Official Journal of Erciyes University Faculty of Medicine

DOI: 10.14744/cpr.2025.63557
J Clin Pract Res 2025;47(4):440–443

Delayed Dysphagia as a Rare Presentation of Blunt Aortic Trauma: A Case of Aortic Pseudoaneurysm Following a Motocross Injury

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At the APIC 2019 Meeting / Advanced Peripheral Interventions Course – Acute Stroke Intervention Course, held in Kayseri on February 21–23, 2019, this study was presented with the number OP (CP-43), titled Surgical Treatment of Pattern Aortic Rupture: A 25-Year-Old Male Patient.

Cite this article as:
Sarı G, Çelebi Ş, Tunçay A, Yılmaz H. Delayed Dysphagia as a Rare Presentation of Blunt Aortic Trauma: A Case of Aortic Pseudoaneurysm Following a Motocross Injury. JClinPractRes2025;47(4):440–443.

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Submitted: 07.05.2025
Revised: 30.06.2025
Accepted: 18.07.2025
Available Online: 25.08.2025

Erciyes University Faculty of Medicine Publications - Available online at www.jcpres.com

ABSTRACT

Background: Blunt aortic injuries (BAI) are associated with a high mortality rate, with 80-90% of patients dying within the first hour after trauma. They represent the second most common cause of death in trauma patients. The most common site of aortic injury is the isthmus, typically resulting from high-energy trauma such as motor vehicle collisions or falls from significant heights.

Case Report: We present a case of a 25-year-old male who fell 15 meters during a motocross accident, sustaining a hemothorax. He was treated at a trauma center and discharged. One month later, he presented with dysphagia. Computed tomography angiography (CTA) revealed a BAI with a pseudoaneurysm compressing the esophagus. The patient then underwent surgical repair.

Conclusion: Prompt diagnosis with CTA and timely surgical intervention are crucial in managing BAI. This case underscores the importance of considering surgical repair in situations where endovascular options are unavailable, enabling favorable outcomes and full recovery.

Keywords: Aortic injuries, blunt trauma, dysphagia, pseudoaneurysm, thoracic surgery.

INTRODUCTION

Traumatic aortic injuries, particularly at the isthmus, most often result from high-energy impacts such as motor vehicle accidents or falls from significant heights. Blunt aortic injury (BAI), although infrequent, is a critical condition associated with high mortality, with many patients dying before receiving medical attention or shortly after arrival. Prompt diagnosis and timely treatment are essential for improving survival outcomes.

This case report describes a 25-year-old man who sustained a traumatic aortic pseudoaneurysm following a motocross accident. The injury led to significant dysphagia and aortic lumen coarctation, necessitating surgical intervention. The procedure successfully resolved the patient's condition.

Management of BAI has evolved, with thoracic endovascular aortic repair (TEVAR) now favored due to its lower morbidity and mortality compared with open surgical repair (OSR). However, OSR

