

# Clavicular Fracture Associated with Subclavian Artery Lesion: Case Report and Review of the Literature

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## Learning Point of the Article:

Clavicle fractures, though often benign, can be associated with subtle but life-threatening subclavian artery injuries requiring high clinical suspicion and prompt intervention.

## Abstract

**Introduction:** Clavicle fractures are common, accounting for approximately 10% of all fractures, with midshaft fractures being the most prevalent. Despite the proximity of the subclavian artery to the clavicle, vascular injuries occur in <1% of cases.

**Case Report:** We present a case of a 36-year-old male with a midshaft clavicle fracture associated with subclavian artery transection. The subtle clinical signs of this severe injury can lead to delayed diagnosis and subsequent complications. We reviewed the literature of this rare injury, including 79 cases, to evaluate its clinical presentation and to formulate recommendations regarding diagnosis and treatment.

**Conclusion:** Awareness of this potentially life-threatening injury is important. Clavicle fractures may conceal life-threatening subclavian artery injuries, highlighting the need for careful vascular assessment and timely management.

**Keywords:** Clavicle, fracture, subclavian artery

## Introduction

Clavicle fractures occur frequently both in adult and pediatric patients, making up about 10% of all fractures. They typically result from direct blunt trauma to the clavicle or lateral shoulder. Most of these fractures occur in the midshaft and are typically managed conservatively with good results. The subclavian artery is in proximity to the midshaft clavicle (artery mean 17.02 mm and vein 12.45 mm) [1] but associated vascular lesions are rare and are estimated to occur in <1%. [2]. The signs of subclavian arterial injury can be subtle, especially in blunt trauma; however, urgent operative treatment is required. This study aims to provide an overview of orthopedic and vascular treatment in these specific conditions, based on a case report from our own trauma center combined with a review of the literature.

## Case Report

A 36-year-old man was admitted to our emergency department after falling with his mountain bike. The patient reported pain in the left clavicle and shoulder girdle region and difficulty to elevate the upper extremity. Mild swelling and local tenderness over the left midshaft clavicle were present. The ipsilateral upper extremity had a normal appearance, no discoloration, and neurological examination was normal. Pulsation of the radial artery at wrist level was weaker compared to the contralateral side. Medical imaging of the left shoulder region is shown in Fig. 1, 2, 3.

Urgent surgical exploration under general anesthesia was performed. An oblique incision was made over the clavicle, centered on the fracture site. During exploration of the fracture

## Author's Photo Gallery



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**Figure 1:** Radiographic imaging of the affected left shoulder region: Slightly displaced, comminuted midshaft clavicle fracture.

fragments, massive bleeding from the medial side of the fracture was encountered. The subclavian artery was mobilized proximally and distally from the fracture. Heparin was administered at 300 IU/kg, followed by proximal and distal control of the bleeding with arterial clamps. Complete transection of the anterior arterial wall was observed, with only a small piece of adventitia remaining on the posterior wall. A venous patch, taken from the ipsilateral greater saphenous vein, was sewn in place using 5-0 Prolene (Ethicon, Cornelia, USA) sutures. After proper de-airing, the clamps were removed, and good peripheral pulsations were confirmed. Protamine was administered to reverse the heparin. Second, the clavicle fracture was reduced and stabilized with 2 anteroposterior lag screws and anatomical locking clavicle plate (DePuy Synthes). Postoperatively, acetylsalicylic acid 80 mg was administered daily for 4 weeks. The post-operative course was uneventful with adequate revascularization of the upper extremity and successful bone healing.

Assessment 6 months after surgery demonstrated a full active range of motion of the left shoulder and flow permeability of the left subclavian artery on duplex ultrasound (Fig. 4).

### Discussion

Most clavicular fractures are isolated injuries, but associated lesions of the subclavian artery are possible due to its proximity to the fracture site. Subclavian and axillary artery injuries account for 5–10% of arterial trauma in civilians [3]. This potentially life-threatening injury could easily be missed, as symptoms can be very subtle. Posttraumatic subclavian artery lesions can present acutely as lacerations, dissections, pseudoaneurysms, or occlusion. Delayed presentation is also possible due to compression caused by callus formation.

