

Vascular Prosthesis Infection in Thoracic Aorta Surgery. Review of the Experience and a Case Report Illustrating treatment with an Unconventional Technique

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We report the case of a 37-year-old-female patient who had undergone a Bentall procedure at our service and returned with intense chest pain and acute aortic dissection type III, which was diagnosed and clinically treated. One year after this episode, this dissection expanded, and the patient underwent surgery with interposition of a Dacron graft in the descending aorta. In the immediate postoperative period, the patient experienced left bronchopneumonia and was discharged afebrile and in good condition. One month after discharge, she returned with fever and toxemia. Pleural empyema was diagnosed, and she underwent an exploratory thoracotomy that did not confirm this diagnosis, but revealed intense effusion thickening. Four months after the exploratory thoracotomy, Klebsiella pneumoniae and Enterobacter sp were isolated in a blood culture. Magnetic resonance imaging revealed shapes compatible with perigraft infection. With this clinical and laboratory picture, graft removal was indicated as was axillo-bifemoral grafting. Surgery was successfully performed, the patient was discharged in good condition, and remains well after a 57-month follow-up without complications. The methods used for diagnosis and treatment of prosthesis infection in thoracic aorta surgery are discussed.

In recent years, significant progress has been achieved in the treatment of aneurysms and aortic dissections^{1,2}. The advances are related to surgical techniques, vascular prostheses in the postoperative period, antibiotic therapy, as well as methods of diagnostic investigation using computed tomography and magnetic resonance³.

Despite these advances, severe⁴ postoperative com-

plications sometimes still occur with surgical procedures in the aorta. Among them, graft infection is one of the most severe, resulting in great morbidity and mortality³.

Some methods may be used to treat this complication with favorable results^{3,5}. The authors report their service's experience with vascular prosthesis infection and point out the case of a patient who evolved with prosthesis infection in the postoperative period of distal dissection surgery, with treatment performed with an alternative surgical technique.

Case Report

A 37-year-old, white female patient with Marfan's syndrome underwent surgery in 1985 to treat annuloaortic ectasia with the Bentall procedure. The patient was discharged in good condition and was being followed-up when she returned in 1990 complaining of intense thoracic pain. A De Bakey type III aortic dissection was diagnosed.

Since no complications were present, clinical treatment was maintained until May 1991, when she returned with pain and underwent a chest X-ray, digital angiography, and CT scan demonstrating an 80-mm dilation of the descending thoracic aorta.

The patient was referred for a surgical procedure and underwent correction of the dissection through interposition of a Dacron graft, replacing the descending aorta (fig. 1A and B). The surgery was performed using simple aortic clamping between the left carotid and the left subclavian artery. Poor tissue was verified in the proximal stump, and because the distal stump was near the diaphragm, access was hindered. During this period, cerebrospinal pressure was monitored and maintained below 10 mmHg through drainage of 50 mL of liquid.

The patient evolved with bronchopneumonia, received cefoxitin for 15 days, and was discharged in excellent clinical condition.

She was evolving well when she returned to the hospi-

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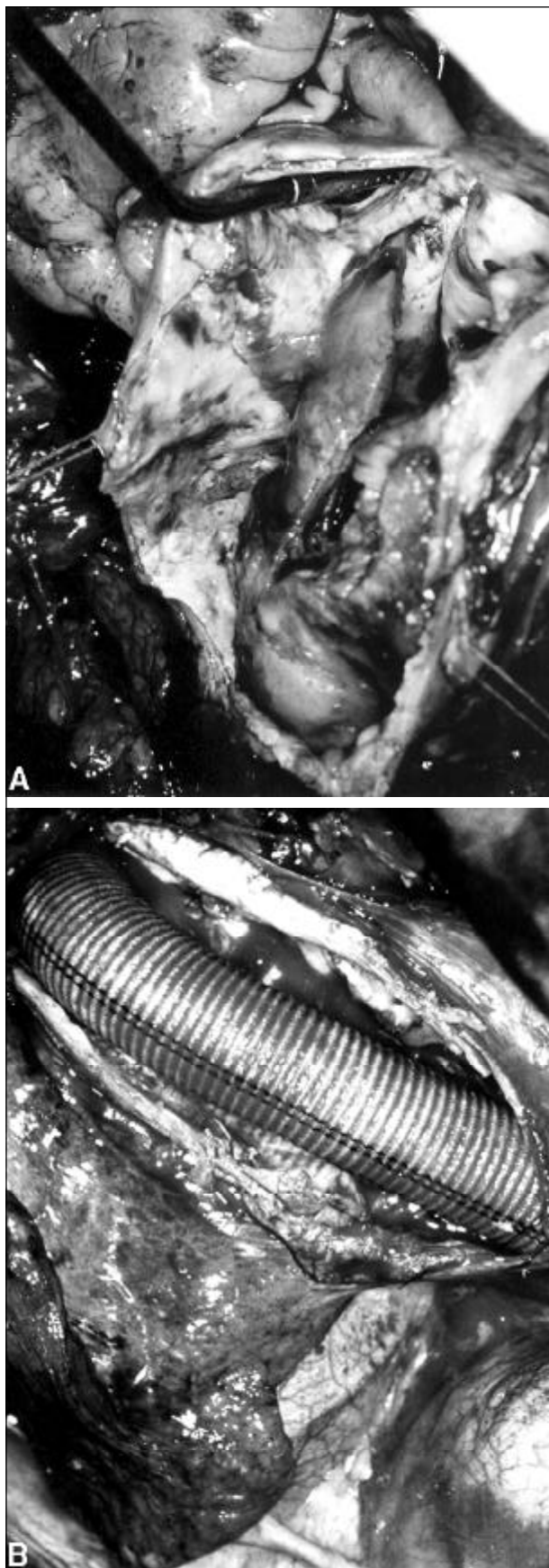


