

Case Report / Olgu Sunumu

Isolated middle sacral artery rupture after blunt abdominal trauma in a pediatric patient

Çocuk hastada künt abdominal travma sonrası izole orta sakral arter rüptürü

Mustafa Yılmaz¹, Vildan Selin Şahin², Atakan Atalay¹, Emrah Şenel²

Department of Pediatric Cardiovascular Surgery, Ankara State Hospital, Ankara, Turkey

Department of Pediatric Surgery, Ankara State Hospital, Ankara, Turkey

ABSTRACT

Blunt abdominal aortic injuries are very rare in childhood. In these injuries, abdominal aorta and intra-abdominal organs can be damaged to various degrees. In this article, we report a unique pediatric case of isolated middle sacral artery injury following trauma.

Keywords: Blunt trauma, middle sacral artery, pediatrics, rupture.

ÖZ

Çocukluk çağında künt abdominal aort yaralanmaları çok nadirdir. Bu yaralanmalarda abdominal aort ve batin içi organlar çeşitli derecelerde hasarlanabilmektedir. Bu yazıda, travma sonrası izole orta sakral arter hasarı gelişmiş benzersiz bir olgu sunuldu.

Anahtar sözcükler: Künt travma, orta sakral arter, pediatri, rüptür.

Blunt abdominal aortic injuries are very rare in childhood. In a comprehensive study from Canada, only 15 patients presented with blunt abdominal aortic injury amongst 11,465 pediatric trauma admissions. It is commonly accompanied by intra-abdominal organ damage and neurological deficits.^[1] No consensus guidelines have been published regarding the management of blunt aortic injuries in pediatric patients. Since pediatric aortic blunt injuries are associated with mortality and morbidity, it is of utmost importance to ensure correct diagnosis and treatment.^[2]

In this article, we present a unique pediatric case of isolated middle sacral artery injury following falling from a height and rolling.

CASE REPORT

A 12-year-old male patient was admitted to the emergency department following falling from a height and rolling. In the initial evaluation, the patient

had stable vital signs. During follow-up, the patient complained about abdominal tenderness and pain. On physical examination, there was no abdominal palpable pulsatile mass or distension. Peripheral pulses were intact. Abdominal ultrasonography (USG) showed no evident intra-abdominal pathology. There was no significant decrease in the hemoglobin level; however, the patient was complaining of increasing abdominal pain. The patient who had multiple extremity fractures and diffuse soft tissue damage was suspected to have an abdominal aortic injury and whole-body computed tomography (CT) angiography was performed which revealed an extravasated contrast agent with a diameter of 16x6 mm connected to the aortic lumen just proximal to the iliac bifurcation posterior to the abdominal aorta (Figure 1). The presentation was compatible with an aortic rupture. Endovascular treatment was not considered appropriate due to the growing age and small vessel diameters of the patient. An urgent surgery was decided. A written informed consent was obtained from each parent.

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Correspondence: Mustafa Yılmaz, MD. Ankara Şehir Hastanesi Çocuk Kalp Damar Cerrahisi Kliniği, 06800 Çankaya, Ankara, Türkiye.
Tel: +90 312 - 552 60 00 e-mail: mustafayz1983@gmail.com

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Figure 1. A computed tomography angiography image showing bleeding restricted to retroperitoneum. Black arrow indicates bleeding limited to retroperitoneum. Grey arrow indicates abdominal aorta and white arrow indicates inferior vena cava.

Laparotomy was performed under general anesthesia. There was no intra-abdominal organ injury, hematoma or active bleeding. The retroperitoneal region was explored and the abdominal aorta was dissected distally to the main iliac arteries and proximally to the inferior mesenteric artery. Self-limiting bleeding was noted. The retroperitoneal diffuse hematoma was removed. No damage was observed in the anterior and lateral walls of aorta. Active bleeding was noted on the posterior aortic wall. A vertical incision to the abdominal aorta was performed, and the exact location of the bleeding was identified (Figure 2). The bleeding was originating from the middle sacral artery. The artery was transected from the aortic outlet and its distal stump was detected in the hematoma. The distal stump was clipped, and the proximal aortic outlet was repaired with pledgeted suture. The aortotomy was, then, closed.