The first case of subclavian artery lesion combined with

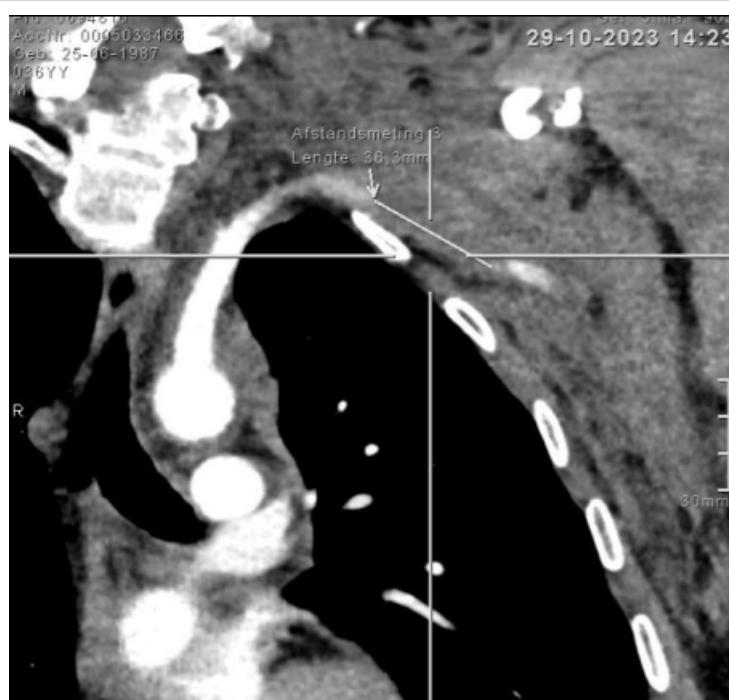
clavicle fracture was reported in 1873 by Erichsen after initial conservative treatment and subsequent decompression incisions and even shoulder disarticulation, the patient ultimately died [4]. Since then, 78 more cases of subclavian vessel injury combined with clavicular fractures after blunt trauma have been reported. An overview of the literature is presented in Table 1.

Of these cases, 41 (51.9%) were male, 20 (25.3%) were female, and in 18 (22.8%) cases, gender was not specified. Trauma mechanisms were road traffic accidents (24.1%) cases resulted from road traffic accidents, sports injuries (8.9%), fall from height (27.8%), crush trauma at work (2.5%), or not specified (36.7%). Open clavicular fracture was present in 1.2%.

Conservative treatment of the lesion of the subclavian artery was initiated in 46 cases (58.9%), but later conversion to medical treatment of the vascular lesion was necessary in 34 (43.0%) cases due to secondary thrombosis, occlusion, (pseudo)aneurysm, or arterial compression from fracture callus formation.

Typically, the subclavian artery lesion is treated first, and different approaches are possible.

Endovascular repair is preferred as it is a minimally invasive treatment. The brachial artery offers a direct and short route to



**Figure 2:** Computed tomography - scan of the left shoulder region without contrast: Visualization of a non definable portion of the left subclavian artery with a length of 36 mm.





**Figure 3:** Computed tomography - angiography confirms the lesion of the left subclavian artery.

the injury site. Alternatively, the femoral approach can be used [5]. Endovascular repair is only indicated if the vessel is partially damaged, allowing a guide wire to pass beyond the injury, followed by a covered stent to seal the defect. Up to 80% of subclavian and axillary artery injuries can be treated endovascularly, resulting in reduced blood loss, shorter operating times, lower in-hospital mortality, and decreased hospital stays [5,6]. Five-year patency rates for covered stents in the subclavian artery exceed 80% [7]. However, there is a risk of intimal hyperplasia and later occlusion, which can be managed postoperatively, where long-term results of endovascular therapy for subclavian artery lesions are excellent [8,9]. A potential drawback is the risk of occluding the vertebral artery, which can be challenging to identify in an acute setting.

A hybrid approach has been described, with balloon occlusion for proximal control bleeding, followed by open repair [10]. The indication for a hybrid endovascular and open approach is to establish proximal bleeding control with an occlusive balloon, followed by open inspection of the vessel wall. This is usually done in cases when imaging indicates a partially or fully transected vessel, which might compromise the success of an endovascular-only approach. The hybrid technique allows for controlled dissection in a non-actively bleeding field, minimizing trauma to adjacent structures and facilitating detailed inspection and reconstruction of the vessel wall [10].

