

## Endovascular Treatment of Traumatic Thoracic Aortic Transection—Role of Timing: A Case Report

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### ABSTRACT

Clinical management of traumatic thoracic aortic transection gains importance because of controversial approaches regarding diagnosis, treatment choices, and the timing of treatment modalities. We report on an emergency endovascular stent graft placement for a patient with acute traumatic thoracic aortic transection and discuss the role of timing for this kind of procedure.

### INTRODUCTION

Untreated traumatic thoracic aortic transection (TTAT) carries a mortality rate of 90% [Tehrani 2006]. Conventional surgical repair of these injuries is performed with a high mortality rate that ranges from 5% to 28% [Tehrani 2006]. Endovascular stent-graft placement has been demonstrated to be an effective and less-invasive treatment option, particularly for patients with significant comorbidity [Iannelli 2004; Tehrani 2006]. However, clinical management of these patients is still important because of controversial approaches regarding diagnosis, treatment choices, and the timing of treatment modalities [Iannelli 2004; Reed 2006; Tehrani 2006].

### CASE REPORT

A 57-year-old man was admitted to our institution after a traffic accident. He had stable vital signs but was complaining of pain at the sternum and the right shoulder. Multiple rib fractures of the left hemithorax and fractures of the right humerus and scapula were determined on the x-ray examination. Computed tomography (CT) revealed a 1-cm diameter of extravasation of contrast material at the descending aorta surrounded by a hematoma, which was compatible with the TTAT (Figure 1A). The patient was prepared for emergency endovascular stent-graft placement at the interventional cardiology theater. Under general anesthesia, a 5 F

pigtail catheter was inserted via the left femoral artery to localize the transection zone. We have clearly demonstrated at the CT scan that there was no evidence of extravasation at the angiographic images (Figure 2A). The delivery system was advanced through the abdominal and thoracic aorta via the right femoral artery. The proximal end of the graft (30-sized Talent endovascular stent graft; Medtronic, Minneapolis, MN, CA, USA) was placed at the descending aorta, distal to the origin of the left subclavian artery. The completion angiography revealed excellent patency with no endoleak, and the left subclavian artery was regularly perfused (Figure 2B). The patient was transferred to the intensive care unit with stable hemodynamic parameters. The postoperative period was uneventful. The patient was then operated on for orthopedic pathologies on the sixth day of the endovascular procedure. The clinical findings were stable. The patient was discharged after a 16-day overall hospital stay without any complication. Control CT at the first month revealed a patent stent with no evidence of endoleak (Figure 1B).

### DISCUSSION

TTAT is a life-threatening aortic pathology that is described in acute aortic syndromes [Ahmad 2006]. These

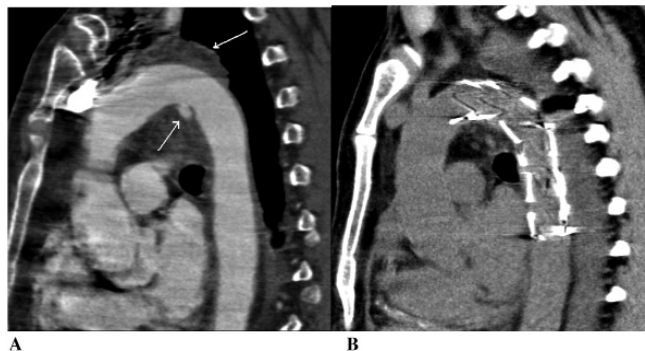


Figure 1. A, Computed tomographic scan of extravasation of contrast material at the descending aorta (minor curvature) surrounded by the hematoma (major curvature). B, One month follow-up computed tomographic scan of aortic endovascular stent graft showing no endoleak.

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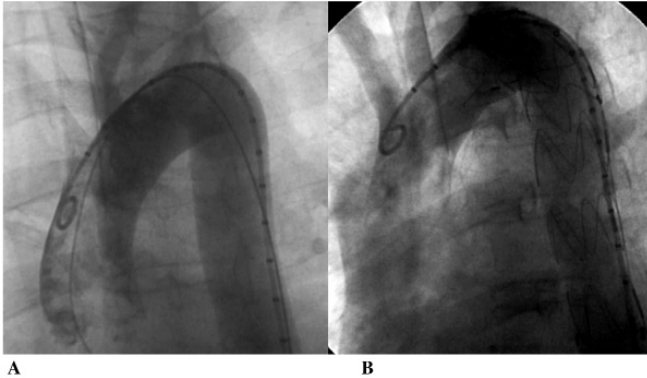


Figure 2. A, Perioperative angiographic scan of the injured segment of aorta with no evidence of extravasation, which has been clearly demonstrated on the computed tomographic scan. B, Completion angiographic scan of the endovascular stent with no endoleak.

pathologies possess the risk of aortic rupture; therefore, diagnostic and therapeutic delay must be avoided [Ahmad 2006; Tehrani 2006]. Some reports advocate delayed treatment, especially in hemodynamically stable patients with intense arterial pressure control with unacceptable early mortality rates in nontreated patients [Reed 2006]. Since 2% to 5% of these patients develop secondary rupture mostly within one week of the initial injury and there is a subsequent mortality rate in nontreated patients of 1% per hour during the first 48 hours, the standard care for TTAT should be early repair [Holmes 2002; Iannelli 2004; Tehrani 2006].

These pathologies may not be demonstrated with angiography especially at the early-uncomplicated phase (as in our case); therefore, CT scanning should be the first choice of diagnostic tool.

Endovascular treatment of TTAT is technically safe, feasible, and can be applied to both stable and critically injured patients [Reed 2006; Tehrani 2006]. The procedure is not associated with a delay of surgical intervention for concomitant injuries [Tehrani 2006]. Therefore it can be applied for emergency use also for patients with both stable hemodynamics and clinical signs of shock with no defined disadvantage. The key point for the optimum management of patients with TTAT is to establish early proper diagnosis with CT scan and organize the endovascular team with equipped personnel competent in both open and endovascular techniques for an emergency procedure.

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