Case Report

Internal mammary artery pseudoaneurysm: A rare fatal complication of tubercular empyema

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ABSTRACT

Vascular complications in the chest due to tuberculosis (TB) involve the pulmonary as well as bronchial vasculature. Mycotic pseudoaneurysms of internal mammary artery (IMA) are a sparsely reported clinical entity in the literature occurring due to TB. We report a rare case of IMA pseudoaneurysm due to the tubercular empyema in a patient with massive hemoptysis who was treated by endovascular coil embolization; however, the patient died due to refractory shock.

KEY WORDS: Internal mammary artery, pseudoaneurysm, tuberculosis

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INTRODUCTION

Tuberculosis(TB) is a very common infectious disease, especially in the developing countries and primarily a pulmonary disease. Vascular complications in the chest, involving the pulmonary as well as bronchial vasculature are known to occur due to tubercular infection.[1] Mycotic pseudoaneurysm of internal mammary artery (IMA) is a sparsely reported clinical entity in the literature.[2-4] We, herein report a rare case of IMA pseudoaneurysm due to the tubercular empyema in a patient with massive hemoptysis.

CASE REPORT

A 15-year-old male had complaints of fever and cough with expectoration on and off for 8 months. On evaluation, sputum was found positive for acid fast bacilli and he was on anti-tubercular treatment (ATT, Directly Observed Treatment Short course, Category II) for the last 3 months.

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He had small amounts of blood-streaked sputum for the past 2 weeks, but had coughed up approximately "a cup" of bright red blood a day prior to his referral to emergency department. While still in the emergency, he had an episode of large volume hemoptysis, estimated to be approximately 200-250cc of fresh blood. The patient had a past history of TB 6 years back, for which he had taken a complete course of ATT for 6 months.

The patient underwent computed tomographic bronchial angiography (CTBA) to identify the cause of hemoptysis. The CTBA showed approximately 45 mm × 35 mm × 32 mm sized contrast filled outpouching seen arising from the left internal mammary artery (LIMA) in relation to one of the pocket of empyema located anteriorly in the paramidline location [Figure 1a and b]. In addition, multiple other loculated pockets of empyema were also seen. Multiple coalescing centrilobular nodules were seen scattered in bilateral lungs [Figure 1c], suggestive of reactivation.

Patient became hemodynamically unstable with falling blood pressure and went into shock. The decision was taken for angioembolization of the pseudoaneurysm. The LIMA was selectively cannulated, which showed contrast filled outpouching [Figure 2a] with faint abnormal blush. Three multiple curled soft platinum coils (2.0-2, 3.0-3 and 3.0-3) were deployed and the check angiogram showed no residual pseudoaneurysm [Figure 2b].

Hemoptysis stopped post-procedure; however, the patient went into refractory shock. The patient was given

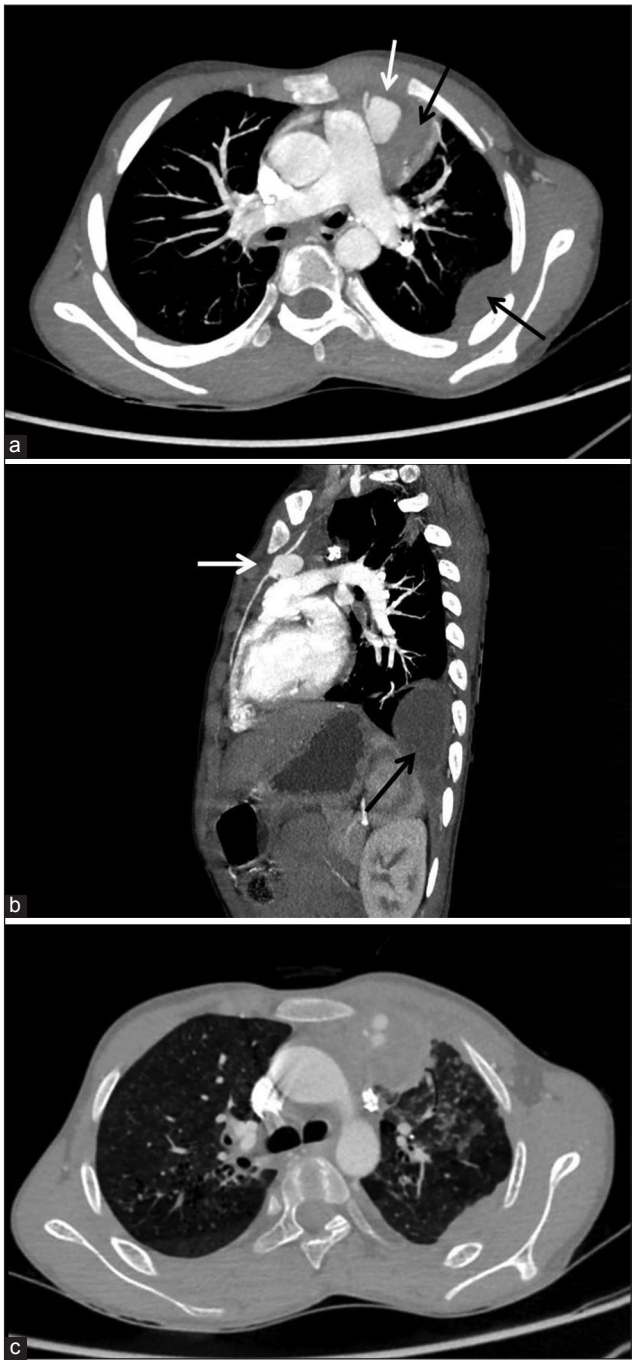

Figure 1: Axial (a) and sagittal (b) multiplanar reformatted images of computed tomography angiography showing contrast filled outpouching (white arrows in a and b) suggestive of pseudoaneurysm within the loculated empyema arising from left internal mammary artery. Multifocal pockets of loculated empyema are also seen (black arrows in a and b). The lung window sections (c) showing coalescing centrilobular nodules in bilateral upper lobes

crystalloids (in the form of normal saline) and whole blood. As the patient was not responding to the intravenous fluid resuscitation, he was started on vasoactive agents also (noradrenaline and dopamine). However, he could not be revived and died 4 h post-embolization.