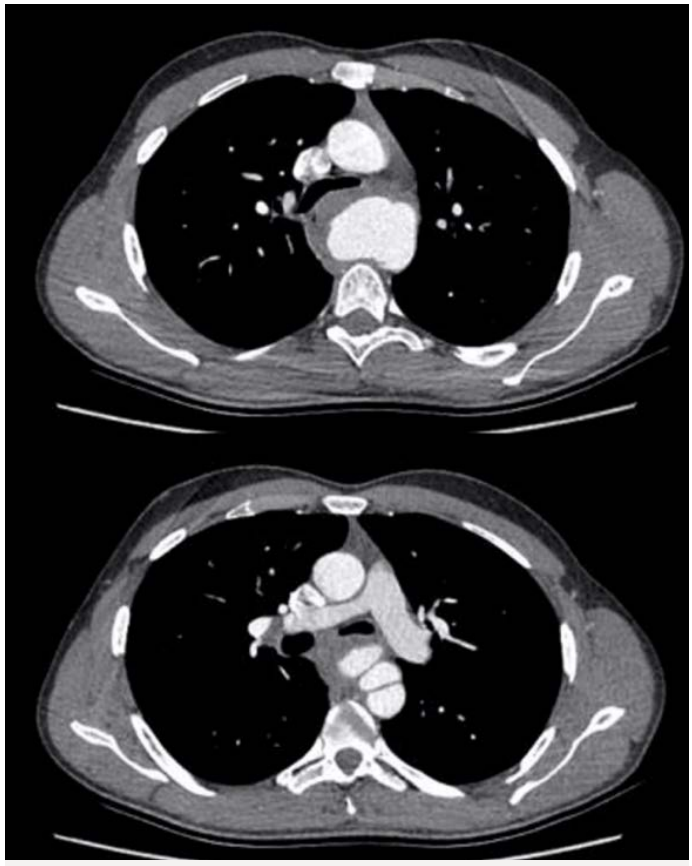

Figure 1. Computed tomography angiography (CTA) image obtained prior to surgical intervention, showing the presence of a pseudoaneurysm.

Figure 2. The figure below illustrates the surgical intervention involving excision of the pseudoaneurysmal segment. This procedure was performed using a combination of surgical and bypass techniques, employing a size 24 Dacron graft with shunting and cross-linking methodologies.

remains the treatment of choice when endovascular options are contraindicated or not feasible. This case highlights the complexity of managing BAI complicated by pseudoaneurysm formation and compression of adjacent structures, including the esophagus. It also discusses the diagnostic difficulties, treatment strategies, and outcomes associated with OSR, emphasizing the importance of early recognition and individualized treatment to optimize patient prognosis.

CASE REPORT

A 25-year-old male patient reportedly fell from a height of 15 meters while participating in motocross. The initial post-traumatic computed tomography (CT) scan revealed no abnormalities other than a hemothorax resulting from rib fractures. The patient was discharged following treatment. For the following month, he was only able to consume liquids and experienced persistent dysphagia. As evaluations at the initial treating facility revealed no pathology, he was referred to a higher-level institution. Contrast-enhanced computed tomography angiography (CTA) (Fig. 1) demonstrated a pseudoaneurysm of the aorta measuring 49 × 36 mm. The pseudoaneurysm and associated hematoma were compressing the esophagus. After thorough evaluation and consultation with the cardiology department, OSR was deemed the most appropriate option due to severe dysphagia and coarctation. Surgery was performed via a posterolateral thoracotomy. The tissue adherent to the aorta was carefully dissected. As the aortic tissue was irreparable, the pseudoaneurysmal segment was excised and replaced with a 24 Dacron graft, using shunting and cross-clamping techniques (Fig. 2). The patient was scheduled for discharge on postoperative day five. At that time, he exhibited no dysphagia or other symptoms. A follow-up CTA performed 10 days after discharge revealed no abnormalities (Fig. 3).

DISCUSSION

Trauma accounts for 10% of global deaths and 4% of deaths in the United States during the first four decades of life.[1] BAI is the second leading cause of death among trauma patients, responsible for 16% of all traumatic fatalities but occurring in only 1% of motor vehicle accidents. More than 75% of patients with BAI die before reaching the hospital, and among survivors, the 24-hour mortality rate exceeds 50%. Motor vehicle

Figure 3. Three-dimensional computed tomography angiography (CTA) performed on postoperative day 10 during the patient's follow-up evaluation.

collisions are the most common cause, with BAI occurring predominantly in young and middle-aged males. Motor vehicle accidents and falls from heights are common causes of BAI.[2] CTA provides detailed information about the aorta and surrounding structures, helping to differentiate aortic diseases. The modality is widely available in most medical centers and produces rapid results. CTA has a sensitivity of 100% and a specificity of 98–99%.[3] Its three-dimensional reconstructions, dynamic images, and comprehensive detail can improve surgical planning and endovascular procedures. Thus, contrast-enhanced CT is the best imaging technique for detecting and managing BAI.[4] The Ishimaru classification uses CTA to diagnose pathology and guide treatment strategies for surgical and endovascular thoracic aortic diseases. It categorizes five TEVAR landing zones:

