

CASE REPORT

Post-surgical ascending aortic pseudoaneurysm repair

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False aneurysms or pseudoaneurysms of the ascending aorta are usually seen in patients with a history of cardiac surgery and are associated with anastomosis or cannulation of the vessel, leading to a poor healing process and defects in the layers of the wall with significant complications such as break. We presented herein a case with a postoperative pseudoaneurysm successfully operated on by means of using cardiopulmonary bypass, aortic-cross clamping and systemic hypothermia one month and a half after initial aortic valve procedure.

Key words: Ascending Aorta; Aortic valve surgery; Cardiac surgery, complications; Pseudoaneurysm;

Los falsos aneurismas o pseudoaneurismas de aorta ascendente generalmente se forman en pacientes con antecedentes de cirugía cardíaca y se asocian con anastomosis o canulación del vaso, lo que conduce a un proceso de curación deficiente y defectos en las capas de la pared con complicaciones importantes como la rotura. Presentamos aquí un caso con pseudoaneurisma postoperatorio de la aorta ascendente operado exitosamente mediante el uso de derivación cardiopulmonar, pinzamiento aórtico, e hipotermia sistémica un mes y medio después de un procedimiento valvular aórtico.

Palabras clave: Aorta ascendente; Cirugía valvular aórtica; Cirugía cardíaca, complicaciones; Pseudoaneurisma.

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The pseudoaneurysm of the ascending aorta is the contained rupture of the aortic wall that occurs after the disruption of one of the layers of the vessel wall, which is contained by the rest of the layers of this and by the adjacent structures with or without development of the neo intima [1]. They are usually formed in patients with a history of cardiac surgery and are associated with anastomosis or cannulation of the vessels, leading to a poor healing process and defects in the wall of the vessel itself, additionally other traumatic, infectious and inflammatory events may be associated in the formation of a pseudoaneurysm [2]. Ascending aortic surgery, with the use of prosthetic tubes, with the Bentall and Bono technique since the 1970s, has been an alternative for patients with disorders such as annuloectasia and type A aortic dissection, associated or not to Marfan's disease. However, it is still a surgery with high mortality risks, mainly related to late complications, both inherent to the technique and complications secondary to infections or causes of connective tissue diseases of the aorta [3].

CLINICAL CASE

This is a 47-year-old patient, who started his clinical picture 8 days prior to his hospital admission, with a high intensity precordial pain and stabbing origin, radiating towards the right anterior part of the thorax, ipsilateral thoracic, and region scapular. As a relevant personal history, the patient underwent aortic valve replacement one month and a half before due to severe aortic stenosis (type II bicuspid aortic valve), which resulted in a mixed aortic valve disease. A St. Jude Masters HP 23 mm mechanical prosthesis was placed.

A contrast-enhanced computed tomography (CT) scan was performed. A pseudoaneurysm of 6.1 x 4.4 x 5.7 cm in diameter located and protruding from the anterior aspect of the ascending aorta, with the presence of thrombi in its interior. This abnormal structure was originated from a defect in the anterior wall of the ascending aorta, from the aortic root towards the sternal manubrium, which partially compressed the path of the innominate vein at its posterior border and towards its anterior border they were in contact with the posterior border of the sternal manubrium, where it was observed soft tissue thickening and separation of the sternotomy edges (Fig. 1).

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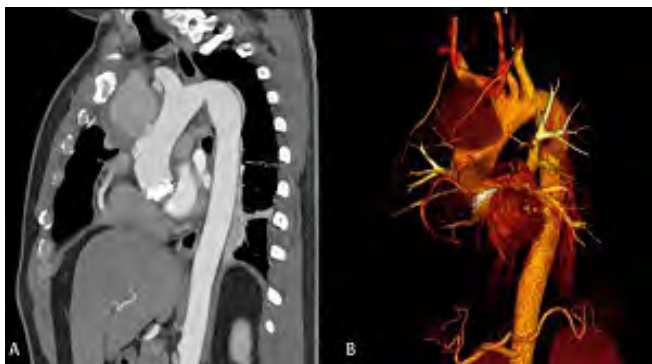


Figure 1. A) CT scan showing the pseudoaneurysm in ascending aorta. B) tomographic reconstruction.