An open approach is necessary when dealing with a complete subclavian artery transection [11]. Furthermore, associated neurological or vascular lesion is typically an indication for surgical exploration and stabilization of the clavicular fracture [12]. In these cases, the clavicle fracture can be used as a window to expose the underlying subclavian vessels. Younger patients may also benefit from the open approach, where long-term patency is a primary concern.



**Figure 4:** Radiographs 6 months after trauma demonstrate complete bony healing of the clavicle fracture.

Full recovery without any complications was reported in 52 cases (65.8%). Revision surgery was required in 1 (1.2%) case. 2 (2.5%) patients lost their affected upper limb and died shortly after.

Clavicle fractures can be treated conservatively depending on the location, displacement, and comminution of the fracture. Open fractures or fractures with compromised skin are strict indications for surgery.

Plate and screw osteosynthesis is most commonly used because it allows anatomical reconstruction of the fracture and solid fixation. This is probably preferable to minimize motion and possible compression at the vascular repair site. The availability of pre-contoured anatomical plates that fit the clavicle's natural curve allows precise fracture reduction. Dynamic compression plates apply pressure at the fracture site to encourage faster healing, while locking plates are particularly useful in osteoporotic and comminuted fractures, providing extra stability. Both superior and anteroinferior placement of the plate and screw osteosynthesis have been described. Superior plating has traditionally been favored because it provides fixation on the tension side of the fracture. However, complications such as hardware prominence and concerns about screw trajectory angles, which could risk the subclavian artery, have led to increased interest in anteroinferior plating. Interfragmentary screws and cerclage wires can augment the stability of the construct [13-16].

Alternatively, clavicle fractures can be stabilized by inserting a rod or pin into the bone's medullary canal. This is a less invasive option with minimal soft tissue disruption and is especially effective for simple, displaced midshaft fractures. However, intramedullary nailing allows some motion at the fracture and the vascular repair site and has specific possible complications, including pin extrusion and skin irritation [13-16].

Table 1: Clavicular fracture with subclavian artery lesion.

