

Aneurysmal Dilation of the Reimplant Segment of the Visceral Vessels After Thoracoabdominal Aneurysm Correction

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We present a case of aneurysmal dilation of the aortic residual segment, involving abdominal vessels in corrective surgeries for thoracoabdominal aortic aneurysm, through the identification of risk groups for recurrent dilation, aiming at using a specific operative technique with a branched graft, to prevent aneurysm relapse.

Advances in surgery for thoracoabdominal aneurysm correction occurred after the systematization proposed by Crawford et al in 1978¹. Once diagnosed, the patient must be carefully and invasively investigated to determine an objective approach, because the natural history of thoracoabdominal aortic aneurysm, without surgical intervention, is well known and causes increased morbidity and mortality, especially due to the comorbidities associated with the spread of vascular disease.

Griep et al² presented a follow-up of 156 patients with descending aortic aneurysms and thoracoabdominal abdominal aneurysm without surgery, and they pointed out that 22.4% evolved to rupture in 1 year. Of the 44 deaths in this cohort, 79.5% were due to aortic rupture, 9 in 10 dissections, and 26 in 34 degenerative aneurysm (P=0.004). Mean diameter, when rupture occurred also was significantly different between the groups; in dissections it was 5.4 cm, and in degenerative aneurysms it was 5.8 cm (P=0.05).

Pressler and McNamara³ described 72% mortality in a mean 3-year follow-up in asymptomatic patients with thoracic aortic aneurysm under clinical treatment. Forty per cent of the mortality was secondary to aortic rupture, and 32% was secondary to cardiovascular disease.

The severity and the incidence of thoracoabdominal aortic aneurysm are increasing, especially because of the ageing of the population, surpassing 5 cases per 100,000 people/year⁴. However, current surgical results are encouraging, providing a great therapeutic possibility to this group of patients. Coselli et al⁵ obtained a hospital mortality rate of 7.1%, and paraplegia of 4.6% in 1220 patients undergoing surgery.

According to the surgical technique used to correct thoracoabdominal aortic aneurysm, in case of a remaining diseased aortic segment, this region may dilate again and have complications, especially in young patients with connective tissue disease (Marfan's syndrome and Ehlers-Danlos syndrome).

Case Report

A 77-year-old-male patient underwent surgery to correct thoracoabdominal aortic aneurysm (Crawford extent III[®]) in 1991, and myocardial revascularization in 1996. During follow-up, we observed abdominal aortic dilation that involved the celiac trunk, the superior mesenteric artery, right and left renal arteries, anastomosed in Dacron graft 11 years ago to correct thoracoabdominal aortic aneurysm (fig. 1). This aortic segment had grown 0.4 cm/year in the previous 2 years, and at the time of surgical indication, it was 5.9 cm in the major transversal diameter. The patient reported scattered episodes of lumbar pain not related to effort. He also had mild left ventricular dysfunction with an ejection fraction of 50%, systemic blood hypertension, chronic obstructive pulmonary disease, hypercholesterolemia, peripheral vasculopathy, obstructive carotid disease (left carotid with 50% obstruction in the carotid bulb), atrophic left kidney, and borderline renal function (serum creatinine 1.6 mg/dL).

The patient underwent surgery for resection of the aneurysm through thoracotomy with interpositioning of the branched vascular graft (fig. 2) trough of the descending thoracic aorta clamping. Ischemia times of the right kidney, inferior limbs, superior mesenteric artery, and of the

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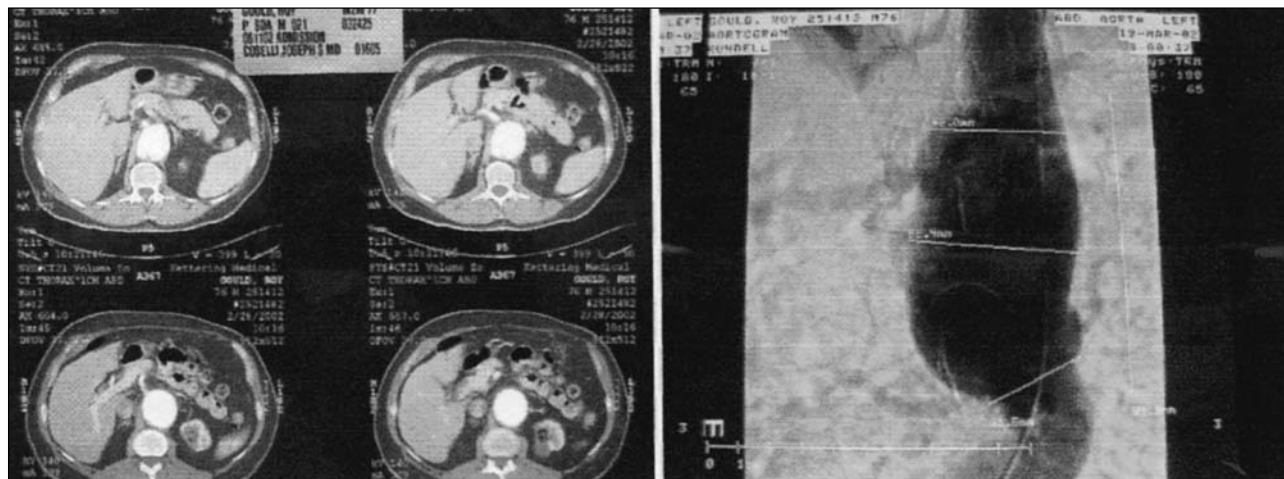