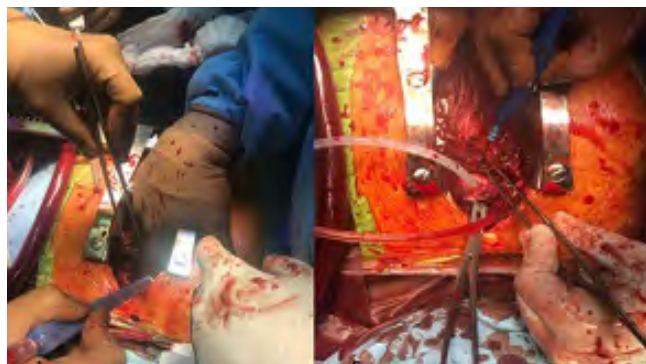


Figure 2. A) Digital control to sternal opening. B) Catheter for vascular control

Urgent repair of the pseudoaneurysm was indicated. A transesophageal echocardiogram was performed, which reported a bi-leaflet mechanical valve in normal aortic position, mild mitral regurgitation, without the presence of any leak in the ascending aortic. Before starting the re-sternotomy, cardiopulmonary bypass was established by means of cannulation of the right subclavian artery and left femoral venous cannulation, and the patient was cooled up to a rectal temperature of 32 ° C. Then, the sternotomy was performed with an oscillating saw, when performing the course with bleeding for which digital control was performed and subsequently a non-Foley catheter was used. 16fr to inflate the balloon and get vascular control. After careful dissection, aortic cross-clamping and cardiac arrest were performed (Fig. 2). After debridement and dissection of the pseudoaneurysm, an internal thrombus was found and removed. The pseudoaneurysm wall was excised. A bovine pericardium patch of 5x5 cm was used to close the defect with 5/0 polipropilene stitches (Fig. 3). Rewarming was carried out and the cardiopulmonary bypass was discontinued. The patient remained hemodynamically stable and with minimal doses of inotropic support. Extubated within the next 6 hours and the inotropic was removed. She was kept under antibiotic management with teicoplanin and after being discharged from the ICU, she was kept under surveillance for 8 days. No more complications were observed. Biopsy cultures were reported without growth of microorganisms. The patient is currently being followed in the outpatient cardiology clinic completely asymptomatic.



Figure 3. A) Pseudoaneurysm wall removed. B) Bovine pericardial patch placed on the ascending aorta defect.

COMMENT

The incidence of ascending aortic pseudoaneurysm has been reported as low as 0.5%, according to various studies. However, high incidence rates of up to 13% were reported in a series of surveillance images of patients after cardiac or aortic surgery. In more than 60% of cases, the pseudoaneurysm appeared at the level of the suture line after surgery, procedures carried out at the level of the aortic root such as Bentall and de Bono, were the most commonly associated procedures, accounting for 55 % of cases [2].

Pseudoaneurysms of the ascending aorta are associated with a high rate of morbidity and mortality, in some patients the progressive growth of the pseudoaneurysm can erode the bony structures of the sternum, the rupture is an imminent sequel of a large pseudoaneurysm of the ascending aorta, because the sternal erosion and the anterior location of the aneurysm in these patients, make the risk of rupture very high. In addition to the signs and symptoms of heart failure, it is for all these reasons that urgent surgical correction is required [4].

A greater surgical challenge is choosing an approach that allows a safe introduction into the chest when a pseudoaneurysm has eroded bone structures. The use of appropriate techniques will avoid catastrophic bleeding during sternotomy. The main objectives are the control of the aortic defect during mediastinal dissection and preserve adequate cerebral perfusion. Other authors have described their methods to institute extracorporeal circulation before sternotomy. In these instances, the best approach for extracorporeal circulation remains undefined and depends on the site and size of the ascending aortic pseudoaneurysm. It has been suggested the cannulation of the femoral artery or axillary for extracorporeal circulation. Circulatory arrest with profound hypothermia allows the preservation of brain function, as well as provides the operative field free of blood and also allows time to perform mediastinal dissection and control of the aortic defect. A sudden and extreme loss of blood can be avoided using this technique [4]. In some other cases, moderate hypothermia with extracorporeal circulation with femoral cannulation is preferred, under moderate hypothermia with transient circulatory arrest [5].

Surgeon's decision to institute extracorporeal circulation with axillary, femoral, or carotid should depend on the nature of each case. The proper use of hypothermic circulatory arrest allows mediastinal dissection and aortic control [4].

As of the year 2000, the cases of ascending aortic pathologies treated with endovascular technique progressively increased to the seven cases reported by Preventza et al. in 2014 and even at 21 by Roselli et al. in 2015 and 15 by Li in 2016. In most of the experiences reported in a recent review by Muetteties et al., The indications for treatment were type A dissection and pseudoaneurysms, and the preferred vascular access was through the femoral artery [6].

Originally ascending aortic stent grafting has been used up to this point primarily as a last-ditch effort to treat patients who are deemed unsuitable candidates for open surgery [7].

Open repair is currently the standard of care. Continuously expanding endovascular management including coil embolization, stenting, and implantation of occlusive devices. However, not all lesions are suitable for endovascular management [8].

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