Authors	Year	Age	Gender	Trauma	Vascular lesion	Clavicle fracture type	Additional injuries	Symptoms	Imaging	Delay before surgical repair	Treatment vascular	Treatment orthopedic	Outcome
Erichsen	1873	27	M	Timber fell on shoulder	Compression and laceration of the subclavian vein	Midshaft comminuted	xxx	Pain, swelling	None	Conservative	Open	Shoulder disarticulation	Death
Taylor et al	1903	62	M	Fall	Aneurysm	Midshaft comminuted	xxx	Pain, swelling, sensory deficit, vascular deficit	X-ray	2 weeks	Open	(Partial) claviclectomy	Full recovery
Cayford et al	1931	22	M	Fall	Pseudoaneurysm	Midshaft simple	xxx	Pain, swelling, sensory deficit, motor deficit, vascular deficit	X-ray	5 years	Open	Conservative	Revision required
Dash et al	1960	xxx	xxx	xxx	Compression of subclavian vessels	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Guilfoil et al.	1967	55	M	xxx	Occlusion of subclavian artery	xxx	xxx	Pain, swelling, sensory deficit, vascular deficit	Angiography	3 years	Open	(Partial) claviclectomy	Full recovery
Dziak et al	1970	xxx	xxx	xxx	Occlusion of subclavian artery	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Natali et al	1975	10 cases	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Vashenko et al	1980	xxx	xxx	xxx	Acute thrombosis of subclavian artery	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Lorentzen et al	1982	xxx	xxx	xxx	Aneurysm	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Shih et al	1983	xxx	xxx	xxx	Pseudoaneurysm	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Lim et al	1987	56	M	Motorcycle accident	Thrombosis subclavian vein	Midshaft	Rib fractures, scapular fracture	Pain, swelling, vascular deficit	Angiography	Conservative	IV heparin, anticoagulant	Conservative	Full recovery
Koss et al	1989	xxx	xxx	xxx	Compression of subclavian vein	xxx	xxx	xxx	xxx	None	Open	Plate and screws	Full recovery
Giordanengo	1996	25	F	Motorcycle accident	occlusion subclavian artery	xxx	xxx	Pain, vascular deficit	Angiography	None	Endovascular	K-wires	xxx
Coulier et al	1996	xxx	xxx	xxx	Pseudoaneurysm	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Kendall et al	2000	29	M	Fall	Transection of subclavian artery	Midshaft	Hematopneumothorax, death	Death	X-ray	None	xxx	xxx	Death
Serrano et al	2003	60	F	Fall	Pseudoaneurysm	Midshaft	xxx	Swelling	xxx	2 months	Open	Plate and screws	Full recovery
Renger et al	2003	60	F	Fall	Pseudoaneurysm	Midshaft	xxx	Pain, vascular deficit	Duplex sonography, CT angiography	5 months	Endovascular	Plate and screws	Full recovery
Mandal et al	2004	55	M	Motorcycle accident	Pseudoaneurysm	xxx	xxx	Pain, vascular deficit	X-ray, MRI	3 years	Hybrid	Plate and screws	xxx
Watanabe et al	2005	72	M	Fall	Pseudoaneurysm	Midshaft simple	Brachial plexus injury	Pain, swelling, sensory deficit, motor deficit, vascular deficit	CT angiography, MRI	Conservative	Open	Conservative	Full recovery
Stokkeland et al	2007	80	M	Fall	Pseudoaneurysm	Midshaft	Rib fractures, distal humeral fracture, acromioclavicular dislocation	Swelling	CT angiography	5 weeks	Endovascular	Conservative	Full recovery
Sodhi et al	2007	20	M	Motorcycle accident	Occlusion of subclavian artery	Midshaft	Rib fractures, hematopneumothorax	Pain	Angiography	None	Open	Conservative	Full recovery
Kochhar et al	2008	xxx	xxx	xxx	Thrombosis subclavian vein	xxx	xxx	xxx	xxx	11 days	xxx	xxx	xxx
Derom et al	2008	93	M	Fall	Pseudoaneurysm	xxx	Brachial plexus injury	Pain, sensory deficit, motor deficit	CT	None	Endovascular	Conservative	Full recovery
Raviraja et al	2008	22	M	Motorcycle accident	Thrombosis and laceration subclavian vein	Midshaft simple	xxx	Vascular deficit	CT angiography	None	Open	Plate and screws	Full recovery
Wright et al	2009	42	F	xxx	Thrombosis subclavian vein	xxx	xxx	Pain, swelling, vascular deficit	CT angiography	5 weeks	IV heparin, anticoagulant	(Partial) claviclectomy	Full recovery
Murphy et al	2009	26	M	Alteration with a bull	acute aortic transection just distal to the takeoff of the left subclavian artery	xxx	Rib fractures	Pain, swelling	CT angiography	None	Endovascular	Conservative	Full recovery
Cooney et al	2010	21	M	Fall	Compression and laceration of the subclavian vein	Midshaft	xxx	Pain, swelling	Duplex sonography, CT angiography	Conservative	xxx	Conservative	Full recovery
Rodriguez-Merchan et al	2010	46	M	xxx	Pseudoaneurysm	Midshaft	xxx	Swelling	Angiography	3 months	Hybrid	Plate and screws	Full recovery
Claes et al	2010	20	M	Motorcycle accident	Thrombosis of the axillary and the subclavian vein	Midshaft simple	xxx	Pain, swelling, vascular deficit	Angiography, duplex sonography	2 weeks	IV heparin, anticoagulant	Conservative	Full recovery
Stefanczyk et al	2010	10	F	xxx	Pseudoaneurysm	Lateral third	Brachial plexus injury	Pain, swelling, sensory deficit, motor deficit, vascular deficit	Duplex sonography, CT angiography	4 weeks	Endovascular	Conservative	Full recovery
Fatimi et al	2010	20	M	Road traffic accident	Acute traumatic subclavian artery thrombosis	Midshaft	Rib fractures, distal humeral fracture, facial fractures	Pain, vascular deficit	Duplex sonography, CT angiography	None	Hybrid	Conservative	Full recovery
Tachtsi et al	2011	67	F	Road traffic accident	Aneurysm	Midshaft simple	xxx	Pain, vascular deficit	X-ray, angiography	None	Open	Conservative	Full recovery
Peivandi et al	2011	25	M	Sports accident	Thrombosis of subclavian vein	Midshaft simple	xxx	Pain, swelling	Duplex sonography	1 week	IV heparin, anticoagulant	Conservative	Full recovery
Faisham et al	2011	19	M	Motorcycle accident	Compression and laceration of the subclavian vein	Medial third	Brachial plexus injury, hematopneumothorax, femoral fracture, facial fractures, lung laceration and contusion	Vascular deficit	Angiography	None	Open	K-wires	Full recovery
Gullo et al	2012	53	M	Fall	Pseudoaneurysm	Lateral third	xxx	xxx	Duplex sonography, CT angiography	3 weeks	Endovascular	Conservative	Full recovery
Coughlin	2013	39	M	xxx	Thrombosis of axillary, brachial, subclavian vein	xxx	xxx	Pain, swelling, vascular deficit	xxx	None	Open	(Partial) claviclectomy	xxx



