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BRIEF COMMUNICATION

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Successful conservative treatment of an isolated inflammatory superior mesenteric artery aneurysm

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Abstract

Inflammatory superior mesenteric artery aneurysm is an extremely rare but life-threatening condition that can result in fatal rupture. Early surgery has been emphasized to prevent aneurysm rupture. We present a case that was successfully managed with conservative treatment. The patient was treated with intravenous methylprednisolone pulse therapy followed by oral prednisolone. Steroid therapy should be considered for unruptured inflammatory superior mesenteric artery aneurysms before surgery.

Keywords: Aneurysm • Superior mesenteric artery • Inflammatory

VASCULAR

INTRODUCTION

Superior mesenteric artery (SMA) aneurysms are uncommon clinical entities. They account for 6.9% of all visceral artery aneurysms [1] and are clinically important because of severe complications, including rupture and embolism. SMA aneurysms are associated with high rates of rupture and death [1, 2]. Inflammatory SMA aneurysms are exceedingly rare [3]. To our knowledge, only several cases of inflammatory SMA aneurysms have been reported in the literature [3–6]. There is no consensus regarding therapeutic strategy. Early open or endovascular surgery has been emphasized recently [3–5]. Herein, we report the first case of successful conservative treatment.

CASE

A 28-year-old man was admitted to our hospital with dull, persistent abdominal pain of 7 days of duration. No fever was noted, and the physical examination was unremarkable. He denied alcohol abuse, drug addiction, hypertension and any family history of aneurysm. There was no history of abdominal trauma, surgery or infection. Laboratory tests showed elevations in his erythrocyte sedimentation rate (71 mm/h) and C-reactive protein level (21.6 mg/dl), while the white blood cell count and procalcitonin level were within normal limits. Blood culture showed no bacterial growth. Autoantibody tests, including antineutrophilic cytoplasmic antibody or rheumatoid factor, were all negative. The levels of immunoglobulin and complement were normal. Computed tomographic (CT) angiography revealed a 36-mm saccular SMA aneurysm with thickening of the surrounding tissue (Fig. 1A and B) and excluded other aneurysmal or occlusive lesions in the aorta and visceral branches. Conventional SMA angiography confirmed the findings on CT angiography (Fig. 1C). Rheumatology and immunology consultations aided in the diagnosis of inflammatory SMA aneurysm.

The patient was treated with intravenous methylprednisolone pulse therapy for 3 days (1 g/d) followed by oral prednisolone (1 mg/kg/day). His abdominal pain resolved gradually from the second day after steroid therapy. Aneurysm repair was indicated due to its nature and size and was planned after the inflammation was controlled. During this period, emergency surgery was prepared if the aneurysm ruptured. Three weeks after steroid therapy, the patient was well and his inflammatory markers returned to normal limits. Aneurysm repair was scheduled; however, repeat CT angiography revealed complete thrombosis of the aneurysm with a thick arterial wall (Fig. 2A). Symptoms of intestinal ischaemia, such as early satiety and abdominal pain with eating, were denied. Aneurysm repair was abandoned. He was discharged from the hospital and the prednisone dosage was tapered.

At the 12-month follow-up, the patient was in good condition without ischaemia of the bowel or evidence of recurrence. Blood inflammatory markers remained within normal ranges. CT showed that the thrombosed aneurysm had obviously shrunk, with a thin arterial wall, and the ileocolic artery was supplied by collateral circulation (Fig. 2B and C). The patient was followed up closely to monitor potential disease recurrence, including abdominal symptoms, inflammatory markers and abdominal imaging. He continued to receive oral prednisolone (10 mg/day) as suggested by the rheumatologist to prevent relapse.

