

# Life Saving Role of TEVAR in a Traumatic Aortic Transection: Case Report

## Bir Travmatik Aort Disseksiyonu Vakasında TEVAR'ın Hayat Kurtarıcı Rolü

C. Murat SONGUR,<sup>a</sup>  
Emir EROL,<sup>a</sup>  
Ferit ÇIÇEKÇİOĞLU<sup>a</sup>

<sup>a</sup>Department of Cardiovascular Surgery,  
Türkiye Yüksek İhtisas Hospital, Ankara

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Yazışma Adresi/Correspondence:

C. Murat SONGUR  
Türkiye Yüksek İhtisas Hospital,  
Department of Cardiovascular Surgery,  
Ankara,  
TÜRKİYE/TURKEY  
drmuratsongur@hotmail.com

**ABSTRACT** Traumatic thoracic aortic injury is typically fatal. However, recent improvements in pre-hospital care and diagnostic modalities have resulted in an increased number of patients with traumatic aortic injury arriving alive at the hospital. Also, the morbidity and mortality associated with endovascular repair are significantly lower than with conventional open surgery in traumatic thoracic aorta injury. We present one case of traumatic thoracic aortic dissection caused by a traffic accident and its successful management with endovascular stents.

**Key Words:** Aorta, thoracic; dissection

**ÖZET** Travmatik torasik aort yaralanmaları tipik olarak ölümcül seyredebilir. Günümüzde operasyon öncesi bakımın ve tanısal işlemlerin gelişmesi ile birlikte, tespit ve tedavi edilen travmatik aort yaralanmalı hasta sayısında artış olmuştur. Bu hastalarda endovasküler onarımlara bağlı mortalite ve morbidite oranlarının açık cerrahiye göre daha düşük olduğu gözlenmiştir. Bu olgu sunumunda trafik kazası sonrası travmatik torasik aort transeksiyonu bulunan hastaya uyguladığımız endovasküler onarımı sunduk.

**Anahtar Kelimeler:** Aort, torasik; disseksiyon

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Patients with blunt traumatic thoracic aorta injuries increasingly admit to hospitals since the number of traffic accidents are increasing. The thoracic aorta wall ruptures after blunt thoracic trauma, and if not treated, it has very poor outcome with an initial survival rate ranging from 10 to 30%. The hospital mortality rate is up to 32% during the first day, 61% within the first week and 74% after 2 weeks. Moreover, according to the literature, patients surviving the acute phase without surgery had a 30% risk of late traumatic thoracic aorta aneurysm rupture.<sup>1</sup>

Fortunately, acute and chronic traumatic lesions of the descending aorta can now be treated via an endovascular approach in specialized centers, with low morbidity and mortality rates.<sup>2,3</sup> We report one cases of endovascular stenting in traumatic thoracic aortic dissection, due to a traffic accident.

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## CASE REPORT

A 32-year-old male suffered from a traffic accident while he was in a car. His mental status was confused but brain computerized tomography (CT) revealed nonspecific findings. He had no known history of hypertension, diabetes, hepatitis, or pulmonary tuberculosis. He was an 8 pack-year current smoker. His family history was nonspecific. On admission, his vital signs were stable except for a blood pressure of 100/70 mmHg. A 12-lead electrocardiogram (ECG) showed normal sinus rhythm with 72 beat/min. The results of electrolyte panel and kidney function tests were all within the normal limits. The patient had a fracture at L1 spine, and had an aortic transection below left subclavian artery, as detected by CT (Figure 1).

On the physical examination, paraplegia was confirmed. Patient's hemodynamic and vital signs were stable, there were no signs of solid organ injury or bleeding from major arteries. However, paraplegia was the main challenging situation for surgery. Endovascular intervention was the main life saving choice for this patient. Thoracic endovascular aneurysm repair (TEVAR) was performed successfully, and all major branches were intact in the control aortography. Follow-up chest CT angiography showed vascular stent graft insertion state from distal aortic arch to proximal descending thoracic aorta, and resolution of previous traumatic aortic dissection (Figure 2). Patient was referred to a neurosurgery clinic for his L1 fracture with an established aorta and stabile hemodynamics.

## DISCUSSION

Acute traumatic aortic transection is a life threatening and emergent vascular surgical pathology with high mortality and morbidity. Traumatic thoracic aortic injuries are usually located distal to the left subclavian artery. Due to presence of intercostal arteries, pleura and the ligamentum arteriosum, the descending aorta is fixed more rigidly than the aortic arch and the heart during its course through the vertebral sulcus. During a horizontal deceleration trauma, the descending and other



FIGURE 1: Angiography showing traumatic aortic dissection in proximal descending thoracic aorta.



FIGURE 2: Follow-up angiography shows vascular stent graft insertion from distal aortic arch to proximal descending thoracic aorta.

parts of the aorta move at different speeds. As a result, the isthmic part of the aorta is under maximum stress, and total or partial rupture of the vessel may occur.<sup>4</sup>

Results of a meta-analysis comparing the 30-day outcomes between 278 aortic ruptures managed surgically vs. 355 managed by endovascular means showed no significant differences in injury severity or age between the groups. The endovascular group had significantly lower mortality (7.6% vs. 15.2%,  $p=0.008$ ), paraplegia (0% vs. 5.5%,  $p<0.0001$ ) and stroke (0.81% vs. 5.1%,  $p=0.003$ ) compared to the open surgical repair cohort.<sup>5</sup>

Endovascular repair is particularly attractive in managing patients whose associated injuries or comorbid conditions put them at greater risk for

open repair.<sup>6</sup> Furthermore, endovascular grafts may also be used not as a definitive treatment, but in complicated cases as a bridge therapy to definitive treatment, in selected patients who are not candidates for either medical treatment or operative treatment.<sup>7</sup> Mortality can reach to 23% in traumatic cases with concomitant injuries.<sup>8</sup> In our case, taking the neurological status and harm of thoracotomy position into consideration, endovascular intervention was the best option for emergent repair of thoracic aorta.

Despite great achievements from endovascular stent grafts, several complications of endovascular stenting have remained. Although complications do

not occur frequently, endoleak, stent collapse, subclavian occlusion, stroke, embolization, bronchial obstruction, implant syndrome, dissection, migration, and paralysis may develop.<sup>9</sup> In our case, procedure-related complications did not develop.

The surgical access is not easy in the toracoabdominal aortic surgery and the mortality and morbidity of surgery is high especially when there is trauma. Using of TEVAR in a trauma patient is a life saving treatment method in aortic transection.

### **Conflict of Interest**

*Authors declared no conflict of interest or financial support.*

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