Fig. 1 - A) Aspect of the dissected aorta, the great amount of thrombi in the false lumen; B) final aspect of the operation to correct descending aorta dissection, demonstrating extensive Dacron graft.

tal after 1 month with fever suggesting empyema effusion. She underwent exploratory thoracotomy that did not confirm the diagnosis but demonstrated only intense pleural thickening. During this procedure, puncture of the perigraft region was performed without loss of fluid.

She remained in the hospital to recover from the thoracotomy and experienced fever and bacteremia crises. Three months later, *Klebsiella pneumoniae* and *Enterobacter sp* were isolated in a serial blood culture, and treatment with antibiotics was initiated; however, the clinical picture did not improve. Investigation continued with the use of CT scanning that revealed a large number of thrombi in the perigraft region and the presence of a small amount of air (fig. 2). This picture led to the diagnosis of prosthesis infection, and its removal was indicated so that an axillo-bifemoral graft could be performed due to the difficulties expected. The surgery was successfully performed in 1991 (fig. 3A and B). The Dacron graft was withdrawn, the proximal and distal aortic stumps were closed, and the axillo-bifemoral graft was performed. The patient remained in the hospital for 45 days with antibiotics, the fever ceased, and the patient progressively improved until she was discharged.

She is still being followed-up, and she has been asymptomatic for 7 years. A late angiographic study demonstrated that the graft was pervious and the thoracic

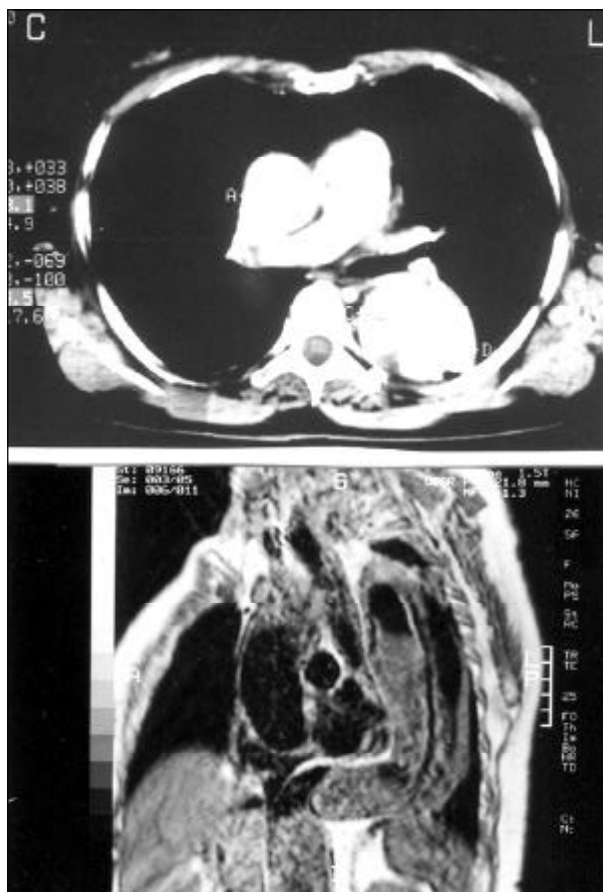


Fig. 2 - Magnetic resonance and CT scan demonstrating the presence of thrombi, suggesting the presence of air in the perigraft region.

