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TEVAR for thoracic mycotic aneurysm: Case report

Ayoub Bounssir[a,*], Asmae Jedar[a], Amine Azghari[b], Hanae Bouhdadi[c], Tarik Bakkali[a], Brahim Lekehal[a]

[a] Vascular surgery department, Ibn Sina University Hospital center, Université Mohammed V, faculté de médecine et de pharmacie de Rabat, 10104, Souissi, Rabat, Morocco
[b] Cardiovascular surgery department, Ibn Sina University Hospital center, Université Mohammed V, faculté de médecine et de pharmacie de Rabat, 10104, Souissi, Rabat, Morocco
[c] Vascular surgery department, Centre Hospitalier Universitaire Tanger-Tétouan-Al Hoceima, Université Abdelmalek essaidi, faculté de médecine et de pharmacie Tanger, Route de Rabat Km 17 BP 398, Gzinaya, Tanger, Morocco

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ABSTRACT

INTRODUCTION: *Mycobacterium tuberculosis* is a cause of mycotic aortic pseudoaneurysms, wich are a rare case with high mortality rates. Three types of dissemination hematogenous by contiguity and direct to the aortic wall are possibles.
PRESENTATION OF CASE: We report a rare case of tuberculous thoracic aortic pseudo aneurysm, successfully treated endovascularly associated to antituberculosis drugs.
DISCUSSION: Classically TB pseudoaneurisms have been treated with open surgical therapy.however, they are associated to high morbidity and mortaity with increased lenghts of hospital stay. Due to advancements of endovascular technology, it be cames a good and successful alternative as a treatment, with a background of medical treatment.
CONCLUSION: Thoracic endovascular aneurysm repair (TEVAR) associated to anti-tuberculosis medication have revolutionized the management and improved the prognosis of this pathology.

1. Introduction

Even though tuberculosis is still a prominent public health issue in developing countries, tuberculous (TB) aortic pseudoaneurysms are rare with high mortality rates. Since 1945, only 44 cases were reported [1], their preferential distribution concerns the descending thoracic aorta in patients with disseminated tuberculosis; regardless of their diameter they expose to a high risk of unpredictable rupture that can be lethal [2].

The goal of the treatment of TB aneurysms is to avoid rupture of the aorta and to eliminate TB infection.

The gold standard treatement was surgery with high risks, but endovascular have completely changed and improved the management and the outcomes of thoracic aneurysm.

We present a case of an 75-year-old woman suffering from a thoracic mycotic aneurysm treated by Thoracic endovascular aneurysm repair (TEVAR).

The challenge in our case is to manage the exclusion of the aneurysm and avoid the infection of the endograft.

2. Case report

A 75-year-old woman with a medical history that included miliary pulmonary tuberculosis associated to a tuberculous spondylodiscitis, who was on anti-mycobacterial classical treatment for the past 8 months. At a routine follow-up with her pulmonologist the patient reported chest pain and moderate haemoptysis 1 month ago. A thoracic computed tomography (CT) scan showed a 6 cm saccular pseudoaneurysm in the descending thoracic aorta located 32 cm above the aortic hiatus (Fig. 1). Her physical examination was normal but her biology report showed a minor inflammatory syndrome.

The aorta was normal proximally and distally to the pseudoaneurysm and there was no contiguous pulmonary lesion that could have been associated with the haemoptysis, no active vertebral tuberculosis was found on the exam.

The patient underwent endovascular repair of the pseudoaneurysm using an endoprothesis (Cook Zenith alpha 26 mm × 150 mm) performed by the head of vascular department in Rabat Professsor B. Lekehal. Under general anesthesia the device was passed through the femoral artery after a minimal surgical access.

After a primary aortography was obtained using a 5-F Pigtail catheter, the landing zones were marked, then the introducer was inserted over an Amplatz heavy-duty wire and the endoprothesis was tracked and centered over the pseudoaneurysm (Fig. 2), under

* Corresponding author at: lot Basma, N° 36, Ouled oujih, 14080, Kenitra, Morocco.
E-mail address: dbouns.ayoub@gmail.com (A. Bounssir).

