz guidewire (Boston Scientific, Marlborough, Mass) was positioned to avoid accidental superior mesenteric artery occlusion. An Endurant II (Medtronic, Santa Rosa, Calif) endoprosthesis (28 × 28 × 49 mm) was positioned in the aorta above the superior mesenteric artery through right femoral access. A Viabahn (W. L. Gore & Associates, Flagstaff, Ariz) stent graft (10 × 100 mm) was positioned and released in the celiac artery, excluding aneurysm and protruding into the aorta. The chimney technique was completed with the release of the previously positioned aortic

endoprosthesis. Control angiography revealed a slight kink in a segment of the Viabahn stent graft protruding above the aortic endoprosthesis. Accordingly, radial force strengthening with Wallstent (10 × 70 mm; Boston Scientific) was performed. Final angiography revealed patent distal celiac artery and successful aneurysm exclusion (Fig 2). Right brachial access was surgically closed, right femoral access was closed with the Perclose ProGlide suture-mediated system (Abbott Vascular, Abbott Park, Ill), and left femoral access was closed with manual compression.

The patient did well after the procedure, becoming afebrile after 5 days of antibiotherapy, with sustained decrease in inflammatory markers. He maintained mild epigastric pain that gradually subsided. CTA was performed 5 days after the procedure and revealed a well-positioned endoprosthesis, with no endoleak (Fig 3). After

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