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EVAR for Thoracic Descending Aorta Pseudo Aneurysm Secondary to Salmonella Disease: Surgical Case Report

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Abstract **Case Report**

Background: Thoracic aortic pseudoaneurysms due to Salmonella infection are rare but life-threatening complications. Early diagnosis and effective treatment are essential to improve patient outcomes. ***Case presentation***: We report an 82-year-old man with a history of multiple comorbidities who presented with symptoms of systemic infection, including fever and weight loss. The diagnosis was confirmed by urine and blood cultures and imaging studies, which revealed an abdominal aortic pseudoaneurysm secondary to Salmonella enterica serotype enteritidis. ***Intervention***: The patient underwent endovascular aortic repair with a stent graft. Despite the complexity of the case due to the patient's critical condition, the procedure was successfully performed with a nearly complete exclusion of the pseudoaneurysm. Post-operative management included a prolonged course of antibiotics and monitoring for potential complications. ***Outcomes***: The patient experienced a gradual improvement in his overall condition, with follow-up imaging showing progressive occlusion of the pseudoaneurysm. After three months he was asymptomatic and subsequent CT scans confirmed stable stent position and satisfactory aortic flow. ***Conclusion***: This case highlights the importance of timely intervention for Salmonella-related pseudoaneurysms, especially in high-risk patients. Endovascular repair is a viable alternative to traditional surgical methods and offers a less invasive option for patients with significant comorbidities.

Keywords: Case report, salmonella, systemic infection, endopothesis, pseudoaneurysm, thoracic aorta.

1. INTRODUCTION

Thoracic aorta pseudoaneurysms represent a serious and often underrecognized complication of vascular pathology. Among the various etiologies, infections have emerged as a significant contributor, with Salmonella species being particularly noteworthy.

While Salmonella is commonly associated with gastrointestinal or urinary infections, its ability to invade vascular structures can lead to devastating consequences.

The incidence of rupture is higher than that of the arteriosclerotic aneurysm with a high rate of mortality. Early diagnosis and adequate treatment (active surgical treatment and antibiotic treatment with adequate dosage and duration) are significant for the improvement of survival. In Western countries, approximately 0.5–1.3% of the aneurysms are of bacterial origin, while in Asia, especially East Asia, the proportion of a bacterial aneurysm is significantly higher. Previous studies reported that about 13.3% of the aneurysms have bacterial origin [3, 4], among which Salmonella infection is common, second only to Staphylococcus aureus [5].

A case of 82 -year-old man with an infectious pseudoaneurysm of the abdominal aorta associated with infectious salmonella non typhi is presented. The patient was diagnosed by urine culture, blood culture, TAP injected CT-scan, and aortography.

Our goal in our case was to manage the exclusion of the aneurysm and avoid the infection of the endograft, even if the patient was in critical overall condition. The patient was eventually treated by endovascular aortic graft and his condition has been good.

2. CASE DESCRIPTION

We report the case of an 82-year-old man with a medical history of high blood pressure, ACFA with

pacemaker, hypertensive hypertrophic cardiopathy, mitral insufficiency, osteoporosis with vertebral compression, was admitted with impaired general condition: asthenia, weight loss, fever and extreme tiredness.

2.1 Clinical exam: weakness palor and dizziness, epigastric pain, back pain

2.2 Biological:

Blood:

- Hb: 9,3
- VS: 75
- CRP 250
- **Blood culture**: Positive for salmonella enterica serotype enteritidis

2.3 Transthoracic Echocardiography:

LV dysfunction: dilated left ventricle kinetic disorders, LVEF (SBP): 35% intra auricular right thrombus.

2.4 Computed tomographic scanning (CT) of the abdomen (Fig 1)

Extravasation of contrast by an aortic fissure at D11, feeding a thoraco abdominal pseudoaneurysm, extended pre and left latero-vertebral from D10, measuring 65.5x 45 mm in an axial plane and 42 mm in height multiple spinal osteoporotic fractures.

Fig 1: CT scan of pseudoaneurysm from D10 D11

The patient underwent endovascular repair of the pseudo-aneurysm using an endoprothesis (Medtronic 26 mm × 150 mm), put just before the birth of the superior mesenteric artery, after an embolization of the coeliac trunk, performed by the head of vascular department in Rabat Professor T.H. CHTATA. Under general anesthesia surgical approach then axillary artery puncture. coiled coelic trunk embolization.

Percutaneous puncture of the femoral artery on the scarpa, setting up an intro 6f, and changing it with a long introducer 12F over an Advantage™ terumo guidewire.

After a first aortography was obtained using a 5F Pigtail catheter, the landing zones were marked, the endoprothesis was tracked and centered over the pseudoaneurysm, under fluoroscopic guidance, deployed and subsequently ballooned with a reliant balloon catheter. The final angiogram showed a complete and successful exclusion of the pseudoaneurysm. the procedure ended without any complication, but was a bit longer than scheduled, the patient spent several nights in intensive care before being transferred to infectious department, during all these days the patient never had any abdominal pain that could be due to the occlusion of the coeliac trunk.

The patient had to finish his 3 months of double antiagregant treatment and several mouths of anti-biotic medication C3G injections + ciproflocacin oral.

An injected CT scan was performed 1 week after our surgery (Fig 2): coeliac trunk occluded, endoleak on the distal part of the stent graft that could be a type I.

Fig 2: Endoleak on the distal part of the stent graft that could be a type I

The decision of the unit was to perform an extension of the stent graft to treat the distal endoleak, but we couldn't t due to the patient overall condition. We opted for close CT scan surveillance after 3 weeks, the patient was in a better overall condition, took some Lbs, infection parameters went down, Second CT scan surveillance: endoleak type I getting smaller (Fig 3).

