



# Subclavian Artery Pseudoaneurysm after Blunt Chest Trauma: A Case Report

Mosavari H<sup>1\*</sup>, Farahani S<sup>1</sup> and Saberi A<sup>2</sup>

<sup>1</sup>Student Research Committee, School of Medicine, Iran University of Medical Sciences, Iran

<sup>2</sup>Department of General Surgery, Rasool-e-Akram Hospital, Iran University of Medical Sciences, Iran

## Abstract

Delayed presentations of traumatic subclavian artery injury (e.g., pseudoaneurysm) are sometimes challenging to diagnose. We present a unique case of left subclavian artery pseudoaneurysm in a 72-year-old male who presented to us two months after blunt chest trauma without any signs of fracture of the left clavicle or first rib. The patient presented to the emergency department with swelling on his upper left hemithorax accompanied by a dull pain and decreased muscle strength. Physical examination showed neurovascular deficits and an absent radial pulse. A Computed Tomography Angiogram (CTA) was performed due to high suspicion of underlying vascular injury and revealed a large pseudoaneurysm in the second part of the left subclavian artery. This was managed operatively with an open surgical approach by evacuating the pseudoaneurysm and repairing the subclavian artery wall. Subclavian artery injury is uncommon but associated with high mortality and morbidity. This case suggests that trauma patients with signs and symptoms of subclavian artery injury, including progressive swelling in the clavicular, the first rib and clavicular fracture, absence of distal pulses, and decreased muscle forces, should undergo further vascular investigations (e.g., CTA) to rule out possible subclavian artery injury.

**Keywords:** Subclavian artery; Blunt chest trauma; Subclavian pseudoaneurysm; Subclavian artery injury; Vascular injury

## Abbreviations

SAI: Subclavian Artery Injury; CTA: Computed Tomography Angiogram

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### \*Correspondence:

Hesam Mosavari, Student Research Committee, School of Medicine, Iran University of Medical Sciences, Iran, Tel: 989124278745;

E-mail: hesammosavari@gmail.com

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## Background

Traumatic Subclavian Artery Injury (SAI) is rare but often life-threatening [1]. It usually requires urgent care, but delayed consequences such as pseudoaneurysm or thrombosis rarely occur [2,3]. Penetrating mechanisms cause most traumatic SAIs, and blunt force traumas rarely cause damage to subclavian arteries. That is mainly due to the great musculoskeletal protection of subclavian vessels [4-6].

Diagnosing SAI is often challenging because the injury process is sometimes more subtle without obvious clues [7]. Adjacent bone fractures and peripheral vascular and neurological signs and symptoms can point to a possible SAI and prompt more investigations [6,8,9].

Herein we present a case of left subclavian artery pseudoaneurysm without any bone fractures in an elderly male patient with a history of blunt trauma two months before admission.

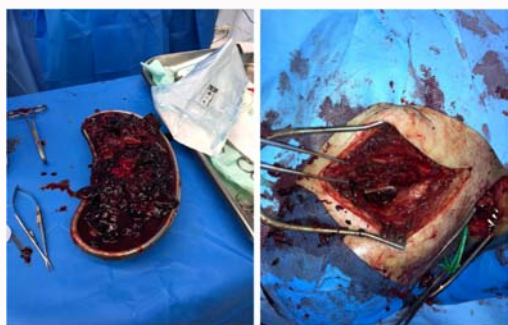
## Case Presentation

A 72-year-old man presented to our emergency department with a progressively enlarging swelling and an acute exacerbation of chronic pain in his left upper hemithorax. He had a history of blunt trauma to the chest and upper limbs two months before admission. He reported that he fell to the ground in an accident and was beaten under the legs of his sheep. Subsequently, he developed pain in the left arm and hemithorax and bruising in the left clavicular area. After almost one month, he was hospitalized with a swelling in the left clavicular region. Shoulder and chest X-ray imaging's were done and reported normal without any signs of bone fractures. The swelling was diagnosed as a hematoma and drained with a needle. The patient was discharged with analgesics and advised to rest.