Fig. 1 – Scanned images demonstrating aneurysmal dilation of the residual segment of the aorta used for insertion of the abdominal vessels in Dacron graft. A) transversal plane; B) sagittal plane.

celiac trunk were 35 minutes, 41 minutes, and 59 minutes, respectively. Cerebrospinal fluid drainage and renal perfusion were performed with intermittent cold crystalloid solution, for spinal cord and renal protection, during the period of ischemia. The patient evolved with worsening of renal function (creatinine peak of 2.6 mg/dL on the 8th postoperative day) without the need for dialysis. He also had pulmonary hypersecretion requiring orotracheal reintubation during the 4th postoperative day (extubated again in the 8th postoperative day). Amylase and hepatic enzyme did not alter. The patient was discharged in the 26th postoperative day after an adequate control examination (fig. 3).

Discussion

The greater the experience of the surgical staff, the lower the operative risk of thoracoabdominal aortic aneurysms, despite being associated with important morbidities to its correction, especially, due to the associated organs (bone marrow, liver, pancreas, kidneys, and other abdominal viscera) by the access and surgical thoracotomy.

Predictor factors of elective operative mortality are the following: advanced age, renal failure, symptomatic aneurysms, and thoracoabdominal aneurysms with Crawford extent II⁶. Reoperation and chronic dissections do not interfere with mortality⁷.

The incidence of paraplegia has been reduced by maintaining distal aortic perfusion during surgery, cerebrospinal fluid drainage, moderated hypothermia, and reimplantation of intercostal vessels (T8-L1), especially in the longer aneurysms (Crawford type II)^{8,9}.

In this case, we used the most frequently applied technique for insertion of abdominal vessels through direct suture of the aortic segment (containing the celiac trunk and the superior mesenteric and renal arteries) in the Dacron graft. This kind of approach simplifies and reduces the procedure's duration, thereby reducing ischemic time, which is decisive in the evolvement of the patient. However, young patients with connective tissue disease or those whose residual aortic segment is extensive (due to the distance between vessels), are more prone to have dilation of this region of diseased aorta during their follow-up.

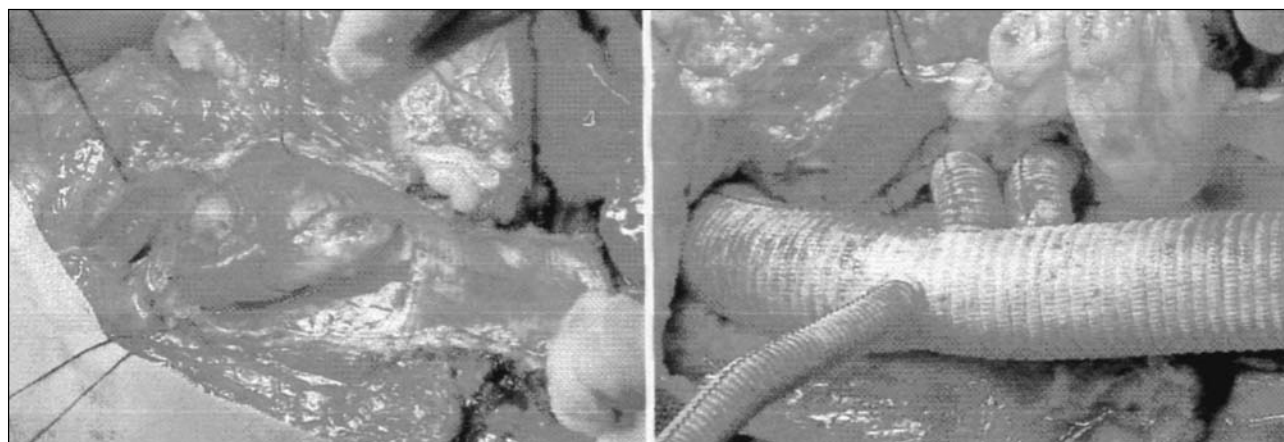


Fig. 2 – Intraoperative pictures A) open old Dacron graft- we can observe residual segment of the aorta with aneurysm dilation; B) ramified vascular graft used for reinsertion of abdominal vessels.

