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Case Report

Superior mesenteric artery aneurysm: treatment with endovascular techniques: case report

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ABSTRACT

Superior mesenteric artery aneurysms (SMAA) are rare and associated with a high risk of rupture, morbidity and mortality. Their clinical presentation is heterogeneous, turning the clinical diagnosis into a difficult task-which can delay their treatment. We present a case of a patient with a SMAA, treated successfully with coil embolization.

Keywords: Visceral artery aneurysm, Superior mesenteric artery, Endovascular techniques

INTRODUCTION

Visceral artery aneurysms (VAA) are rare clinical entities, with an approximate incidence of 0, 01%-2%; with the increasing use of computed tomographic (CT) scans, their incidence has been rising.[1-4] Superior mesenteric artery aneurism (SMAA) is the third most frequent VAA (5, 5%), falling behind splenic and hepatic aneurysms (60 to 70 % and 20%, respectively).[4,5]

We report a case of a 30-year-old woman, who was admitted to our hospital with acute abdominal pain. SMAA was diagnosed and the patient underwent successful elective endovascular treatment with coil embolization.

CASE REPORT

A 30-year-old obese woman submitted to bariatric surgery 15 days before presented to the emergency room complaining of abdominal pain for 12 hours.

The pain had a sudden onset, with no fluctuation in intensity, located in the epigastrium and right hypocondrium and with no relieving factors. Physical examination showed a tender superior abdomen at deep palpation, with no signs of peritonism. She was hemodynamically stable, with no fever. Laboratory tests were unremarkable (without leukocytosis or neutrophilia and negative C-reactive protein).

Abdominal ultrasound showed a 2 cm rounded anechogenic formation, adjacent to the superior mesenteric artery, with internal flow present on a Doppler study, raising the suspicion of an aneurysmal dilatation.

An abdominal angio-CT scan confirmed an aneurysm in the dependence of the superior mesenteric artery's emergence, with about 2×1.8 cm (Figure 1).

We choose an elective endovascular approach and, after 15 days of the initial diagnosis, aneurysm embolization was performed with 14×34 mm microcoils, using right femoral access. Post-embolization angiogram showed no endo-leak, with good flow in SMA and its distal branches (Figure 2).

The post-operative period ran smoothly and on a follow-up appointment (3 months later) the patient was asymptomatic.

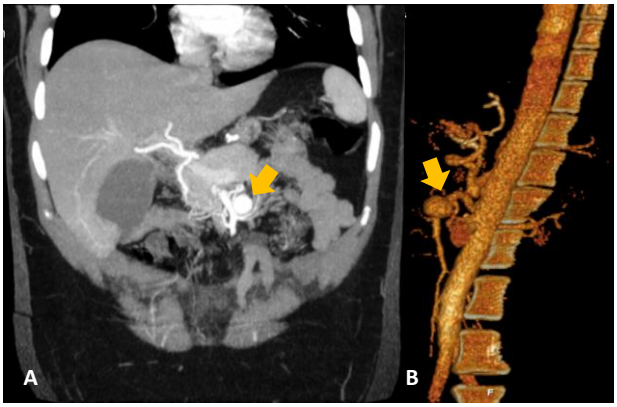

Figure 1: Angio CT revealing SMAA (arrows) (A) coronal view; and (B) sagittal view.

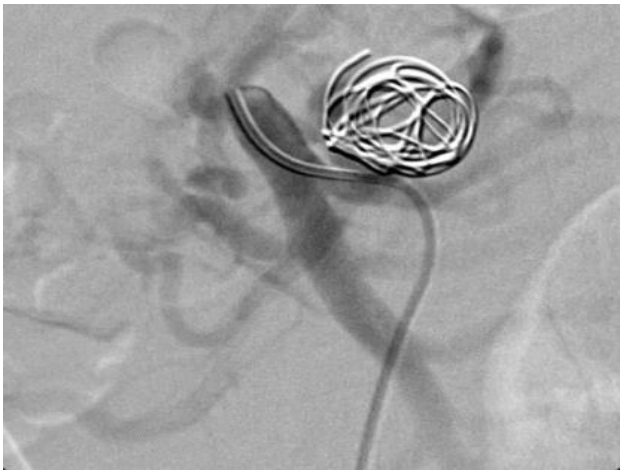

Figure 2: Post-embolization angiography revealing an aneurysm filled with coils, with flow in the SMA and distal branches.

