

## Delayed endovascular repair of a traumatic aortic dissection

### *Travmatik aort diseksiyonunda geç endovasküler onarım*

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A 41-year-old male patient was admitted to our clinic after a high impact motor vehicle accident. Radiological evaluation revealed grade 2 splenic laceration, multiple fractures and type B aortic dissection with periaortic hematoma. Thoracic endovascular aortic repair was performed to distal subclavian artery with local anesthesia. Endovascular repair of thoracic aortic lesions can be accomplished with low perioperative mortality and morbidity rates. In case of multiple life threatening injuries, the patient should be stabilized hemodynamically for repair of aorta.

**Key words:** Aortic dissection; thoracic endovascular repair; trauma.

Blunt aortic injury is the second most common cause of trauma-related deaths,<sup>[1,2]</sup> and blunt thoracic trauma with concomitant aortic disruption is often lethal. Among patients who survive, the mortality rate ranges from 20-30%.<sup>[1]</sup> Motor vehicle accidents result in rapid deceleration, causing the shearing of the aortic arch at the level of the isthmus, the most frequent site of rupture (50-70%).<sup>[1,2]</sup> Emergency surgery for blunt aortic injury is associated with significant complications.<sup>[3]</sup> Endovascular aortic repair is a less invasive treatment option that allows for surgical interventions for other injuries to be performed without delay. We present a multiple trauma patient who had blunt aortic injury for whom successful thoracic endovascular aortic repair (TEVAR) was performed with local anesthesia.

Kırk bir yaşındaki erkek hasta yüksek enerjili trafik kazası sonrasında kliniğimize getirildi. Radyolojik değerlendirilmede evre 2 dalak laserasyonu, çoklu kemik kırığı ve periaortik hematomun eşlik ettiği tip B aort diseksiyonu görüldü. Lokal anestezi ile subklaviyen arterin distaline torasik endovasküler aort onarımı uygulandı. Torasik aort lezyonlarının endovasküler onarımı düşük perioperatif mortalite ve morbidite oranlarıyla gerçekleştirilebilmektedir. Çok sayıda ölümcül yaralanmaların mevcut olması durumunda, aortun onarımı için hastanın hemodinamik olarak stabilize edilmesi gerekir.

**Anahtar sözcükler:** Aort diseksiyonu; torasik endovasküler onarım; travma.

### CASE REPORT

A 41-year-old male patient was admitted to our clinic after a high impact motor vehicle accident. The patient was conscious, and he had blood pressure of 125/70 mmHg, a heart rate of 78/bpm, and a hemoglobin level of 10.9 g/dl. Fractures of the right radius, right femur and patella, left tibia, and mandible were detected. Computed tomography (CT) revealed descending aortic dissection at the level of the isthmus with a minor periaortic hematoma (Figure 1a) and a grade 2 splenic rupture with intra-abdominal free fluid. Thoracic endovascular aortic repair was scheduled, but due to the risk of bleeding after systemic heparinization, it was delayed until any potential bleeding was ruled out. Repeat CT angiography after 12 hours revealed no increase of the periaortic hematoma, but there was



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**Figure 1.** (a) Initial computed tomography angiography of the patient demonstrating the dissection of the descending aorta with a minimal periaortic hematoma. (b) Repeat computed tomography angiography after 12 hours showing no increase in the periaortic hematoma and pleural effusion.

a slight effusion in the left thorax (Figure 1b). Thoracic endovascular aortic repair was performed electively two days after the trauma when stable hemoglobin levels indicated that the risk of bleeding was minimal, and there was no increase in intra-abdominal free fluid. This procedure was performed by deploying a 26x100 mm-sized Medtronic Valiant® thoracic stent graft via the Captiva delivery system (Medtronic Inc, Minneapolis, Minnesota, USA), just distal to the left

subclavian artery with local anesthesia and mild sedation (Figure 2). The aortic repair was completed without any complications, and the patient was transferred to the orthopedic clinic after two days of follow-up in the intensive care unit (ICU). Postoperative CT angiography at one month confirmed a successful procedure with no collapse or endoleak (Figure 3).