Postoperative follow-up was uneventful. The patient was discharged on the fifth postoperative day.

DISCUSSION

Blunt abdominal aortic injuries are very rare in childhood, and is approximately 20 times less common compared to thoracic aortic injuries.^[3,4] The first case of a blunt abdominal aortic injury was reported in 1966 and, so far, only 50 cases have been reported in the English literature. To date, no guidelines have been published on approach and treatment to this patient group, as this is a rare condition.^[5] Regardless of the age of the patient, blunt aortic injuries are a serious cause of mortality and, therefore, correct diagnosis and treatment are essential.^[2]



Figure 2. The detection of the transected median sacral artery through the abdominal aorta and the clamp was localized into the transected artery.

Although the elastic aortic structure of the pediatric patients and the retroperitoneal location of the aorta naturally reduce the risk of aortic injury, blunt abdominal aortic injury may occur with various underlying mechanisms.^[2,3] These injuries are usually full-thickness ruptures of the aortic wall, partial or circumferential transection of the aortic intima, and pseudoaneurysm formation in the aorta.^[1] In this case, we, for the first time in the literature, present that the wall of the abdominal aorta is completely preserved with only a single arterial vessel rupture.

Pediatric patients exposed to blunt aortic trauma may be hemodynamically stable, despite severe aortic injury at the initial evaluation. Diagnosis should be made quickly and through CT as the most reliable method. The CT angiography is the most commonly used imaging modality owing to its high accuracy, rapid application, and the possibility of three-dimensional reconstruction.^[4] However, unstable patients should not be waited for imaging and should undergo laparotomy immediately, if necessary.^[2]

Furthermore, there is no consensus in the literature regarding the management of blunt aortic injuries in pediatric patients. Open surgical repair, endovascular intervention, and close follow-up under medical treatment are among the treatment options.^[3,6] Some authors have suggested that close follow-up with blood pressure control can be applied to abdominal aortic injuries in patients with stable hemodynamics, distal pulses, and no peripheral perfusion disorder.^[6] Similarly, it has been reported that close medical follow-up may be appropriate in patients whose general condition is not considered

suitable for a major aortic operation due to other organ injuries. Sadaghianloo et al.^[1] in a case report and literature review showed that surgical intervention was performed in 28 (70%) of 40 cases with a blunt abdominal aortic injury between 1966 and 2011. Five of these patients had a full-thickness aortic wall rupture and all patients underwent emergency surgery. Of 15 patients with circumferential intimal transection, 10 underwent emergency surgery and four underwent follow-up. In addition, the majority (69%) of 13 patients with partial intimal transection did not undergo urgent or elective surgery. Similarly, six patients who developed a pseudoaneurysm after blunt trauma were not urgently operated. Four (67%) of these patients were followed in the long-term and two of them were recommended for late surgery.

Endovascular treatment is also available for pediatric blunt abdominal aortic injuries. To date, there are only two cases reported to be treated with this method in the literature. The main advantages of this method over open surgery are that the procedure-related blood loss is less than the open method, it is less invasive, and the healing and length of hospitalization are shorter.^[7] Since it prevents the contamination of the retroperitoneum, the risk of graft infection is also low.^[7] However, some authors are cautious about this treatment due to the small size of the vessel to be intervened, the suspicion that the graft may remain small in the growing age, possible endoleak formation, migration of the stent in the growing aorta at advanced ages, and inadequate long-term outcomes.^[4] In our case, we did not prefer endovascular treatment due to these possible risks.

In conclusion, blunt abdominal aortic injuries are rare. Blood pressure control and close medical follow-up

can be performed in patients with minor aortic injury and hemodynamically stable patients. Since these patients are often accompanied by additional organ injuries, it would be wise to evaluate each patient separately and decide which treatment method is more appropriate according to the clinical condition.

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