Authors	Year	Age	Gender	Trauma	Vascular lesion	Clavicle fracture type	Additional injuries	Symptoms	Imaging	Delay before surgical repair	Treatment vascular	Treatment orthopedic	Outcome
Gill et al	2013	13	M	Sports accident	Compression of subclavian artery	Midshaft simple	Brachial plexus injury	Vascular deficit	CT angiography, MRI	None	Open	Plate and screws	Full recovery
Wong et al	2014	59	F	Fall	Thrombosis subclavian vein	Midshaft	xxx	Swelling, vascular deficit	xxx	20 years	Endovascular	Plate and screws	Full recovery
Hassan et al	2014	67	M	Motorcycle accident	Compression subclavian artery and embolic obstruction of the brachial artery.	Midshaft simple	Rib fractures	Vascular deficit	Duplex sonography, CT angiography	3 years	Open	(Partial) claviculectomy	Full recovery
Ghulam et al	2014	79	F	xxx	Pseudoaneurysm	Midshaft	xxx	Swelling	CT angiography	9 years	Endovascular	Conservative	xxx
Nakada et al	2014	41	M	Road traffic accident	Segmental dissection of the distal subclavian artery with an intimal flap and a compressed true lumen by a thrombus of the pseudo lumen in the distal subclavian artery	Open midshaft	Hematopneumothorax	Sensory deficit, vascular deficit	Angiography, duplex sonography	None	Endovascular	K-wires	Full recovery
Nishimura et al.	2015	70	M	Fall	Pseudoaneurysm	Midshaft simple	xxx	Swelling	CT	Conservative	Endovascular	Conservative	Full recovery
Ranke et al	2015	16	M	Sports accident	Thrombosis of subclavian vein	Midshaft simple	xxx	Pain, swelling	Duplex sonography, MRI-angiography	1 week	IV heparin, anticoagulant	Conservative	Full recovery
Terra et al	2015	70	F	Fall	Thrombosis of subclavian vein	Midshaft simple	xxx	Pain, swelling, vascular deficit	Duplex sonography	2,5 months	IV heparin, anticoagulant	Plate and screws	Full recovery
Stella et al	2015	74	F	xxx	Thrombosis and compression of subclavian artery	Midshaft	xxx	Vascular deficit	CT	30 years	Endovascular	Plate and screws	Full recovery
Evans et al	2015	15	M	Sports accident	Pseudoaneurysm	Midshaft simple	xxx	Sensory deficit, motor deficit, vascular deficit	Duplex sonography	3 months	Open	xxx	Full recovery
Van Schaik et al	2015	52	M	Road traffic accident	Acute subclavian artery occlusion superimposed on a brachial artery stenosis	Midshaft	xxx	Vascular deficit	Duplex sonography, CT angiography	5 years	Open	Conservative	xxx
Campfield et al	2016	64	F	Fall	Small laceration (<1cm) of subclavian artery	Midshaft	xxx	Pain, swelling	X-ray, CT	None	Open	(Partial) claviculectomy	xxx
Mirza et al	2018	83	F	Fall	Pseudoaneurysm	Lateral third	xxx	Pain, swelling, vascular deficit	CT angiography	None	Endovascular	Plate and screws	Full recovery
Conant et al	2018	51	M	Motorcycle accident	2 apparent AV fistulas between the subclavian artery and the subclavian vein	Medial third	Transfusion requiring anemia	Sensory deficit, motor deficit	Duplex sonography, CT angiography	1 year	xxx	xxx	Full recovery
Jaiswal et al	2018	74	M	Fall	Pseudoaneurysm	Midshaft simple	xxx	Pain, swelling	CT angiography	2 weeks	Open	Plate and screws	Full recovery
Miyamoto et al	2018	44	F	Fall	Occlusion of subclavian artery	Midshaft simple	xxx	Pain, sensory deficit, motor deficit, vascular deficit	Duplex sonography, MRI-angiography	9 months	Hybrid	(Partial) claviculectomy	Full recovery