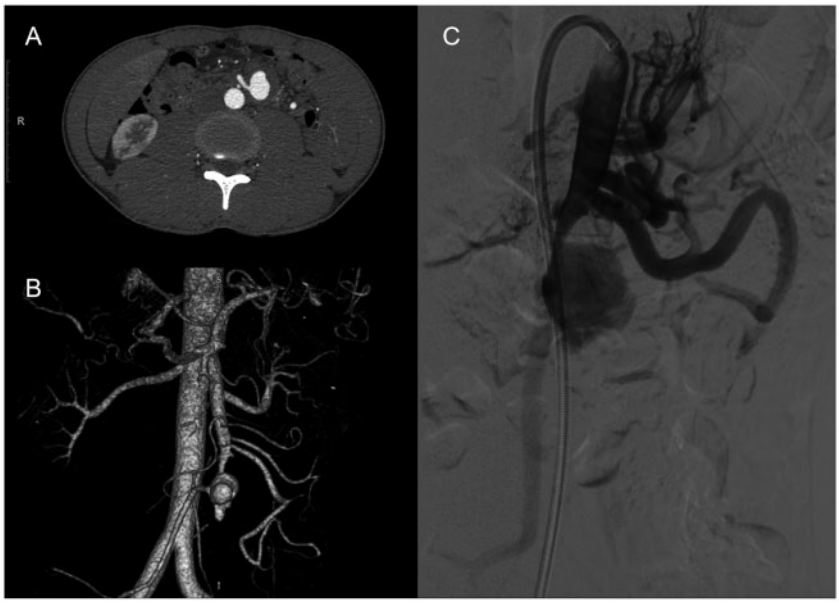

Figure 1: Images of an inflammatory aneurysm of the superior mesenteric artery before steroid therapy. (**A** and **B**) Computed tomographic images show a saccular aneurysm of the superior mesenteric artery with thick surrounding tissue. (**C**) Selective superior mesenteric artery angiogram demonstrates the computed tomographic findings.

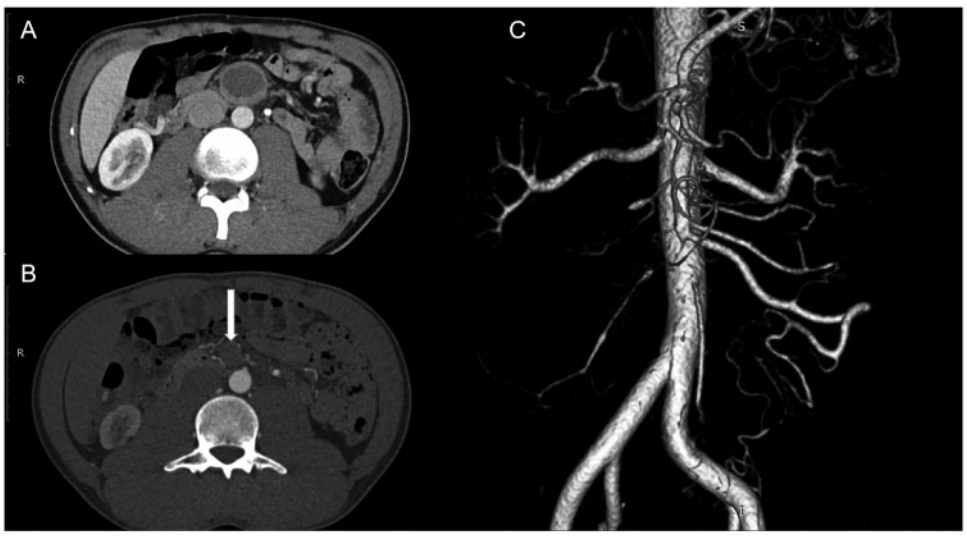

Figure 2: (**A**) Computed tomographic angiography at 3 weeks after steroid therapy reveals complete thrombosis of the aneurysm, with a thick arterial wall. (**B**) A computed tomographic image at the 12-month follow-up shows that the aneurysm (white arrow) had shrunk obviously. (**C**) A computed tomographic image with 3-dimensional reconstruction reveals occlusion of the aneurysm and patency of the ileocolic artery.

DISCUSSION

The aetiology of SMA aneurysms remains unclear. Atherosclerosis, infection, trauma, inflammation, fibromuscular dysplasia, collagen vascular disorders and arterial dissection have been noted to be associated with SMA aneurysms [3, 7]. Bacterial infection was considered the main cause in the past [8]. However, most SMA aneurysms were of unknown cause in recent series [1, 2]. Atherosclerosis was the most common pathologic finding in these patients, while it is believed to be a secondary event [1]. Recently, arterial dissection has been considered the most common cause of aneurysmal degeneration of the SMA [9]. In this case, arterial inflammation is considered the potential cause of the SMA aneurysm.

Histopathologic examination remains the gold standard in the diagnosis of inflammatory SMA aneurysms [3, 4]. It was not performed because of conservative treatment in this case. The diagnosis of an inflammatory SMA aneurysm was established based on clinical judgement. First, our patient had abdominal pain, which is the most common symptom in patients with inflammatory aneurysms [10]. Second, the inflammatory markers were elevated, which was consistent with inflammatory aneurysms [3, 4]. Third, CT showed a saccular aneurysm with arterial wall thickening. This is the typical radiological feature of inflammatory aneurysms [3]. Fourth, steroid therapy was effective in the current case. Abdominal pain, inflammatory markers and radiological presentations were all improved after steroid therapy. These findings were also consistent with inflammatory aneurysms [10]. In

addition, other potential causes, such as infection, trauma and arterial dissection, were excluded. Thus, an inflammatory aneurysm of the SMA was diagnosed clinically in the present case.

