International Journal of Cardiovascular and Thoracic Surgery
2021; 7(3): 30-33
http://www.sciencepublishinggroup.com/j/ijcts
doi: 10.11648/j.ijcts.20210702.14
ISSN: 2575-4866 (Print); ISSN: 2575-4882 (Online)

Rare Triple Presentation of Tuberculous Mycotic Aortic Aneurysm

Kiruthika Shanmugam[1, *], Shivdasani Ravi[1], Gopal Murugesan[1], Vijit Koshy Cherian[1], Karthik Maruthachalam[2]

[1]Department of Cardiothoracic and Vascular Surgery, Madras Institute of Orthopaedics and Traumatology International Hospital, Chennai, India

[2]Department of Surgical Gastroenterology, Madras Institute of Orthopaedics and Traumatology International Hospital, Chennai, India

Email address:

aashiwanti@gmail.com (K. Shanmugam)

[*]Corresponding author

To cite this article:

Kiruthika Shanmugam, Shivdasani Ravi, Gopal Murugesan, Vijit Koshy Cherian, Karthik Maruthachalam. Rare Triple Presentation of Tuberculous Mycotic Aortic Aneurysm. *International Journal of Cardiovascular and Thoracic Surgery*. Vol. 7, No. 3, 2021, pp. 30-33.
doi: 10.11648/j.ijcts.20210702.14

Received: January 22, 2021; **Accepted**: June 28, 2021; **Published**: July 8, 2021

Abstract: Mycotic Abdominal Aortic Aneurysm (MAAA) is a rare entity that accounts for around 2% of aortic aneurysms. Tuberculous involvement of the aorta is either through hematogenous route or by the way of direct extension of disease from the adjacent structures. It may affect the intima or several layers of the vessel wall resulting in inflammation of the aorta, termed as aortitis, which weakens the aortic wall. The variable immune response to this aortitis can thicken the aorta or can perforate it leading to aneurysm formation. Tuberculosis affects both abdominal and thoracic aorta equally. Neither medical treatment nor surgical repair is curative, when used alone. The various surgical techniques which have been used by the investigators, had refined over period of time and importance of complete clearance of the infective foci is emphasized. Despite advanced imaging techniques, anti-tubercular drugs and adequate surgical options in the present times, the prompt diagnosis and successful repair of tuberculous MAAA are very few in number and there is also possible risk of reactivation of tuberculous process and recurrence. A presentation of a combination of Pott's spine, psoas abscess and tubercular MAAA is a rare entity with very high mortality. We report the successful surgical and medical treatment of this precarious presentation.

Keywords: Tuberculosis, Mycotic Aortic Aneurysm, Pott's Spine, Psoas Abscess

1. Introduction

The term 'mycotic aneurysm' was first used by Sir William Osler in 1885 to describe aortic aneurysm with morphological fungal resemblance [3-5, 12]. The term is a misnomer because it commonly develops through microbial inoculation of the diseased aortic endothelium, commonly by bacteria and rarely by fungus. Despite the fact that tuberculosis (TB) is prevalent in the developing countries, its involvement of the spine, also termed as Pott's spine occurs in less than 1% of all TB cases. Around 86% of MAAA was associated with Infective endocarditis [2]. Thus, occurrence of tubercular MAAA is exceedingly rare. The first case of tuberculous MAAA was reported in 1895 by Kamen [2]. The first successful resection of thoracic tuberculous aneurysm was by DeProhetis et al in 1959, which had ruptured into the lung [12]. The natural history of a MAAA is rapid progression to rupture and death in 80% of the cases. The patient may present initially with persistent pain related to the location of the aneurysm. Only 40% of patients developed classical manifestations of MAAA which are fever, abdominal pain and pulsatile abdominal mass, hemoptysis or other evidence of massive bleeding. In majority, diagnosis was made based on combination of clinical evidence of infection and imaging [1]. Failure to isolate *M tuberculosis* from patients suspected of having tuberculous aortitis on the basis of clinical features and typical histological picture does not exclude the diagnosis of active tuberculosis [13, 6]. No patients survived tubercular MAAA in the pre-antibiotic era. Inspite of modern imaging

techniques, anti-tubercular drugs and vascular grafts, successful repair of tubercular MAAA are very few in number.

2. Case Report

A female patient aged 64 years, having type II diabetes mellitus and hypertension, was referred to us with complaints of intermittent abdominal pain, low grade fever, loss of weight and appetite since 3 months. She had no contact history for tuberculosis (TB). The Computed Tomography (CT) scan revealed L2 and L3 lumbar vertebral osteomyelitis and abscess arising from the lower border of L2 vertebra extending along the length of left psoas muscle (figure 1). She was diagnosed as Pott's spine with psoas abscess and was started on AntiTubercular Treatment (ATT). One month after initiation of ATT, she complained of left flank and lower abdominal pain. She was clinically worsening. Repeat CT scan showed pseudoaneurysm from the posterolateral wall of aorta measuring 8x7x5 cms at the level of L3 vertebra during follow up and there were features suggestive of TB lymphadenitis too.