Pallet et al	2018	28	M	xxx	Aneurysm	Midshaft	xxx	Sensory deficit, motor deficit, vascular deficit	Duplex sonography, CT angiography	5 years	Open	xxx	Full recovery
Buchanan et al	2018	73	M	Fall	occlusion subclavian artery	Midshaft comminuted	Rib fractures	Pain, sensory deficit, motor deficit, vascular deficit	CT angiography	None	Open	Conservative	Full recovery
Demir et al	2019	44	M	Sports accident	Occlusion subclavian artery	Midshaft fragmentary wedge	xxx	Pain, sensory deficit, motor deficit, vascular deficit	Duplex sonography, CT angiography	None	Open	Plate and screws	Full recovery
Tsuto et al	2019	66	F	Fall	Pseudoaneurysm	Midshaft simple	Brachial plexus injury	Sensory deficit, motor deficit	CT angiography	None	Endovascular	xxx	Full recovery
Nicholson et al	2019	34	M	Motorcycle accident	Compression and occlusion subclavian artery	Midshaft simple	xxx	Pain, swelling, vascular deficit	CT angiography	3 years	xxx	Plate and screws	Full recovery
Nicholson et al	2019	68	F	Fall	Compression and occlusion subclavian artery	Midshaft simple	xxx	Sensory deficit, motor deficit, vascular deficit	Duplex sonography	5 months	xxx	Plate and screws	Full recovery
Biz et al	2019	88	M	Fall	Pseudoaneurysm	Midshaft	xxx	Pain, swelling	CT angiography	8 weeks	Endovascular	Plate and screws	Full recovery
Makida et al	2019	80	F	Motorcycle accident	Pseudoaneurysm	Midshaft	Brachial plexus injury	Pain, sensory deficit, motor deficit	xxx	9 days	Hybrid	xxx	xxx
Malekpour et al	2020	60	F	xxx	Pseudoaneurysm	Midshaft	xxx	Pain, swelling, sensory deficit, vascular deficit	Duplex sonography, CT angiography	4 years	Hybrid	(Partial) claviculectomy	Full recovery
Belmir et al	2020	40	M	Road traffic accident	Pseudoaneurysm	Midshaft comminuted	xxx	Pain, swelling	Duplex sonography, CT angiography	None	Open	Plate and screws	Full recovery
Lyons	2021	12	F	Fall	Thrombosis subclavian artery	Midshaft	xxx	Pain, swelling, vascular deficit	Duplex sonography, CT angiography	Conservative	xxx	Conservative	Full recovery
Arnold et al	2021	46	M	Motorcycle accident	Laceration subclavian artery	Midshaft fragmentary wedge	Rib fractures	Pain, swelling, vascular deficit	CT angiography	None	Endovascular	Plate and screws	Full recovery
Verdian et al	2021	xxx	M	Forklift crush trauma	Occlusion/thrombosis of subclavian artery	Midshaft simple	Rib fractures, hematopneumothorax, scapular fracture	Pain, swelling	CT	None	Open	Plate and screws	Full recovery
Khalil et al	2021	14	M	Sports accident	Transection subclavian artery	Medial third	Brachiocephalic artery aneurysm	Pain, swelling, vascular deficit	CT angiography	None	Open	K-wires	Full recovery
Tang et al	2022	61	M	Motorcycle accident	Laceration subclavian artery and vein	Midshaft	Rib fractures, scapular fracture, lung laceration and contusion	Pain	CT angiography	None	Open	Plate and screws	Full recovery
Lawson et al	2023	32	F	xxx	Pseudoaneurysm	Midshaft	xxx	Swelling	xxx	16 years	Endovascular	Plate and screws	Full recovery
Ashraf et al	2023	74	M	Road traffic accident	Pseudoaneurysm	xxx	xxx	Pain, swelling, sensory deficit, motor deficit, vascular deficit	CT angiography	2 years	Hybrid	Conservative	Full recovery
Cogburn et al	2023	22	F	xxx	Pseudoaneurysm	Midshaft comminuted	xxx	Swelling	Duplex sonography, CT angiography	4 years	Endovascular	Plate and screws	Full recovery



