from the contiguous focus was the most likely mechanism. According to the same author, combined medical and surgical management should be used to offer the best chance of cure. Surgical treatment is required in all symptomatic patients and in mycotic aneurysm because of the fear of rupture. The majority of the cases are done on CPB with circulatory arrest [3]. In post-cardiac surgery patients, repeat sternotomy carries a risk of catastrophic bleeding, hence CPB by peripheral cannulation is preferred. In our case, we started with sternotomy, but since the aneurysmal aorta was badly adherent, we decided to establish bypass by femoral artery and the right atrium. We used moderate hypothermia in general; however, we utilized transient circulatory arrest at 25°C to perform distal anastomosis under blood-less fields to improve the accuracy. Bojar et al. [5] have reported the use of homografts to replace diseased aortas to avoid foreign objects. However, due to the non-availability of biological material, we used the Dacron tube graft. The histology of the tissue sent intraoperatively or correlation with history. In our patient, there was a history of antituberculous therapy for pulmonary tuberculosis; gross features were suggestive of tuberculosis with a supportive histological report. Despite the fact that it is rare, the most common cause of ascending aortic mycotic aneurysms is previous open heart surgery. Our patient did not have surgical intervention in the past; however, there was history of treated pulmonary tuberculosis. Tuberculous pseudoaneurysm of the ascending aorta is extremely rare. Even in a country like Pakistan where the burden of tuberculosis is enormous, there are very few reports of cardiac involvement like endocarditis, pericardial abscess and pericarditis, and this is a first report of an ascending aortic pseudoaneurysm. However, Sachin et al. from another region with increased prevalence of tuberculosis have suggested that it is not uncommon if suspected in appropriate clinical setting and they have reported 8 cases of tuberculous involvement in various parts of the aorta including 1 having a pseudoaneurysm of the ascending aorta [3]. Similarly, tuberculous involvement in the arch of the aorta and successful treatment using CPB have been reported in an immunocompromised patient and in a patient with a history of travelling to a place where tuberculosis was considered to be out of control [4]. In our patient, one of the symptoms at presentation was haemoptysis, and on chest X-ray a lung mass was perceived. A further evaluation with CT scanning revealed a pseudoaneurysm. Long et al. [2] in their review of the tuberculous aneurysm of the entire aorta in general, described three mechanisms of the way tubercle bacilli reached the aortic wall. In our patient, the extension

**CONFLICT OF INTEREST:** none declared.

**REFERENCES**


eComment. Aortic aneurysms secondary to tuberculosis

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doi: 10.1093/icvts/ivt331

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We read the paper by Shahabuddin and Sami with great interest [1]. They reported the successful treatment of a large tuberculous pseudoaneurysm of the ascending aorta. Aortic aneurysms are rare complications of tuberculosis and give rise to various issues related to their diagnosis and treatment. We would like to comment briefly on this topic.

Tuberculosis may cause a wide range of clinical presentations due to its disseminating property by contiguity or haematogenously. Aortic involvement secondary to tuberculosis is exceedingly rare and may be in the form of an arteritis or an aneurysm [2-4]. Tuberculous aneurysms of the aorta usually present as rapidly growing or ruptured pseudoaneurysms. Most of these aneurysms are of the pseudoaneurysm type.

Travel, migration, multiresistant strains, marginalized populations (e.g., the homeless or addicts), and immunosuppression, particularly concomitantly with acquired immunodeficiency syndrome are important factors that contribute to the spread of tuberculosis.
tuberculosis [3]. Because of these factors, cardiovascular surgeons may be more frequently confronted with this pathology.

Tuberculous involvement of the aortic wall may occur by mostly direct extension from contagious lesions such as infected lymph nodes, empyema, pericarditis, vertebral or paraspinal abscess and by hematogenous or lymphangitic dissemination from primary focus [2-4]. Almost all the segments of the aorta may be involved. The sites of involvement include the ascending aorta, the distal aortic arch, proximal descending thoracic aorta, distal descending thoracic aorta, and the infrarenal abdominal aorta [2-4]. However, the areas in close proximity to the mediastinal and paraaortic lymph nodes are more commonly involved.

Tuberculous aortic aneurysms are diagnosed using clinical symptoms, chest X-ray, computed tomographic scans, cardiovascular magnetic resonance and angiogram [2-4]. One should have a high index of suspicion and an aneurysm should be suspected in patients with active tuberculosis if they deteriorate suddenly or if a mass lesion is present. Tuberculous aortic aneurysms are prone to rupture abruptly and therefore treatment is recommended as soon as possible. The accepted treatment of these aneurysms is a combination of antimycobacterial therapy and surgery. Neither medical treatment nor surgery is curative, if used alone. There are various surgical options including extra-anatomic bypass, in situ insertion of an aortic conduit and patch closure, or direct closure [2-4]. Histopathologic study and culture of the tissue from the aneurysm wall should be a routine procedure for the correct drug choice in these complicated patients. Surgery is associated with high rates of postoperative complications, such as wound infection, nosocomial bacteremia, early prosthetic graft infection, bleeding, cerebrovascular events and respiratory problems.

Recently, endovascular treatment has emerged as an alternative to surgery for these aneurysms. Han et al. [5] reported a case of a 54-year old woman with miliary tuberculosis incidentally found to have a mycotic aneurysm of the descending aorta that was successfully treated with antimycobacterial medical treatment and endovascular stent-graft placement with complete resolution of the pseudoaneurysm at 1 year.

In conclusion, we think that early diagnosis and appropriate surgical or endovascular repair are necessary to successfully manage patients with these complicated aneurysms.

Conflict of interest: none declared

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