After 6 weeks of surgery and under antibiotics, another CT scan was perfomed showing small endoleak, the pseudoaneurism was getting occluded progressively (Fig 4).

After 3 months, the patient was asymptomatic and the computed tomography confirmed a sub total exclusion of the pseudoaneurysm, a smooth blood flow in the aorta, a firmly fixed stent on the aortic wall without distortion and displacement (Fig 5).

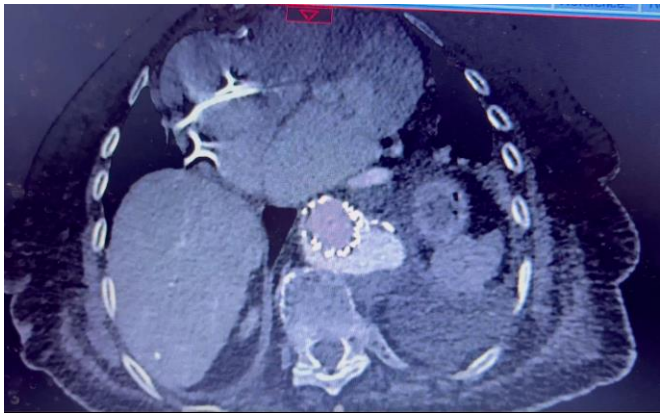

Fig 3: CT scan at 1 month endoleak type I getting smaller

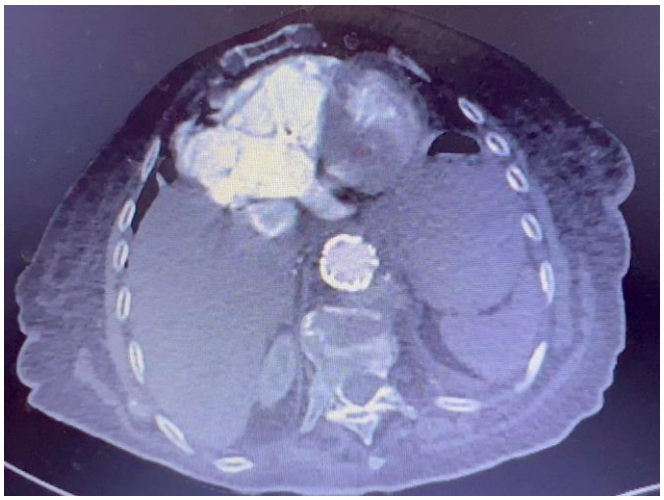

Fig 4: CT scan 6 weeks, very small endoleak type I

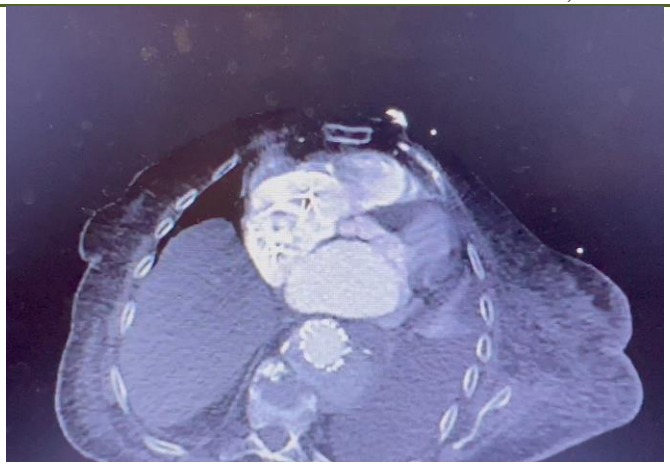

Fig 5: CT scan 3 months

The long term follow up consisted on an annual computed tomography. After 6 month the patient was asymptomatic, under antiaggregation + antibiotics. Her overall condition was quit good with no pain. Our work has been reported in line with the SCARE criteria.

3. DISCUSSION

Salmonella-related mycotic aneurysms of the aorta are very rare, with the majority of cases involving the abdominal aorta [1, 2], only Between 20% and 1/3 cases of infectious aortic aneurysms are located in the thoracic aorta have been reported in the literature [6, 7].

The occurrence of an infectious pseudoaneurysm of the thoracic aorta is now linked in most cases to a blood-borne infection of the previously injured intima. This is the main mechanism of infection, with most patients presenting bacteremia or fungemia in the context of known atheromatosis or cardiovascular risk factors [8].

Until the end of the 20th century, surgical treatment was the only interventional treatment available. The infectious aneurysm must be extensively resected, with removal of all adjacent purulent tissue, prior to revascularisation [7].

Endovascular management, developed more recently, appears to be a good alternative to surgery, particularly in frail patients who are ineligible for major surgery. In a review of the literature by Kan *et al.*, reporting 32 cases of infectious thoracic aortic aneurysms treated by endoprosthesis, early mortality at 30 days was 12.5%, due to rupture of the aneurysm or uncontrolled sepsis [9].

However, the mortality remains very high, with one study reporting 77% (10/13) within a month after diagnosis [2]. In addition to surgical or endovascular intervention, a prolonged antibiotic course is warranted for treatment.

In our case the patient overall condition was quite good after 6 months from surgery, even on a septic site.

4. CONCLUSION

In our case, due to his impaired heart condition the patient was treated by a stent graft, an antibiotic treatment was systematically undertaken according to blood culture for several months, the patient stayed several days in high intensive care, due to age and overall condition, the peripheral leakage on the CT scan 3 months after the procedure was acceptable and we did not proceed to any other stent graft.

Salmonella pseudoaneurysms of the aorta require early intervention before rupture. Surgical treatment remains the preferred option, but endovascular repair with a stent graft is a therapeutic alternative that should be considered in high-risk surgical patients in advanced ages.

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