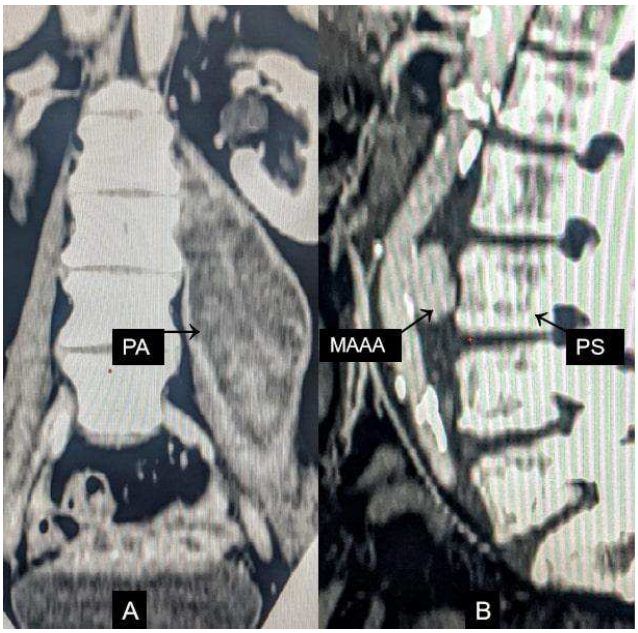

Figure 1. *CT scan of the coronal (A) and sagittal (B) sections revealing, left psoas abscess (PA) pseudoaneurysm (MAAA) arising from the posterior wall of abdominal aorta and Pott's spine (PS).*

Ultrasound guided aspiration of psoas abscess was done and she was referred to our hospital for surgical management of pseudoaneurysm. Investigations revealed elevated ESR, lymphocytosis and normal liver function test. Blood culture was sterile. No organisms were detected on Gram staining of sputum. Sputum culture was sterile and it was negative for Acid Fast Bacilli (AFB). After continuing ATT for two more weeks and medical stabilisation, consent for surgery was obtained and it was decided to proceed with surgical management.

Under general anesthesia, through midline laparotomy incision, the left paracolic gutter was exposed. The abdominal aorta was dissected and looped, proximal clamp was applied on infrarenal aorta. The aneurysmal sac was completely excised after evacuating clots and debris followed by drainage of left psoas abscess. A 14x7 mm bifurcated knitted polyester collagen coated (Intergard – Maquet Cardiovascular LLC, NJ, USA.) graft was used as an interposition graft, proximally anastomosed to infrarenal aorta with 4-0 polypropylene continuous sutures and distally to either common iliac arteries with 5-0 polypropylene continuous sutures. The graft was soaked in rifampicin solution before suturing, in view of the infected environment. The omentum was mobilized and wrapped around the graft. Histopathological Examination (HPE) of the aorta and adherent soft tissue revealed xanthogranulomatous inflammation. Tissues sent for culture and PCR were negative for AFB. Patient was reviewed by the Pulmonologist and was advised to continue ATT for nine months. She made a gradual recovery.

Intravenous antibiotics were continued for three weeks as part of infective endocarditis protocol. She remained hemodynamically stable, well ambulant and afebrile. She was discharged on the twenty-fifth postoperative day. Complete blood count, C-reactive protein, renal and liver function tests were normal at discharge. A year after surgery, she is back to normal life with satisfactory results on review. Review CT scan showed aorto-iliac interposition graft with good distal vascular flow (figure 2).

