



E-ISSN: 2395-1958  
P-ISSN: 2706-6630  
IJOS 2019; 5(4): 267-269  
© 2019 IJOS  
www.orthopaper.com  
Received: 16-08-2019  
Accepted: 18-09-2019

**Dr. Prashant Madan Mohan**  
Consultant Orthopedics  
Chettinad Academy of Research  
and Education, Kelambakkam,  
Tamil Nadu, India

**Dr. Arun Kumar KV**  
Assistant Professor, Orthopedics  
Chettinad Academy of Research  
and Education, Kelambakkam,  
Tamil Nadu, India

**Dr. Victor Moirangthem**  
Professor Orthopedics Chettinad  
Academy of Research and  
Education, Kelambakkam,  
Tamil Nadu, India

**Dr. Prem Regis PA**  
Post-Graduate Orthopaedics  
Chettinad Academy of Research  
and Education, Kelambakkam,  
Tamil Nadu, India

**Dr. Ashwini R**  
Post-Graduate Orthopedics  
Chettinad Academy of Research  
and Education, Kelambakkam,  
Tamil Nadu, India

**Corresponding Author:**  
**Dr. Arun Kumar KV**  
Assistant Professor, Orthopedics  
Chettinad Academy of Research  
and Education, Kelambakkam,  
Tamil Nadu, India

## Subclavian artery thrombosis following plate osteosynthesis of fracture clavicle: A case report with literature review

**Dr. Prashant Madan Mohan, Dr. Arun Kumar KV, Dr. Victor Moirangthem, Dr. Prem Regis PA and Dr. Ashwini R**

DOI: <https://doi.org/10.22271/ortho.2019.v5.i4e.1681>

### Abstract

Thrombosis in the upper limbs is a rare condition. We report on a case of subclavian artery thrombosis that occurred following open reduction and internal fixation of fracture in the middle third of the left clavicle. This is difficult to diagnose and requires a high index of suspicion. Early recognition can prevent fatal thromboembolic complications and disability.

**Keywords:** Subclavian artery thrombosis, plate osteosynthesis, fracture clavicle

### Introduction

Clavicle fracture is a common injury, representing 4-10% of all fractures and 44% of injuries involving the upper limb. Neurovascular injuries associated with closed fractures of the clavicle are rare and are associated mainly with penetrating trauma. Subclavian artery thrombosis is a rare condition. There are very few cases in literature. The objective of this case report is to report on this rare condition, which if not diagnosed and corrected early, can lead to limb and life threatening complications.

### Case report

31 year old female patient presented with injury to left clavicle following a RTA. Patient had no history of other injuries, on examination revealed tenderness and crepitus over left clavicular region with no distal neurovascular deficit, X-ray left shoulder showed displaced fracture middle third left clavicle for which open reduction and internal fixation of left clavicle was done under regional block. Post-operatively on day one on examination radial pulse was absent hence subclavian artery thrombosis was suspected and CT-angiography of the left upper limb was done immediately which showed for a length of 3cms occlusion of mid part of left subclavian artery with adjacent soft tissue density noted in infraclavicular fat probably hematoma, On checking with hand held Doppler and pulse was feeble, Patient was started on unfractionated heparin 5000 IU QID with consultation with vascular surgeon and after ruling out coagulopathies, on the second post operative day patient showed major improvement in clinical condition and physical examination showed feeble radial pulse on left side. Patient was discharged on POD-7 with oral Aspirin 75 mg and Cilostazol 50 MG for one month duration. On one month review arterial Doppler study of left upper limb was done for the patient which showed no monophasic flow in brachial, proximal ulnar and radial artery.



Pre-operative X-ray



post-operative X-ray



CT Angiography picture of the patient showing the occlusion in the subclavian artery of about 3cms.

**C T – UPPER LIMB ANGIO (Left)**

*Multislice serial axial sections of left upper limb acquired in helical mode with MIP and volume rendering reconstructions.*

**FINDINGS & IMPRESSION:**

- Post operative status of left clavicle. Implant in situ with adjacent soft tissue stranding and air pockets.
- Mid part of left subclavian artery shows no contrast opacification approximately for a length of 3 cms (occlusion) with adjacent soft tissue density noted in infra clavicular fat probably hematoma.
- Proximal and distal subclavian artery appears normal.
- Axillary artery, brachial artery, ulnar artery and radial artery shows normal calibre and normal contrast opacification.
- Superior ulnar collateral artery is arising from upper third of brachial artery and extending till wrist (Normal variant).

CT Angiography report

**ARTERIAL DOPPLER STUDY OF LEFT UPPER LIMB**

Subclavian, Axillary, Brachial, Radial and Ulnar arteries were imaged in Left upper limb under 2D, color mode and Doppler mode with appropriate transducers.