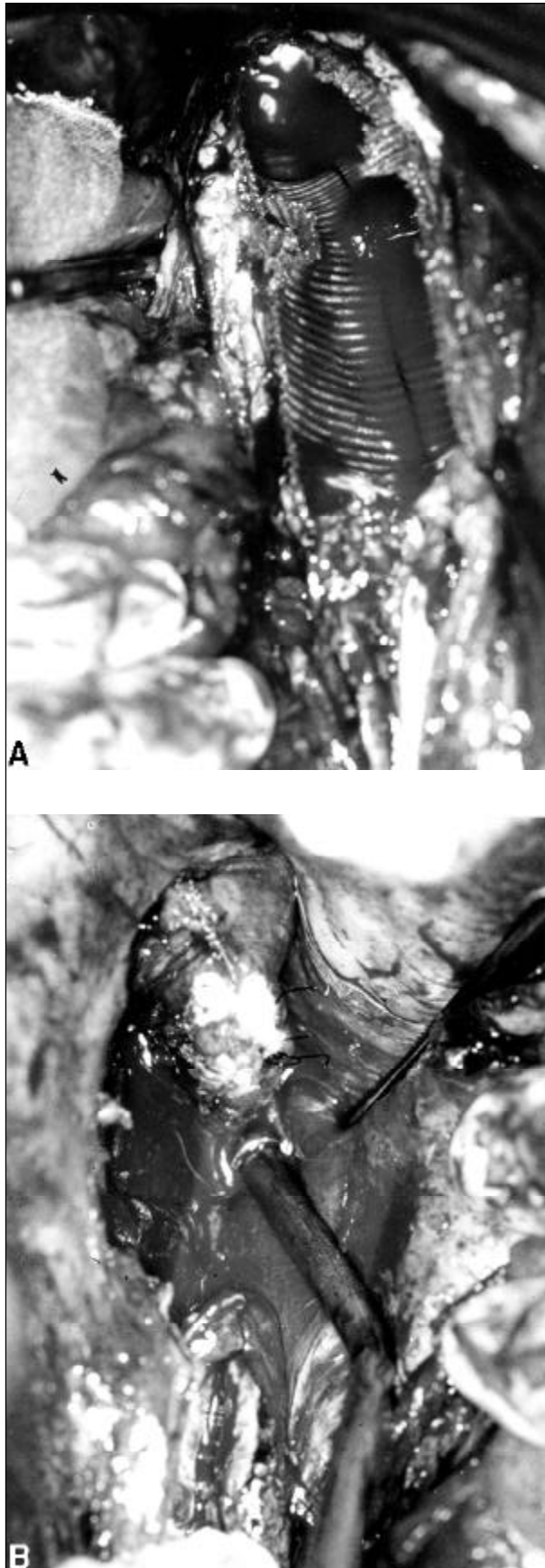


Fig. 3 - A) The graft is partially withdrawn. Detail of the reoperation to treat infection; B) the interruption of the descending aorta right after emergency of the left subclavian artery is noticed.

artery was excluded (fig. 4). She is currently taking oral anti-coagulant medication and beta-blockers.

Discussion

Postoperative infection of a graft in thoracic artery surgery is a rare complication. It has occurred in between 0.5 and 5% of the patients undergoing this type of surgery^{6,7}.

Large surgeries used to treat thoraco-abdominal or even abdominal aneurysms, requiring anastomoses with femoral and thoracic arteries, are usually more susceptible to infections, especially when infected cutaneous lesions are present in the abdominal region, together with the inadequate use of central venous catheters^{1,3}.

The infectious process may start in the suture site leading to dehiscence and false aneurysm formation. These false aneurysms may tear in cavities or adjacent organs, leading to hemoptysis, hematemesis, or melena according to their location⁸.



FFig. 4 - Digital angiography performed in the late postoperative period, demonstrating the axillo-bifemoral graft and the site of abdominal aorta interruption indicated by the arrow.

Infection of aortic prostheses is evident by the presence of fever and thoracic pain. The infectious process must therefore be carefully investigated. This investigation must entail complementary examinations that will indicate the appropriate conduct. The first important measure is to try to isolate the responsible germ by using serial blood cultures. The most frequently found germs are *Staficoco Aureus*, *S. Epidermidis*, *Streptococo*, *Enterobacter*, *E. Coli*, *Proteus*, and *Pseudomonas*. Clinical treatment includes specific antibiotics for a minimum 30-day period⁹.

Complementary examinations through images must be used, and the most indicated are CT scan, and magnetic resonance, where the presence of air and liquid in the perigraft region can be observed. Other methods may contribute to the diagnosis, such as radioisotope study, aortography in the cases where false aneurysm or aortic obstruction is suspected; digestive endoscopy when stomach, esophagus, or duodenum erosion is suspected³.

In almost all cases, the treatment for this complication is surgical, performed with graft replacement as well as graft withdrawal followed by extraanatomical derivation, and, occasionally, the prosthesis is covered with vascular grafts followed by extraanatomical derivation^{3,4,10}.

In our case, the clinical picture that suggested perigraft infection was hindered by the radiologic image, which suggested the presence of empyema in the hemi-thorax apex. The patient previously underwent exploratory thoracotomy.

Surgery was indicated after the germs had been isolated in the blood culture, in association with the clinical picture and the examination using images. However, the risk of a third thoracotomy; the clinical picture of malnutrition; difficulty reconstructing the vascular graft from the diseased descending aorta; the ascending aorta with graft, paraplegia, and also the intolerance to synthetic material¹¹; before the positive result of blood cultures made us wait too long before withdrawing the graft.

We believe that the increased time of clamping and bleeding during the first intervention were the factors that contributed to the development of infection and that other investigation methods, such as radiology with labelled leukocytes, could help early treatment¹².

We have concluded that the incidence of perigrafts in surgeries to correct thoracic aorta aneurysms is low and, in the present case, axillo-bifemoral was the adequate option with excellent late and immediate results.

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