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Brachial Plexopathy After Clavicle Fracture Surgery

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BACKGROUND AND OBJECTIVES

- Clavicle fractures account for around 4% of all fractures, with the middle third being the most common point of fracture.
- Nondisplaced clavicle fractures can be treated with conservative management such as immobilization with a sling, pain medications, and physical therapy.
- More complicated fractures such as displaced fractures, open fractures, and fractures with concomitant neurovascular injuries often require surgical intervention.
- General anesthesia (+/- regional nerve blocks) are the primary method of anesthesia for open reduction and internal fixation (ORIF) of the clavicle.
- The association between clavicle fractures and brachial plexus injury is rare but well recognized.
- Injury to the brachial plexus could occur at the time of the fracture, as a late finding from complications of the fracture, from the surgical fixation, or from a regional block of the brachial plexus.
- The purpose of this study is to report a rare cause of brachial plexopathy after clavicle surgery and to discuss the diagnosis and management of brachial plexus injuries.

METHODS

We present the case of a patient with a clavicle fracture who underwent surgical fixation with combined regional and general anesthesia and was found to have a brachial plexus injury.

CASE PRESENTATION

- 56 year old male with PMH of hypertension was diagnosed with a minimally displaced right clavicular fracture after an ATV rollover accident.
- Upon initial evaluation in the hospital, orthopedics recommended conservative management and outpatient follow up.
- At two week follow up, Orthopedics recommending right clavicle ORIF given continued pain at site and X-ray showing worsening of the deformity
- Preoperatively, patient underwent an ultrasound-guided interscalene brachial plexus block as well as a superficial cervical plexus block. The needle was visualized throughout the entire procedure, and no pain was noted on injection.
- Surgery was uneventful, and the patient was discharged home the same day from PACU with adequate pain control from the block.
- At the two week postoperative follow up, patient was found to have significant secondary and motor deficits in his right upper extremity (RUE), including inability to flex/extend at the elbow and wrist.
- Orthopedics consulted plastic surgery and neurosurgery, who obtained RUE electromyography (EMG), which showed significant RUE nerve dysfunction in multiple nerves/root distributions. MRI of the brachial plexus was also obtained, which showed **deep vein thrombosis (DVT) of right subclavian and proximal right axillary vein with surrounding edema as well as nonspecific edema around the right brachial plexus.**
- After vascular surgery referral, the patient was started on apixiban and scheduled for a venogram and thrombectomy. **Two weeks after starting eliquis, patient reported significant improvement in symptoms** and RUE venogram showed resolution of DVT in both locations.
- Patient's motor function fully recovered after 4 months of physical therapy.

DISCUSSION AND CONCLUSION

- Brachial plexus injury following clavicle fracture fixation is rare, with reported incidences of approximately 0–1.5%.
- Mechanisms include traction during surgical reduction, compression from fracture fragments or callus, postoperative hematoma, and less commonly vascular causes such as upper extremity DVT leading to plexus compression.
- Diagnosis of brachial plexus injury involves clinical recognition of postoperative neurologic deficits involving multiple upper extremity nerve distributions, followed by electrodiagnostic studies (EMG) and imaging such as MRI to evaluate brachial plexus pathology, with vascular imaging when thrombotic or compressive vascular causes are suspected; treatment depends on the underlying etiology and may include anticoagulation, thrombectomy, surgical decompression, and supportive rehabilitation.
- This is the only known case of brachial plexopathy following clavicle fracture and fixation secondary to upper extremity DVT.
- Early multidisciplinary collaboration among anesthesia, orthopedic surgery, neurology, and vascular surgery was essential for prompt diagnosis and targeted management, highlighting the importance of teamwork in identifying uncommon causes of postoperative neurologic deficits.
- Although rare, upper extremity DVT should be considered among the differential diagnoses for brachial plexopathy after clavicle fracture surgery.

REFERENCES & ACKNOWLEDGMENTS

1. Ju YW, Kim SH, Kim BJ. Brachial plexopathy due to upper-extremity deep vein thrombosis: a case report. J Electrodiagn Neuromuscul Dis. 2022;24(1):28-31. doi:10.18214/jend.2021.00115
2. Serpico M, Tomberg S. The emergency medicine management of clavicle fractures. *Am J Emerg Med*. 2021;49:315-325. doi:10.1016/j.ajem.2021.06.011
3. Saito T, Matusmura T, Takeshita K. Brachial plexus palsy after clavicle fracture: 3 cases. *J Shoulder Elbow Surg*. 2020;29(2):e60-e65. doi:10.1016/j.jse.2019.09.027