

SHORT REPORT

Combined Treatment, Endovascular and Surgical Treatment of Postraumatic Pseudoaneurysm in the Aortic Arch

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Traumatic rupture of the thoracic aorta has a high mortality. The endovascular alternative has been considered for aortic repair in high-risk patients with multiple trauma. We report a case of a 20 year-old man who suffered a multiple trauma secondary to motor vehicle accident. Arteriography revealed the existence of a pseudoaneurysm at the origin of left common carotid artery.

A short and immediate control of the thoracic aorta is needed in cases with active bleeding of the aorta when the patient is unstable. Endovascular treatment as a definitive repair or first control before performing surgical repair seems a good choice.

Our experience in this patient suggests that the combined endovascular and surgical treatment can be a valuable therapeutic alternative when treating a blunt aortic lesion. It is less invasive surgery and avoids aortic cross-clamping, circulatory assistance and high dose heparinization.

Further studies are required to determine the relevance of the endovascular treatment in the management of traumatic rupture of the aorta in young patients.

Keywords: Aorta; Endovascular; Postraumatic; Pseudoaneurysm.

Introduction

Traumatic rupture of the thoracic aorta is a surgical emergency frequently secondary to rapid deceleration injuries such as motor vehicle accidents. Aortic lesions cause high mortality.^{1,2,8,13} Only about 15 to 20 percent of patients survive trauma and get to the hospital. In patients who do not die, a contained rupture of the aorta at the adventitious and mediastinic structures occurs.¹³ Treatment for these patients is controversial.

Open surgery is the standard treatment. Different procedures for repair of injuries to the thoracic aorta have been described.^{18,19} Surgical intervention requires a thoracotomy, systemic anticoagulation and aortic cross-clamping, which increase the morbidity and mortality of the intervention. In particular in cases of multiple injuries at other levels.^{1,3,8,13}

Several surgery-related complications such as paraplegia, bleeding, haemorrhage in visceral contusions, cardiac ischemia, respiratory failure, renal failure, sepsis or intestinal ischemia have been described.^{1,8}

Since the introduction of endovascular treatment for abdominal aortic aneurysms (AAA) and thoracic aortic aneurysms (TAA) by Parodi²¹ (1991) and Dake,²² respectively, the endovascular alternative has been considered for aortic repair in high-risk patients with multiple trauma.^{1–13}

Many studies in the literature focus on the lower morbidity and mortality rates of endovascular treatment in multiple-trauma patients with traumatic lesion of the thoracic aorta.^{1,2,8}

Case Report

A 20 year-old man was admitted in the intensive care unit for multiple trauma secondary to motor vehicle accident. He presented with pulmonary contusion,

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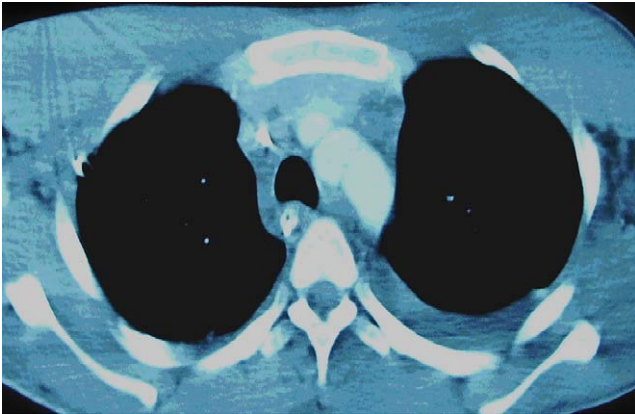


Fig. 1. Thoracic CT scan showing an irregular wall at level of aortic arch.

bone fractures in extremities at multiple levels and a tension pneumothorax which was resolved with a chest drain. His past medical history was unremarkable.

The patient was stabilized haemodynamically. A thoracic CT scan confirmed the existence of bilateral pulmonary contusion and a mass at left cervicothoracic level which was filled with contrast. An irregular wall at level of aortic arch was seen (Fig. 1). Following the finding of the thoracic CT scan, the patient underwent a transthoracic echocardiogram and arteriography. Pericardial effusion was not found on transthoracic echocardiogram. Ventricular and valvular functions were normal. Arteriography revealed the existence of a 3 cm × 4 cm pseudoaneurysm at the origin of left common carotid artery. An anatomic variation was also seen: the exit of left vertebral artery from the aortic arch (Fig. 2).

During the second day in hospital, the patient needed respiratory assistance because the development of an acute respiratory insufficiency. Various fractures at different levels have to be stabilized. We did not see any significant changes in blood pressure, trying to maintain a pressure of about 100 mmHg through the treatment with intravenous B-blocker and vasodilators.

No sign of impending rupture such as a widened mediastinum, haemothorax or transient hypotension were seen until the surgical procedure was decided, and the endovascular graft was obtained.

On the third day after admission into hospital we excluded the pseudoaneurysm with an endoprosthesis introduced from a left femoral artery.

Before the introduction of the endoprosthesis a carotid-subclavian bypass, from right common carotid to left subclavian artery, was performed with Dacron prosthesis of 8 mm, though subcutaneous tissue. The left common carotid was taken of it with the proximal anastomosis to left subclavian artery.

Subsequently endovascular exclusion of the pseudoaneurysm through the implantation of two Talent 24 mm × 130 mm endoprostheses was performed. On intraoperative arteriographic control he had a type I endoleak. Some hours later the patient underwent arteriographic control to analyze leak persistence.

Arteriography on postoperative day 2 revealed the persistence of filling in the aortic pseudoaneurysm, due to a leak between the endoprosthesis and the wall of the aortic arch. The endoprosthesis was implanted on the aortic arch and at the beginning it partially occluded the origin of brachiocephalic trunk. It was also observed that the carotid-subclavian bypass remained patent (Fig. 3).

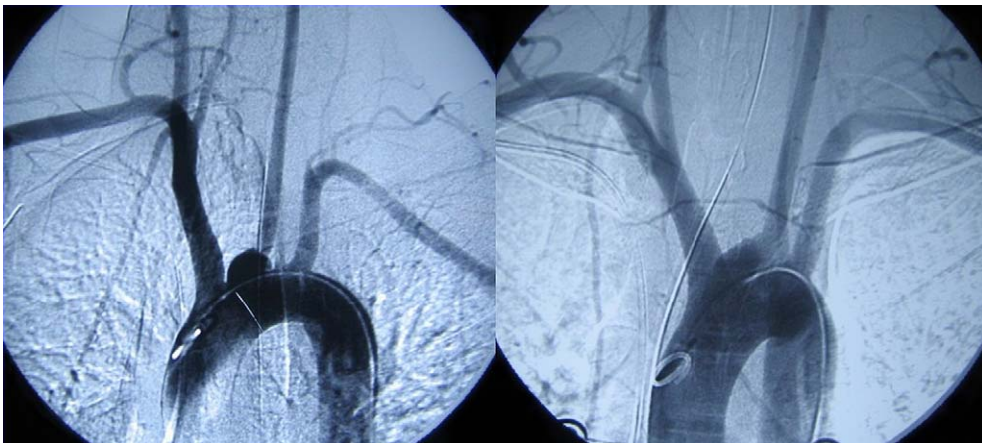


Fig. 2. Preoperative arteriography: existence of a pseudoaneurysm at the origin of the left common carotid.

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