For inflammatory SMA aneurysms, there is no consensus on therapeutic management because of the rarity of the disease. In the literature, most previous cases were treated surgically with or without anti-inflammatory treatment [3–6, 10]. Anti-inflammatory treatment was not used due to unrecognized inflammation or aneurysm rupture [3, 5]. For this case, steroid therapy was employed to control the acute inflammation. Meanwhile, aneurysm repair was indicated because of its nature and size (36 mm). Open surgery usually consisted of resection of the lesion and end-to-end anastomosis. Endovascular treatment included covered stent repair, balloon-assisted embolization, bare-metal stent implantation with embolization and flow diverter placement. Both open and endovascular treatments were technically feasible and could be selected for the patient. Open surgery was associated with definitive effects and large trauma. Endovascular treatments were minimally invasive but expansive. Endovascular repair is recommended because of lower morbidity that may be probably higher in inflammatory SMA aneurysms.

For ruptured inflammatory SMA aneurysms, emergency surgery is usually required regardless of disease activity [4]. However, there is no consensus on operation timing for unruptured aneurysms. The main postoperative complications in the acute stage include acute thrombosis and pseudoaneurysm formation at the anastomosis or stent-graft edge. Thus, in the current case, surgery was planned after the inflammation was controlled. To date, no standard time interval from the initiation of steroid therapy to surgery has been described in the literature [5–9]. Three weeks were required to control inflammation in the present case. Fortunately, the aneurysm resolved spontaneously after steroid therapy without surgery; because the aneurysm sac was completely thrombosed. To the best of our knowledge, this is the first successful case of conservative treatment. We considered the following factors that may underlie thrombosis of the sac, including arterial inflammation, intimal injury after SMA catheterization, irregular shape of the aneurysm and steroid therapy.

In conclusion, this report presents a successful case of conservative treatment for an isolated inflammatory SMA aneurysm. Inflammatory SMA aneurysms should be considered in young patients with SMA aneurysms and elevated inflammatory markers. Conservative management with steroids should be considered in addition to surgical treatment for unruptured inflammatory SMA aneurysms. More cases are required to verify the significance of steroid therapy for inflammatory SMA aneurysms.

Conflict of interest: none declared.

Data Availability Statement

All relevant data are contained within the present manuscript.

Reviewer information

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REFERENCES

[1] Stone WM, Abbas M, Cherry KJ, Fowl RJ, Gloviczki P. Superior mesenteric artery aneurysms: is presence an indication for intervention. J Vasc Surg 2002;36:234–7; discussion 237.
[2] Jiang J, Ding X, Su Q, Zhang G, Wang Q, Jian W *et al.* Therapeutic management of superior mesenteric artery aneurysms. J Vasc Surg 2011;53:1619–24.
[3] Dorigo W, Pulli R, Innocenti AA, Anichini C, Azas L, Barbanti E *et al.* Isolated inflammatory aneurysm of superior mesenteric artery: unexpected pathologic diagnosis. J Vasc Surg 2004;39:903–5.
[4] Matsumoto T, Ishizuka M, Iso Y, Kita J, Kubota K. Mini-laparotomy for superior mesenteric artery aneurysm due to Takayasu's arteritis. Int Surg 2015;100:765–9.
[5] Choo CH, Yen HH. Unusual upper gastrointestinal bleeding: ruptured superior mesenteric artery aneurysm in rheumatoid arthritis. World J Gastroenterol 2013;19:4630–2.
[6] Bibiche Y, Kanjaa N. [Aneurysm of the superior mesenteric artery revealing Behçet's disease: report of a case]. Pan Afr Med J 2015;20:312.
[7] Silvestri V, Sapienza P, Ossola P, Grande R, Brachini G, Sterpetti AV *et al.* Ruptured superior mesenteric artery aneurysm due to fibromuscular dysplasia: a rare vascular presentation in a patient with schizophrenia. Ann Vasc Surg 2019;58:384.e5–e8.
[8] Stanley JC, Wakefield TW, Graham LM, Whitehouse WM, Zelenock GB, Lindenauer SM. Clinical importance and management of splanchnic artery aneurysms. J Vasc Surg 1986;3:836–40.
[9] Patelis N, Doukas P, Dodos I, Karampelas T, Kanellopoulos I, Kyriakopoulou K *et al.* Endovascular repair of a complex isolated dissecting aneurysm of the superior mesenteric artery. EJVES Short Rep 2019;44:5–8.
[10] Kakehi E, Adachi S, Fukuyasu Y, Hashimoto Y, Yoshida M, Osaka T *et al.* Superior mesenteric artery vasculitis in Behçet's disease: a case report and literature review. Intern Med 2019;58:127–33.