DISCUSSION

SMAAs are rare but potentially life-threatening entities with high risk of rupture, morbidity and mortality.[6-8] Most commonly they involve the proximal 5 cm of the SMA.[9] Men and women are affected equally.[4] In the past, bacterial infection emerged as the main cause due to septic emboli (e.g., endocarditis).[4,10-12] Currently, infectious SMAAs are found less often, mainly to the widespread antibiotic usage. According to Stone's study 4, less than 5% of the SMAs are of infectious etiology. Recent studies reported that most SMAA have unknown etiology, with atherosclerosis being the most common known cause, especially in the elderly; other authors consider that atherosclerosis most likely represents a secondary event.[4,13-16] Other more rare etiologies include polyarthritis nodosa, Behçet syndrome, systemic lupus erythematosus, systemic connective tissue disorders, vasculitis, trauma, cystic medial necrosis and neurofibromatosis.[4,17,18]

In the presented case there seems to be no obvious identifiable etiology-the patient's only risk factor was obesity, which relates to atherosclerosis; however, we don't believe it to be the most likely cause in a young patient.

The previous bariatric procedure could be the cause, but there are no cases in the medical literature that co-relate bariatric surgery with SMAA. Other causes, such as vasculitis or collagen disorders, are left unexplored, since the patient didn't have any signs or symptoms that required further investigation. Therefore, we believe a congenital cause is most likely, even though we cannot determine that for sure.

SMAAs are difficult to detect through physical examination and clinical history is usually nonspecific, which can lead to a delay/error in diagnosis. Increasingly, aneurysms have been diagnosed in asymptomatic patients, identified as incidental findings on abdominal imaging tests (particularly on CT or angio-CT scans performed for other reasons).[9,19-21] Stone et al and Jiang et al report that reality in 48% and 70% of asymptomatic patients, respectively.[4,13] The clinical presentation can be heterogeneous, but abdominal pain remains the most common symptom. It may arise associated with nausea, vomiting, a pulsatile mass or gastrointestinal bleeding. Other patients present with hemodynamic instability (secondary to aneurysmatic rupture) or with ischemic symptoms.[14] The potential for rupture remains poorly defined and its frequency is not consistent in the various studies; however, if rupture occurs, the mortality rate may reach 60%.[4,14,22]

Due to the rarity of SMAA and absence of controlled studies, there is no strong enough evidence to establish guidelines. Therefore, management is based solely on observational studies.[23,24] However, the treatment is usually indicated for symptomatic SMAA or asymptomatic SMAA with a diameter >2 cm/ rapid growing (more than 0.5 cm/year).[24-26] Intervention strategies include surgery (open or laparoscopic), endovascular techniques or any combination of these modalities.[27] SMAA treatment should be individualized and based on the characteristics of the patient (age, gender, symptoms and comorbidities) and of the aneurysm (size, etiology).[17,28]

In 1953, De Bakey and Cooley reported the first successful surgical treatment of SMAA, which consisted of aneurysm resection without revascularization.[29] Open surgery continues to be considered the "gold standard" for SMAAs 18, but the endovascular treatment has significantly gained importance with success rates between 70-97%.[2,4,19,31-33]

Compared to open surgery, endovascular therapies are associated with lower morbidity and mortality, shorter hospital stay and a better perioperative quality of life; late complications may arise, namely thrombosis and infection.[34,35] These techniques are particularly useful in patients with severe abdominal adhesions from prior laparotomies, high surgical risk, or for aneurysms in locations that are difficult to approach surgically.[10,30,36]

CONCLUSION

SMAA, though rare, are life-threatening conditions that require an early diagnosis, especially if symptomatic, rapidly growing and/or big (>2 cm). Open surgical repair is considered "gold standard" treatment; however, endovascular techniques have been growing as valid alternatives, with elevated success rates being described in the literature. Nonetheless, further studies are required to demonstrate long-term results.

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