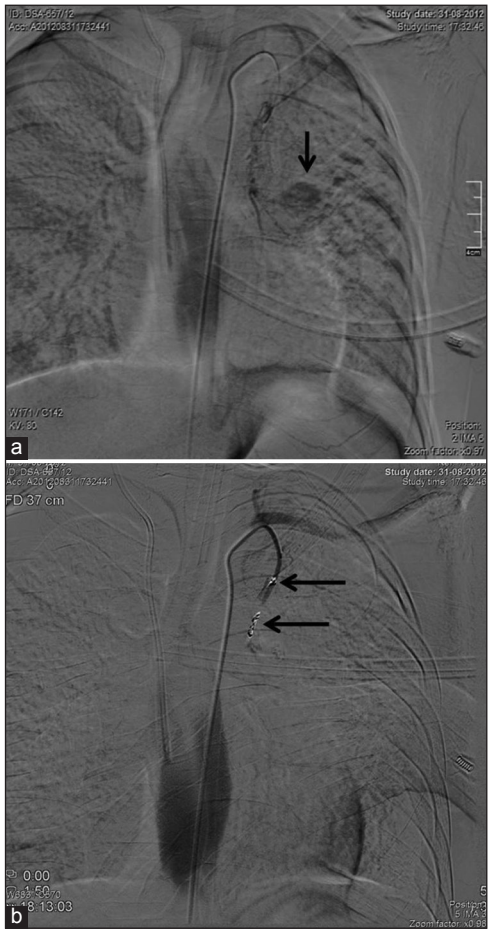

Figure 2: Angiography run of left internal mammary artery (a) showing contrast filled outpouching (black arrow) suggestive of pseudoaneurysm. Post-coiling angiography run (b) shows non opacification of distal artery as well as pseudoaneurysm. Coils are seen *in situ* (black arrows in b)

DISCUSSION

TB is a very common infectious disease, especially in the developing world. It is commonly caused by *Mycobacterium tuberculosis* (*M. tuberculosis*) through droplet infection. Pulmonary as well as extrapulmonary organs can be involved depending on the host defense mechanism as well as the virulence of the organism.[1] Tubercular infection in the chest can involve pulmonary as well as extrapulmonary portions, which include pleura, mediastinal structures and chest wall. A variety of sequelae as well as complications involving the pulmonary as well as extrapulmonary sites are seen, occurring in both treated as well as untreated patients.

Vascular complications involving the pulmonary and bronchial vessels are seen including arteritis and thrombosis, hypertrophy of the bronchial arteries and Rasmussen aneurysm. These complications may result from direct involvement by *M. tuberculosis* of the vascular wall or as a consequence of contiguous spread from a tuberculous mass.[5] *M. tuberculosis* can

primarily involve the vessel wall in the area of active infection which may result in arteritis, thrombosis or the pseudoaneurysm formation.[1,6] Replacement of adventitia and media by the granulation tissue leads to progressive weakening of the arterial wall. Fibrin gradually replaces the granulation tissue which results in thinning of the arterial wall, pseudoaneurysm formation and subsequent rupture.[1] We believe that the same pathological process was the likely cause of the pseudoaneurysm formation in our index case.

IMA pseudoaneurysm is a sparely reported vascular abnormality, with isolated cases described previously following sternotomy, vascular access procedures and trauma.[7] Still rarer is the formation of mycotic pseudoaneurysm following the chest wall infection by staphylococci, actinomycosis, TB or fungi.[2-4] Deshmukh *et al*.[2] reported IMA pseudoaneurysms in two children secondary to abscesses in the chest wall caused by TB and staphylococcus. Sanchez *et al*.[3] reported IMA pseudoaneurysm due to chest wall infection caused by invasive *Aspergillus fumigatus*. Wani *et al*.[4] reported a case of thoracic actinomycosis, which initially started as an area of consolidation and later invaded the chest wall leading to IMA pseudoaneurysm. The pocket of tubercular empyema located anteriorly was the cause for formation of mycotic pseudoaneurysm in our case.

Endovascular embolization, the currently favored treatment procedure for management of symptomatic IMA pseudoaneurysm is an effective and safe alternative to conventional surgical management.[8,9] Transcatheter embolization is done by either placing the coils within the pseudoaneurysm or embolizing the feeding vessel proximal to pseudoaneurysm.[10] Embolization of the LIMA was performed in our case by deploying the coils within the LIMA proximal to pseudoaneurysm with no evidence of filling of pseudoaneurysm seen in the angiographic run taken post-deployment of coils.

Though the endovascular procedure was successfully completed, the patient went into refractory shock, could not be revived and died.

To conclude, mycotic pseudoaneurysm of IMA is a very rare and a fatal complication of tubercular empyema. Endovascular embolization is a safe and effective approach for its treatment.

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