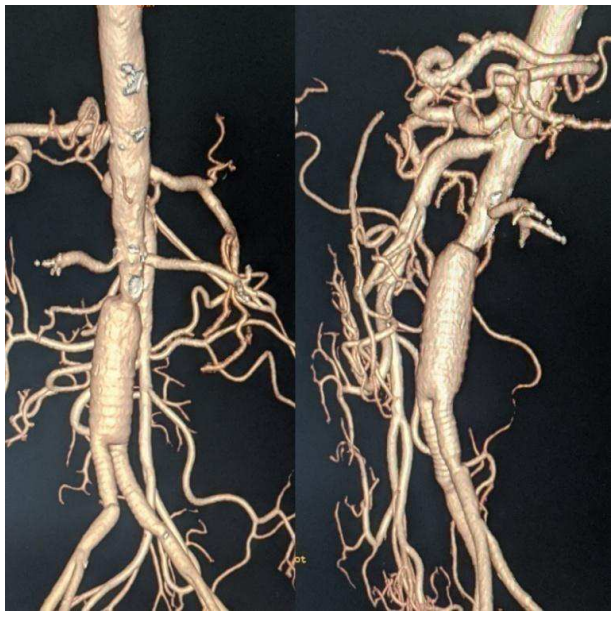

Figure 2. *Postoperative CT scan showing aorto-iliac Y graft.*

3. Discussion

The first attempted surgical repair of tubercular MAAA was performed by Herndon in 1949, but the patient had an early postoperative death [3]. In 1955, Rob and Eastcott used Orlon cloth graft to reconstruct the aorta damaged by aortic aneurysm which was the first successful repair of this condition without evidence of complications on follow-up [4].

Tubercle bacilli may reach the aortic wall by either direct implantation of the bacilli on the endothelium in patients suffering from military TB; the bacilli may be carried to the adventitia or media by the vasa vasorum or through their lymphatics or direct transfer from the nearby focus of infection like lymph node, abscess or the bone. In our case, contiguous focus from vertebral TB and psoas abscess probably caused aortitis, which progressed to pseudoaneurysm. Tuberculous MAAA are usually a consequence of transmural perforation caused by direct extension to the vessel from contiguous focus. It is mainly caused by inflammatory reactions surrounding the arteries. The aorta is the most frequent site of localization. Both thoracic and abdominal aorta are equally affected. Revascularization and fibrosis may lead to adhesions between blood vessels and surrounding tissues. Caseating necrosis, involving the entire thickness of the aortic wall which results in perforation, either with massive hemorrhage or with the formation of a perivascular hematoma. The latter becomes encapsulated and retain communication with the lumen, which is referred as pseudoaneurysm. Surgical treatment becomes challenging because of the difficulty of separating adhesions with encircling blood vessels, which also increases the risk of aneurysmal rupture [4]. Hence, once a patient is suspected of having this disease, initial ATT is recommended to ensure that the antibiotic has penetrated the surrounding tissues thereby reducing the incidence of postoperative complications and mortality rate. The surgical treatment should be performed early once the diagnosis of tuberculous pseudoaneurysm is confirmed, regardless of the size. Delayed management or non-management of mycotic pseudoaneurysms is associated with high mortality due to dreaded complications like rupture of aneurysm and fulminant sepsis.

In India Choudhary et al [5], in their study concluded that MAAA should be highly suspected in patients with diagnosed tuberculosis presenting with rapid deterioration in clinical status as it was the most marked clinical feature.

The surgical treatment options are in-situ or extra-anatomic reconstruction with debridement. In the presence of infection, endovascular stent graft exclusion or EndoVascular Aneurysm Repair (EVAR) is not recommended, as this does not allow extensive excision and debridement of the infected tissues. We preferred the technique of excision of the aneurysmal sac and reconstruction with interposition grafts. The debridement is important part of the surgery which helps in eliminating the necrotic tissue and also improves the efficiency of medical and surgical treatment [2-11].

Long et al [2] reviewed the literature since 1945 and described 41 cases of tuberculous aneurysms, of which 24 were treated by a combined medical and surgical therapy. In all 24 cases, in situ or extra-anatomic reconstruction and debridement of periaortic tissues was followed by prolonged antituberculous drug therapy. With this combined medical and surgical approach, the mortality rate was only 14%.

Vogt et al [14], reported use of cryopreserved arterial homograftstor replace infected segments of major thoracic and abdominal vessels in 12 patients as an effective treatment for mycotic aneurysms and graft infections. G. A. Sicard et al [11], reported use of superficial femoral vein alone or in combination with saphenous vein for reconstruction in case of prosthetic aortic graft infections to create a new aortoiliac system.

Labrousse et al [8], reported endovascular repair of a tuberculous aneurysm of the descending thoracic aorta. Reccurence occurred shortly after discontinuation of ATT which led to fatal aortic rupture. The classical duration of ATT may be less likely to eradicate infection in the presence of prosthesis. Prolonged administration of ATT for 12 months was indicated in cases of recurrence [13] or even lifelong medical treatment when surgical treatment of the residual tuberculous lesion cannot be achieved [8].

In astudy by Razavi et al [15], although the 30-day mortality rate associated with the use of stent-grafts appears to be lower than that associated with surgery, late aneurysm-related events are frequent and warrant a more vigilant follow-up.

4. Conclusion

High index of suspicion is the key to diagnosis in these patients who do not always present with classical symptoms. Once the diagnosis of tuberculous pseudoaneurysm is confirmed, an aggressive strategy of combined surgical and medical treatment leads to satisfactory outcomes for this lethal condition.

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