On admission, vital signs were stable. Physical examination revealed a vascular murmur on



**Figure 1:** Computed tomography angiogram showing a pseudoaneurysm arising from the left subclavian artery. The red arrow shows the exact spot of subclavian artery injury.



**Figure 2:** Evacuated thrombosis tissue and hematoma trapped inside the pseudoaneurysm.

auscultation and a thrill in the left clavicular region. The axillary and brachial pulses on the left arm were not palpable, although the capillary filling was normal. The patient demonstrated a progressive loss of sensation in the left arm, confirmed by neurological examination. Examination of Radial, Ulnar, and Median nerves showed an impaired neuromuscular function. The patient could move his left arm only when the resistance of gravity was removed.

Due to high suspicion of underlying vascular injuries (i.e., a mass or a traumatic arteriovenous fistula), a Computed Tomography Angiogram (CTA) was done. CTA revealed (Figure 1) a large pseudoaneurysm (12 cm × 20 cm) in the second part of the left subclavian artery.

He was later scheduled to undergo surgical intervention. First, the first part of the subclavian artery was clamped after a supraclavicular incision to minimize the bleeding. The pseudoaneurysm was approached *via* an infraclavicular incision and dissecting major pectoral muscle, then a large amount of hematoma and blood clots was evacuated (Figure 2). The defected region was the posterior wall of the third part of the subclavian artery, which was repaired with a 6.0 Prolene suture.

Two months after the repairment of pseudoaneurysm, physical examination revealed intact palpable peripheral pulses and a significant improvement in muscle strength of the left arm.

## Discussion

Subclavian Artery Injury (SAI) is an uncommon, life-threatening complication in less than 5% of trauma patients [4,10]. Most of the reports of trauma to the subclavian artery demonstrate a high mortality and morbidity rate, mainly because of the coexisting injuries to other organs, including the brain, lungs, and brachial plexus [11].

Penetrating mechanisms causing SAIs are substantially more common than blunt mechanisms. The subclavian artery is well-protected by bones (including the clavicle, scapula, and first rib), muscles, and connective tissue [4-6]. Hence, blunt forces are less likely to damage the subclavian artery, but when they do, it is most likely due to contusion or laceration caused by bony fragments from fractures of the surrounding bones [12]. There was no evidence of fractures of the scapula, first rib, or clavicle on shoulder and chest X-ray imaging in our patient.

Sequels of the trauma may vary by mechanism. The formation of a pseudoaneurysm is common with penetrating trauma and extremely rare with blunt traumas [2]. Pseudoaneurysms form when the blood leaks from a localized disruption of a blood vessel wall and collects in the surrounding soft tissue. Pseudoaneurysms can lead to limb ischemia or cerebral ischemia due to thromboembolism or even rupture in 10% of cases [13].

Diagnosis of SAI and its sequelae (a pseudoaneurysm in our case) can be complicated since collateral vessels support the blood supply of the upper limbs. Patients with delayed signs and symptoms after blunt trauma to the chest with the absence of the radial pulse, clavicular region hematoma/swelling, brachial plexus palsy, and especially a delayed capillary filling should undergo a CTA to rule out a possible SAI [1].

Minimal damages to subclavian artery intima or occlusions with absent signs of ischemia can be managed conservatively; anticoagulation therapy and serial imaging (CTA or ultrasound) are recommended [11]. Higher grade injuries and serious complications like pseudoaneurysms should be managed with surgical intervention, either with an open or endovascular approach [1,4,11].

## Conclusion

Any patient complaining of swelling in the supra- and infra-clavicular regions with a positive history of trauma should be examined to detect any neurovascular deficits, including the absence of distal pulses or decreased muscle forces. Signs of neurovascular deficit warrant more investigations, including a CTA.

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