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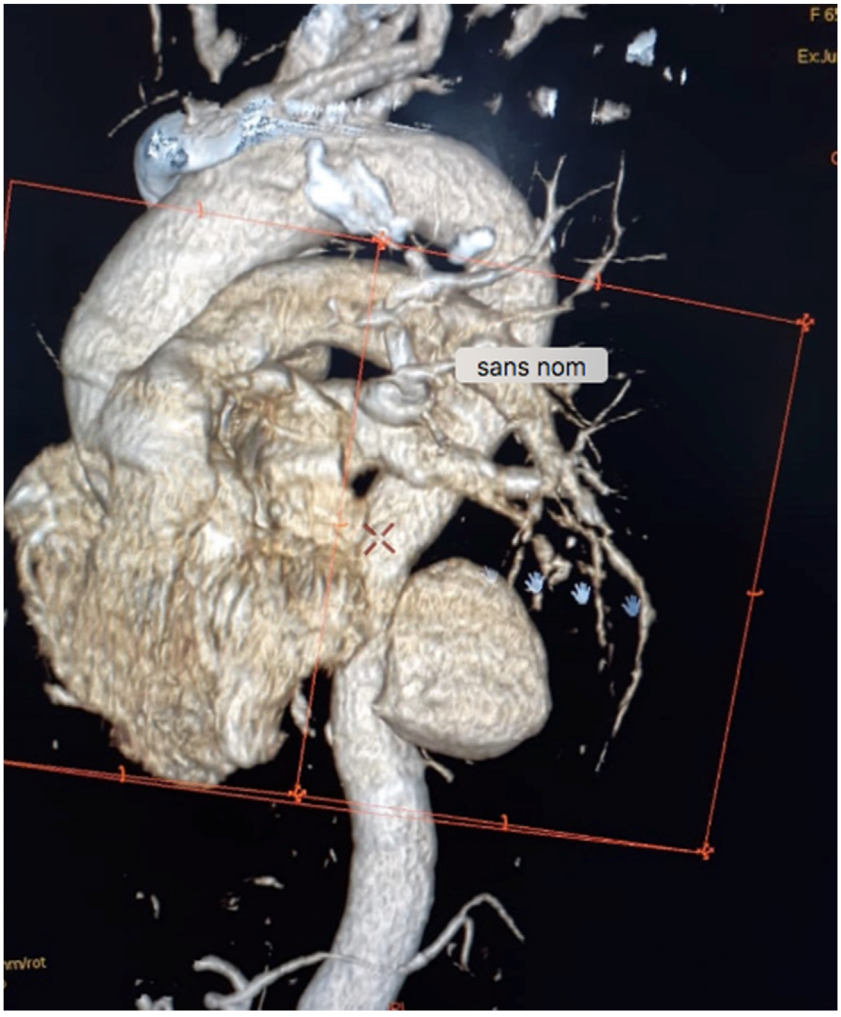

Fig. 1. 3D reconstruction demonstrating the descending aortic pseudoaneurysm.

Fig. 2. Angiography showing the aortic pseudo aneurysm and the positioning of the stent graft.

Fig. 3. Angiography showing the deploiement and the total exclusion of the pseudo aneurysm.

fluoroscopic guidance, deployed and subsequently ballooned. The final angiogram showed a complete and successful exclusion of the thoracic pseudoaneurysm (Fig. 3). The porcedure was well tolerated by the patient, with an uncomplicated courses and was discharged on postoperative day 5, the patient had to complete her 3 months antiagregant treatment and anti-tuberculosis medication.

At her 3-month follow-up, the patient was asymptomatic and the computed tomography confirmed a total exclusion of the pseudoaneurysm with no signs of endoleaks (Fig. 4).