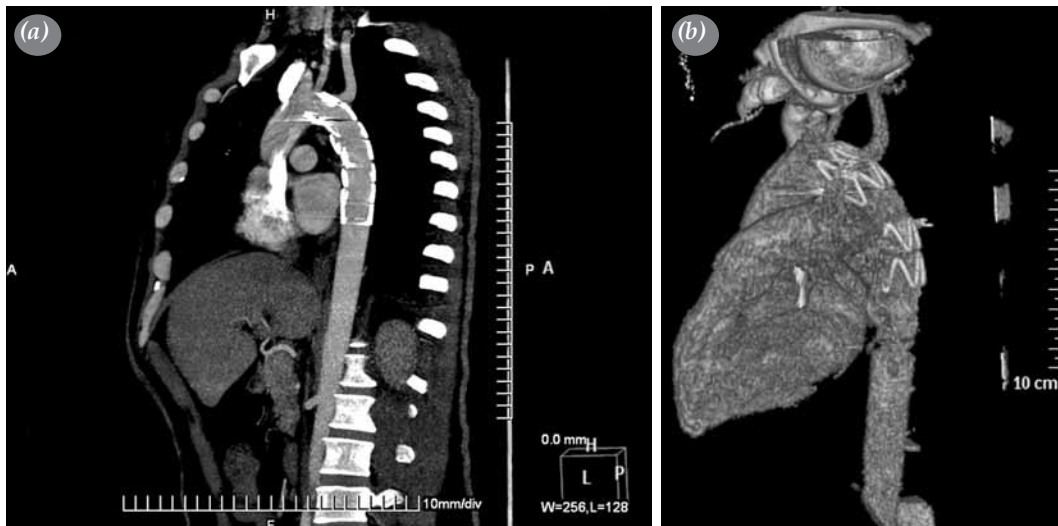
## DISCUSSION

The endovascular approach may be an alternative to surgical therapy in the treatment of traumatic injuries.<sup>[4]</sup> The deployment of a stent graft to the aorta with a focal lesion, particularly in patients with adequate proximal and distal aortic necks, can be performed easily. This procedure can be performed under local anesthesia without incurring significant cardiopulmonary stress and the commonly encountered physiological insults associated with an open repair are not seen. The absence of aortic cross-clamping minimizes blood pressure shifts and coagulopathy; consequently, operative blood loss and ischemic events are reduced. Moreover, avoiding a thoracotomy has obvious convalescent advantages.<sup>[3]</sup>

For those select patients who survive for more than three or four hours after arriving at the hospital and who remain hemodynamically stable, careful control of the heart rate and blood pressure may allow time for adequate resuscitation and for time to evaluate any associated injuries.<sup>[5]</sup> In our case, other traumatic injuries combined with the high risk of bleeding dictated delayed TEVAR. Repeat CT angiography confirmed



**Figure 2.** Initial angiographic image of the stent graft after deployment.



**Figure 3.** (a) Follow-up computed tomography angiography at one month showing the proper position of the stent graft with the patent left subclavian and left carotid arteries without any endoleak. (b) Three dimensional (3D) reconstruction of the image.

that the aortic lesion was not progressive in nature, and there was no active bleeding from that site.

In conclusion, our experience suggests that in patients with multiple injuries and a risk of bleeding, TEVAR can be delayed as long as the patient is stable. We believe this approach may decrease the risk of hemorrhage. Nevertheless, the patient should be carefully monitored to ensure strict control of the heart rate and blood pressure. In addition, repeat imaging should be conducted. Thoracic endovascular aortic repair should be performed as soon as possible to allow time for other interventions related to concomitant injuries. Timely endovascular repair of the aortic injury is advantageous, especially in patients with multiple traumas, and should be the first choice of treatment for this patient group.

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