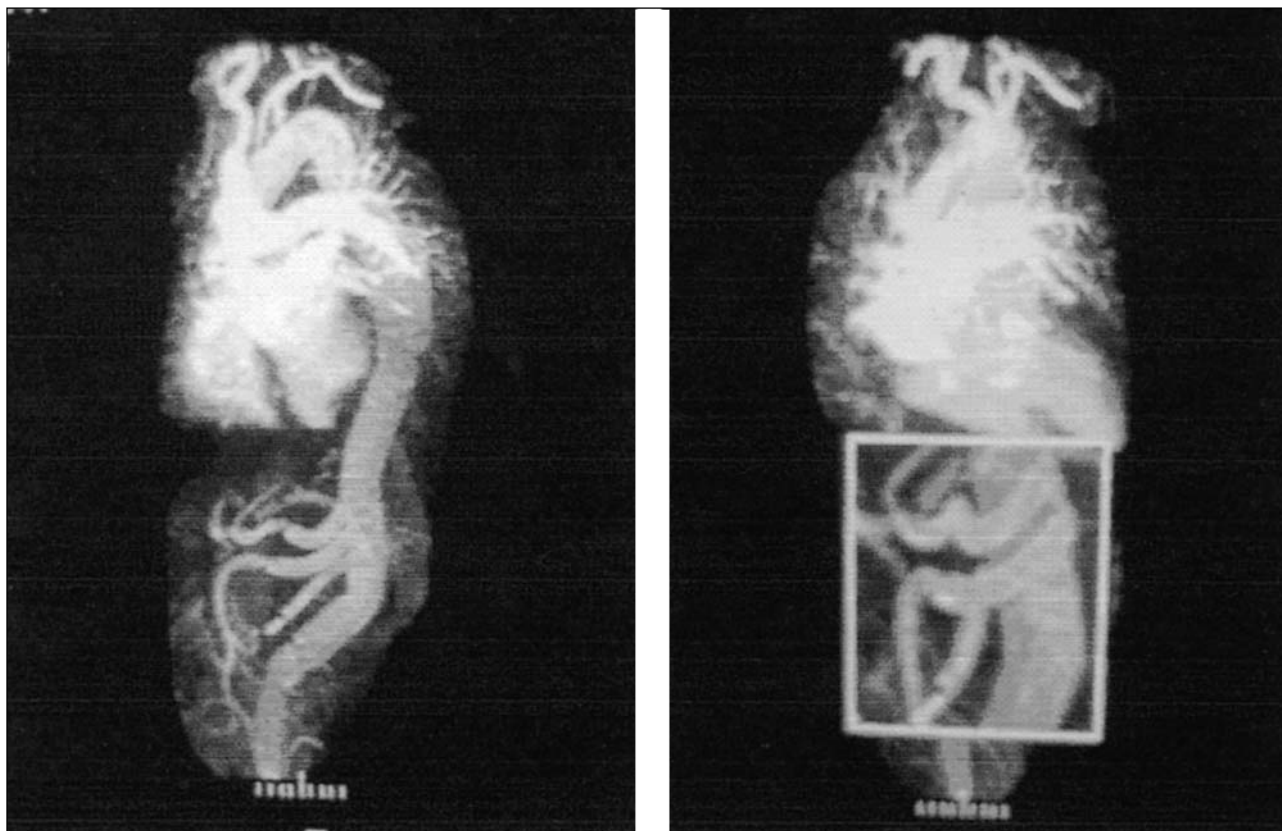


Fig. 3 – Total aortic magnetic resonance imaging performed on the 18th postoperative day. A) Panoramic view of the cardiovascular system with a view of the graft with its previous branches. B) Close-up of the anastomoses performed.

Dardick et al¹⁰ reported that of 107 patients operated on due to thoracoabdominal aneurysms, 8 patients (7.5%) evolved with aneurysmal expansion of this region. Three of them were women with connective tissue disorders and a mean age of 36 years, and 5 were men with degenerative aneurysm and a mean age of 73 years. Mean follow-up time was 6.5 years.

With the purpose of avoiding this complication, we

suggest that the risk population or those whose vessels are distant use branched vascular prostheses inserted during reoperation, because although making the procedure more complex and increasing ischemia time, they offer a more radical treatment with the possibility of complete resection of the involved aorta, avoiding the relapse of the aneurysm in the residual aorta.

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