The long term follow up consisted on an annual computed tomography.

3. Disscusion

Tuberculous pseudoaneurysms of the aorta are rare and have a poor prognosis. Only 44 cases have been reported since 1945 [1]. According to the work of Ikezawa et coll [2], only 32 patients with tuberculous aortic pseudoaneurysm have been successfully operated on and 12 of these 32 pseudoaneurysms were located on the thoracic aorta descending [3]. Contamination of the aorta by mycobacteria results from either: Direct implantation on the internal surface of the artery; or Implantation to the adventitia or media by the vasa vasorum; or Implantation by the lymphatics of the vasa vasorum; and Direct extension from the outside of the artery such as lymph nodes, pulmonary cavities, retroperitoneal or vertebral with cold abscess (Pott's disease). The last one, eroding into the aortic wall from an adjacent area of infection, accounted for 75% of all TB aortic aneurysms. Direct erosion to an adjacent organ such as the esophagus, bronchus, and duodenum can cause a fistula between the aorta and other organs [4].

Aortic pseudoaneurysms can be discovered accidentally during a clinical examination in the presence of an expansive throbbing mass on abdominal palpation, or during imaging (x-ray, ultrasound, CT scan, etc.) [5]. Most frequently, the diagnosis is made in the presence of symptomatic aneurysms causing abdominal or thoracic pain syndrome (64% of cases), hypovolemic shock (38% of cases) [6]. Mycotic aneurysms are generally sacciform which makes them very dangerous regardless of its size, even successive checks show a rapid progression of the aneurysm [7]. The treatment can be medico-endovascular or medico-surgical and allows to obtain a survival rate of approximately 87% [6]. The first reported case of tuberculous aortitis dates from 1882 by Weigert; the first case of tuberculous aneurysm was described in 1895 by Kamen. In 1952, Herndon et al. carried out the first surgical cure trials for tuberculous aneurysms [4].

The goal of the treatment of TB aneurysms is to avoid rupture of the aorta and to eliminate TB infection. Conventional treatment employs both anti-TB chemotherapy and surgical intervention. Open surgery had been the gold standard therapy as infected sources including aortic wall, and abscess, are able to be completely debrided; however, Endovascular treatment of tuberculous aortic aneurysms is possible, Liu et al. having reported two successes with the placement of covered stents [8] and recently thoracic endovascular aortic repair (TEVAR) has been reported as a possible alternative to open surgery.

TEVAR is less invasive compared to open surgery. The patients infected with TB may be poorly nourished, immunosuppressed, and suffer from respiratory impairment. For those patients at high risk for open surgery, TEVAR may be a better choice to prevent the rupture of aneurysms while optimizing the patient for open surgical repair. The advantage of TEVAR is the avoidance of a large incision, cardiopulmonary bypass, aortic cross clamping, negative effects on respiratory function, and transfusions. TEVAR can decrease short-term risk, as in-house/30-day mortality [9]. A lot of cases at literature review in which open surgery was initially attempted; however, it was switched to EVAR because severe adhesions made it too treacherous to dissect around the aorta [9]. The disadvantages of TEVAR are that debridement of the infected tissue cannot be done and tissue culture cannot be obtained for diagnosis. There are anatomical restrictions in TEVAR treatment as appropriate landing zones and vascular access are required. Adjunctive procedures, such as CT-guided drainage of abscess, are useful for diagnostic and therapeutic purposes.