- Zone 0: Origin of the innominate artery;
- Zone 1: Origin of the left common carotid artery;
- Zone 2: Origin of the left subclavian artery;
- Zone 3: Proximal descending thoracic aorta up to the T4 vertebra;
- Zone 4: Remaining thoracic aorta.[5]

The most common site of BAI is the aortic isthmus, located on the medial lumen aspect of the descending aorta and distal to the origin of the left subclavian artery. This location marks the transition from the mobile aortic arch to the fixed descending aorta.[6]

Multiple classification systems have been proposed to assess aortic injury, with the primary method guiding initial treatment decisions:

- Grade 1: Intimal tear;
- Grade 2: Intramural hematoma;
- Grade 3: Pseudoaneurysm;
- Grade 4: Rupture.[7]

The optimal timing for intervention has long been debated. A multicenter study found that 10% of hemodynamically stable hospitalized patients progressed to free rupture within 24 hours, supporting emergency intervention as the standard approach until the final stage.[8] Management options for blunt thoracic aortic injury include medical therapy, TEVAR, and OSR.[9] Patients with Grade 1 or 2 BAI are generally treated conservatively with medical therapy and regular follow-up. Magnetic resonance imaging and CTA are recommended for monitoring Grade 1 injuries with intimal tears. For Grade 2 injuries, the Society for Vascular Surgery Clinical Practice Guidelines recommend endovascular stenting or OSR.[10]

Due to its favorable early and late outcomes, TEVAR has become the standard treatment for Grade 3 BAI with pseudoaneurysm in many centers. OSR is the standard therapy for severe BAI, although it carries significantly higher morbidity and mortality, especially in polytrauma patients. Endovascular treatment is generally preferred for aortic repair because of its better perioperative outcomes. TEVAR has been shown to reduce mortality, with reported rates of 7.2% compared to 23.5%. However, not all patients are eligible for endovascular therapy, and OSR is often the best option when endovascular treatment is not feasible or when the patient's anatomy is unsuitable. An extensive review of open repair highlights key technical considerations, including spinal protection, vascular control, perfusion strategies, and adequate thoracic cavity access. For patients of all age groups with suitable anatomy, the Society for Vascular Surgery recommends TEVAR over OSR to reduce the risk of spinal cord injury and death.

CONCLUSION

Blunt aortic injury is a severe and often fatal consequence of trauma, primarily affecting young and middle-aged males involved in motor vehicle accidents or falls. Timely and accurate diagnosis, most effectively achieved with CTA, is essential for successful management. Treatment strategies vary by severity,

ranging from conservative medical therapy for minor injuries to TEVAR or OSR for more severe cases. TEVAR has become the preferred approach because of its lower morbidity and mortality rates compared with OSR, although eligibility depends on patient anatomy and clinical condition. Clinicians should maintain a high index of suspicion for vascular injuries in patients presenting with delayed or unexplained post-traumatic symptoms, such as dysphagia, as early recognition substantially improves outcomes.

Ethics Committee Approval: This is a single case report, and therefore ethics committee approval was not required in accordance with institutional policies.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Use of AI for Writing Assistance: Not declared.

Author Contributions: Concept – GS, SÇ, AT, HY; Design – GS, ŞÇ, AT, HY; Supervision – GS, ŞÇ, AT, HY; Resource – GS; Materials – GS; Data Collection and/or Processing – GS, ŞÇ, AT, HY; Analysis and/or Interpretation – GS; Literature Search – GS; Writing – GS; Critical Reviews – GS, ŞÇ, AT, HY.

Peer-review: Externally peer-reviewed.

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