Vessel	Lumen	Flow Velocity	Spectral
Left Brachial Artery	Normal	Normal	Monophasic
Left Radial Artery	Normal	Normal	Monophasic
Proximal left Ulnar Artery	Normal	Normal	Monophasic

**There is no monophasic flow in brachial proximal ulnar and radial artery. There is no flow in distal ulnar artery.**

One month follow up arterial Doppler of the patient

## Discussion

There are very few reports on this rare condition in the literature. Further rare is resolution of the thrombosis with anticoagulant therapy alone without any vascular surgical intervention. All the more it is a life and limb threatening condition which should be in the mind of every surgeon managing a case of clavicle fracture.

In 2007 Sodhi *et al.* [1] reported a case of a 20 year old man following a RTA with a flail segment in the left upper chest with absent radial pulse and a clavicular fracture on the same side. Thoracic arch aortogram showed a complete occlusion of the proximal left subclavian artery, approximately 2 cm beyond its origin. They performed end to side anastomosis by placing a graft between the left common carotid and left subclavian artery with visible reperfusion of the left upper extremity.

In 2010 Fatimi *et al.* [2] reported a case of acute traumatic subclavian artery thrombosis and its successful repair via resection and end to end anastomosis in a 20 year old man. The patient had multiple facial bone fractures, rib fractures, distal humerus and clavicle fracture on the right side. The radial pulse was absent and patient was taken to surgery primarily to restore the vascularity of the right upper limb. The right clavicle fracture was managed conservatively.

In 2018 Pallet *et al.* [3] reported a case of left subclavian artery aneurysm with radial artery thrombotic sequelae 5 years following plate fixation of the clavicle in a 28 year old man. There no indication of any vascular complications immediately following the surgery.

He presented 5 years following the surgery and his symptoms had deteriorated over a period of 3 months from altered sensation and cold hand to frank absent of radial pulse, when a computed tomography angiogram depicted a left subclavian aneurysm containing thrombus.

Delayed subclavian lesions that have an association with screw-plate fixation of the clavicle have previously been described in the literature in only 5 cases [4, 5].

This example included 50% of available reports describing an initial presentation with ischemic symptoms of the left arm [4, 5].

In the present case, 31 year old female patient presented with injury to left clavicle following RTA. Patient had developed edema and complained of generalized pain in the left arm on the first post operative day. The radial pulse was absent on day one following the surgery. Treatment was carried out in conjunction with the vascular surgeon. The patient was started on unfractionated heparin 5000 IU QID. On the second post operative day patient showed major improvement in clinical condition and physical examination showed feeble radial pulse on left side. Patient was discharged on POD-7 with oral Aspirin 75 mg and cilostazol 50 mg for one month duration. On one month review arterial Doppler study of left upper limb was done for the patient which showed patent lumen and normal flow velocity with no monophasic flow in brachial, proximal ulnar and radial artery.

This is an extremely rare case unreported in literature on an early post operative presentation of subclavian artery thrombosis following ORIF of clavicle with plate in a previously normal upper limb. The positive outcome was due to a strong index of suspicion and early intervention in the form of anticoagulant therapy.

There must be a high level of suspicion to diagnose this uncommon entity, to avoid limb and life threatening complications. Although this entity is rare the possibility of subclavian artery thrombosis should always be considered in

patients with fracture of the clavicle both conservatively managed and operated cases.



6 months follow up X-ray of the patient

## References

1. Fatimi SH, Anees A, Muzaffar M, Hanif HM. Acute traumatic subclavian artery thrombosis and its successful repair via resection and end-to-end anastomosis. *Chin J Traumatol.* 2010; 13(4):255-6.
2. Sodhi KS, Arora J, Khandelwal N. Post-Traumatic Occlusion of Subclavian Artery with Clavicle Fracture. *The Journal of Emergency Medicine.* 2007; 33(4):419-420. doi:10.1016/j.jemermed.2007.02.054
3. Scott John Charles Pallett, Isabelle Singh, Neveen Rady, Hemprakesh Goshai, Delayed Subclavian Artery Aneurysm Following Fixation of a Clavicular Fracture. *Vascular and Endovascular Surgery* 1-4 sagepub.com/journalsPermissions.navDOI:10.1177/1538574418770105journals.sagepub.com/home/ves
4. Johnson B, Thursby P. Subclavian artery injury caused by a screw in a clavicular compression plate. *Cardiovasc Surg.* 1996; 4(3):414-415.
5. Coulier B, Mairy Y, Etienne PY, Joris JP. Late diagnosis of a traumatic pseudo-aneurysm of the subclavian artery. *J Belge Radiol.* 1996; 79(1):26-28.