The availability of stent grafts remains an important issue because we do not have a sufficient stock of prostheses, and we often have to postpone the endovascular treatment which

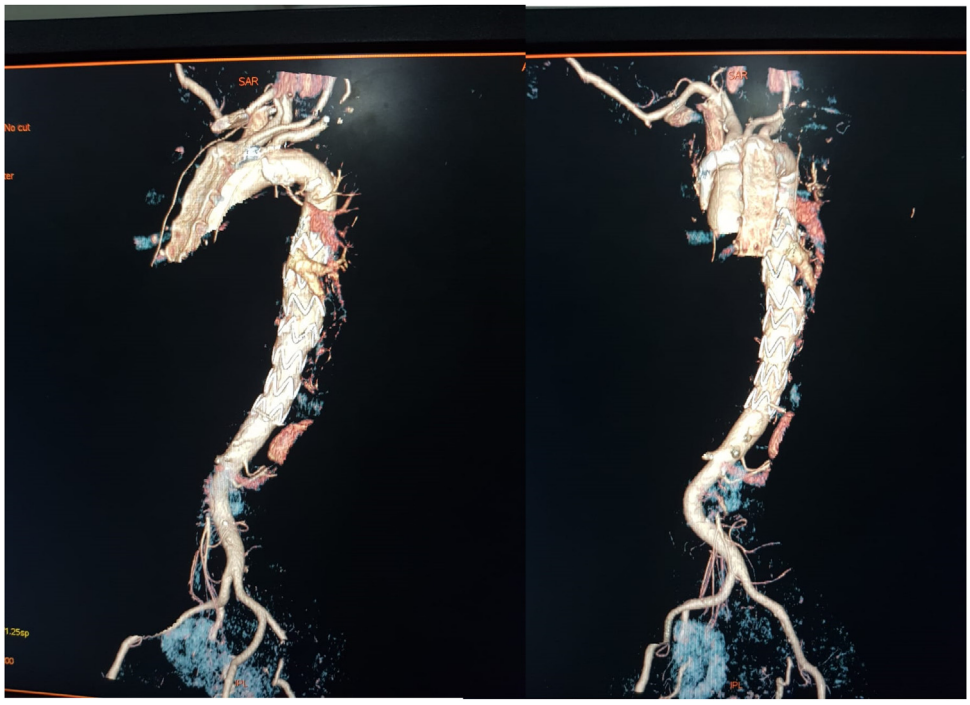

Fig. 4. CT scan showing the total exclusion of the aneurysm and the absence of endoleaks.

is difficult in emergency. Once the diagnosis of an aortic tuberculous false aneurysm is posed, an antituberculosis treatment is systematically undertaken according to the traditional protocol (isoniazid, rifampin, pyrazinamide, and ethambutol) (www.sante.gov.ma, National Program of Combat against Tuberculosis). The optimal duration of the treatment is not defined, and by analogy with other localizations of tuberculosis, it is at least 6 months with a routine surveillance of the antituberculosis drug tolerance, their effectiveness, and the appearance of possible resistances [10].

In literature review, almost all of the patients received anti-TB medication, with a median of 9 months (range: 4–18 months).

This case report illustrates the interest of the endovascular techniques which enabled us to overcome the urgency and to deal with this nonagenarian patient who presented a ruptured tuberculous false aneurysm of the thoracic aorta. However, the data are still insufficient to judge the long-term reliability of these techniques.

4. Conclusion

TEVAR with anti-TB medication showed favorable results, and improved the outcomes of this fatal pathology.

The optimal duration of anti-TB medications for TB pseudoaneurysm is uncertain and depends on the response to the treatment, side effects of the medications, and the patient's compliance.

Aggressive surveillance with follow-up imaging is critical to evaluate the need for further interventions.

The work has been reported in line with the SCARE 2018 criteria [11].

Declaration of Competing Interest

The authors report no declarations of interest.

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None.

Ethical approval

Exempt from ethnical approval in my institution.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

BOUNSSIR Ayoub: Conception, Methodology, Software, Data curation, Writing- Original draft preparation.

Jedar Asmae: Writing, Data collection.

Bouhdadi Hanae: Critical revision, Approval of the manuscript.

BAKKALI Tarik: Data curation, Analysis.

LEKEHAL Brahim: Critical revision, Approval of the manuscript.

Registration of research studies

N/A.

Guarantor

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