## Conclusion

Healthcare workers that are involved in the treatment of clavicle fractures must be aware that these can be associated with a lesion of the subclavian artery. Clinical symptoms can be subtle, and in case of doubt, computed tomography angiography is advised to make a correct diagnosis. An open surgical approach for these combined lesions has several advantages: The clavicle fracture provides a window to the subclavian artery for repair. Surgical stabilization of the fracture with plate and screws prevents inadvertent motion or compression of the fracture fragments on the vascular repair and allows early mobilization.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

**Conflict of interest:** Nil **Source of support:** None

Plate designs for anteroinferior placement on the clavicle have a lower chance of iatrogenic laceration of the vascular repair. According to the literature, a good outcome in our case can be expected.

## Clinical Message

Clinicians should maintain a high index of suspicion for subclavian artery injury in patients with clavicle fractures, especially when vascular signs are subtle, as early diagnosis and combined surgical management of both the fracture and vascular lesion are crucial for optimal outcomes.

## References

1. Sinha A, Edwin J, Sreeharsha B, Bhalaik V, Brownson P. A radiological study to define safe zones for drilling during plating of clavicle fractures. *J Bone Joint Surg Br* 2011;93-B:1247-52.
2. Tay E, Grigorian A, Schubl SD, Lekawa M, De Virgilio C, Scolaro J, et al. Brachial plexus injury significantly increases risk of axillosubclavian vessel injury in blunt trauma patients with clavicle fractures. *Am Surg* 2021;87:747-52.
3. Hyre CE, Cikrit DF, Lalka SG, Sawchuk AP, Dalsing MC. Aggressive management of vascular injuries of the thoracic outlet. *J Vasc*
4. Erichsen J. Clinical lecture on a case of comminuted fracture of the clavicle, with compression of the subclavian vein by one of the fragments. *Br Med J* 1873;1:637-8
5. Xenos ES, Freeman M, Stevens S, Cassada D, Pacanowski J, Goldman M. Covered stents for injuries of subclavian and axillary arteries. *J Vasc Surg* 2003;38:451-4.
6. Castelli P, Caronno R, Piffaretti G, Tozzi M, Laganà D, Carrafiello G. Endovascular repair of traumatic injuries of the subclavian and axillary arteries. *Injury* 2005;36:778-82.
7. Wang KQ, Wang ZG, Yang BZ, Yuan C, Zhang WD, Yuan B, et al. Long-term results of endovascular therapy for proximal subclavian arterial obstructive lesions. *Chin Med J (Engl)* 2010;123:45-50.
8. Higashimori A, Morioka N, Shiotani S, Fujihara M, Fukuda K, Yokoi Y. Long-term results of primary stenting for subclavian artery disease. *Catheter Cardiovasc Interv* 2013;82:696-700.
9. Körner M, Baumgartner I, Do DD, Mahler F, Schroth G. PTA of the subclavian and innominate arteries: Long-term results. *Vasa* 1999;28:117-22.
10. Nakada TA, Idoguchi K, Fukuma H, Ono H, Nakao S, Matsuoka T. Case report: Urgent endovascular treatment of subclavian artery injury after blunt trauma. *F1000Res* 2014;3:310.
11. Tadayon N, Yavari N, Zarrintan S, Hosseini SM, Kalantar-Motamedi SM. Management of traumatic subclavian artery injuries in a high-volume vascular surgery center in Iran. *J Cardiovasc Thorac Res* 2020;12:145-9.
12. Bentley TP, Hosseinzadeh S. Clavicle Fractures. In: *StatPearls Treasure Island, FL: StatPearls Publishing; 2024.*
13. Wolf S, Chitnis AS, Manoranjith A, Vanderkarr M, Plaza JQ, Gador LV, et al. Surgical treatment, complications, reoperations, and healthcare costs among patients with clavicle fracture in England. *BMC Musculoskelet Disord* 2022;23:135.
14. Hoogervorst P, Van Schie P, Van Den Bekerom MP. Midshaft clavicle fractures: Current concepts. *EFORT Open Rev* 2018;3:374-80.
15. Paladini P, Pellegrini A, Merolla G, Campi F, Porcellini G. Treatment of clavicle fractures. *Transl Med UniSa* 2012;2:47-58.
16. Song HS, Kim H. Current concepts in the treatment of midshaft clavicle fractures in adults. *Clin Shoulder Elb* 2021;24:189-98.

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