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Ipsilateral sternoclavicular joint anterior dislocation with fracture of the mid shaft of the clavicle

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ABSTRACT

Even though fractures of the clavicle are very common but fracture of the shaft of clavicle associated with sternoclavicular joint dislocation is extremely rare. This is a case report of a 50-year old woman who met with a road accident. Radiographs revealed right mid shaft clavicle fracture with inferior angulation of fracture fragments, anterior dislocation of sternoclavicular joint. The sternoclavicular joint was stabilized with sutures whereas the midshaft fracture was managed non-operatively. In postoperative period the sternoclavicular joint was found stable whereas the shaft clavicle united completely after 6 months.

1. Introduction

Clavicle fractures constitute around 3% of all fractures.[1] Sternoclavicular disruptions are rarely seen.[2] These result from a high energy trauma and are generally associated with thoracic injury. The anterior and posterior dislocation depends upon the displacement of the medial clavicle end over the sternum.[3] Anterior dislocations are more common and posterior dislocations are often fatal and missed. Posterior dislocation is fatal as it may injure the neurovascular structures, oesophagus and trachea or may lead to haemothorax or pneumothorax.[4] Rapid investigations and a good clinical suspicion may lead to an early diagnosis and further management.

In the extensive search of literature we were unable to find such a case report so here is a rare case report of a woman who had anterior sternoclavicular dislocation with ipsilateral midshaft clavicle fracture.

2. Case report

A 50-year old woman met with a road accident while travelling in a car. She was sitting on a rear seat without seat belt, driver lost control and vehicle turned over three times. She was taken to local hospital for first aid and then transferred to our hospital. She had pain over right shoulder, right side of chest, back, abdomen and superficial abrasions over elbows, forehead & shoulders. Swelling and tenderness was present over right clavicle, right sternoclavicular joint, right side ribs and lower dorsal spine. Medial end of right clavicle was dislocated antero -medially and was unstable.

Radiographs revealed right mid shaft clavicle fracture with inferior angulation of fracture fragments, anterior dislocation of sternoclavicular joint (Fig. 1) & Grade one compression fracture of D12. Ultrasonography of chest & Abdomen showed right side haemothorax (200 cc) and a small right renal subcapsular hematoma. CT Scan confirmed anterior dislocation of sternoclavicular joint (Fig. 2) and also revealed undisplaced fractures of right side first & second ribs at costochondral junction. Routine Blood Investigations were with - in normal limits. Repeat USG done after 48 hours showed no further increase in haemothorax. Clavicle mid shaft fracture was stable with inferior angulation but medial end of right clavicle was grossly unstable, so on third day, open reduction & stabilization of right sternoclavicular joint was performed under GA.

2.1. Surgical technique

Joint was approached via a 5cm transverse incision along the long axis of the clavicle extending up to anterior midline of manubrium. Medial end of clavicle was lying just under the superficial fascia with ruptured anterior capsule, interclavicular ligament & costoclavicular ligament. Upper one third of Intraarticular fibrocartilaginous disc (meniscus) was torn and folded in to the joint

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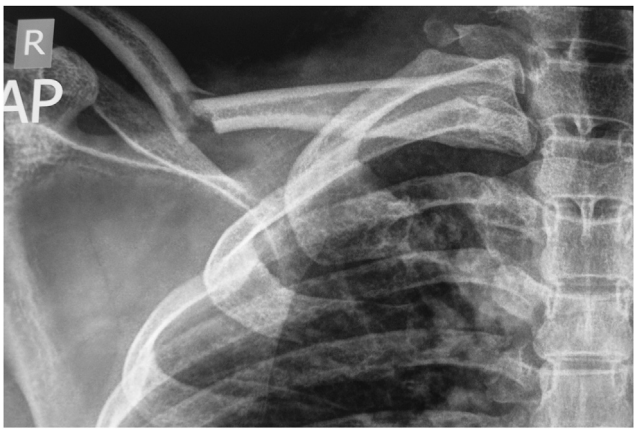

Fig. 1. Pre-op X-ray image showing ipsilateral shaft clavicle with sterno-clavicular joint dislocation.

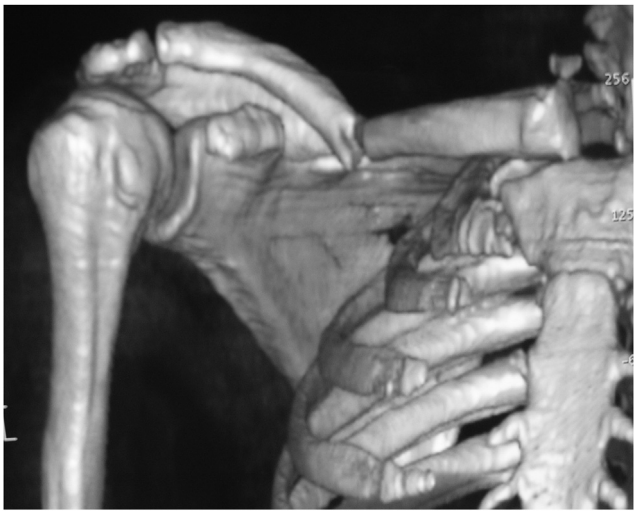

Fig. 2. Pre-op CT-Scan image showing ipsilateral shaft clavicle with sterno-clavicular joint dislocation.

which was obstructing relocation. Joint hematoma was washed and torn fibrocartilaginous disc fragment was excised. For repair surgical technique was followed as described by Thomas et al.[5] With a 2.5mm drill bit, 2 holes were made in the same sagittal plane in the clavicle 5 mm from its medial end. The drill holes breached only the outer cortex of the clavicle. Two further 2.5 mm holes were drilled into the medulla of the clavicle from the joint side in order to communicate with the initial holes. The same procedure was carried out 5 mm from the articular margin on the manubrium (Fig. 3). The inner cortex of the manubrium was not breached. With all drill holes made, non-absorbable (polyester-05) sutures were double-looped between the medial clavicle and manubrium and tied under tension. Joint was reduced completely; ends of torn costoclavicular ligament were repaired with polyester - 02, and anterior Joint capsule with polyglactin −1 suture. Mid shaft clavicle fracture was stable and was not operated (Figs. 4 and 5).

2.2. Post operatively

A compression dressing was applied to the surgical wound. A shoulder immobilizer was applied for 4weeks followed by gradual active shoulder rotation. Elevation and abduction exercises were started after 6 weeks. Full activities were resumed at 8 weeks. At 12 weeks, Patient was symptom free with full range of shoulder movement and X-ray was showing stable SCJ and uniting mid shaft clavicle fracture. At 6 months, clavicle fracture was consolidated with angulation and SCJ was stable (Fig. 6).

3. Discussion

This was an extremely rare case of ipsilateral clavicle shaft and sternoclavicular joint dislocation. On a detailed review of literature there was no case report found and hence, an evidence based treatment could not be done.

The fracture was fixed after 48 hours of injury when the patient was stabilized. Midshaft clavicle fractures are very common and there are specific indications for surgery. These include risk to the mediastinal structures due to fracture displacement, soft tissue compromise or other associated injuries leading to floating shoulder.[6] In this case report the fracture was not displaced but there was angulation and hence, the decision to manage the clavicle shaft fracture conservatively was taken.

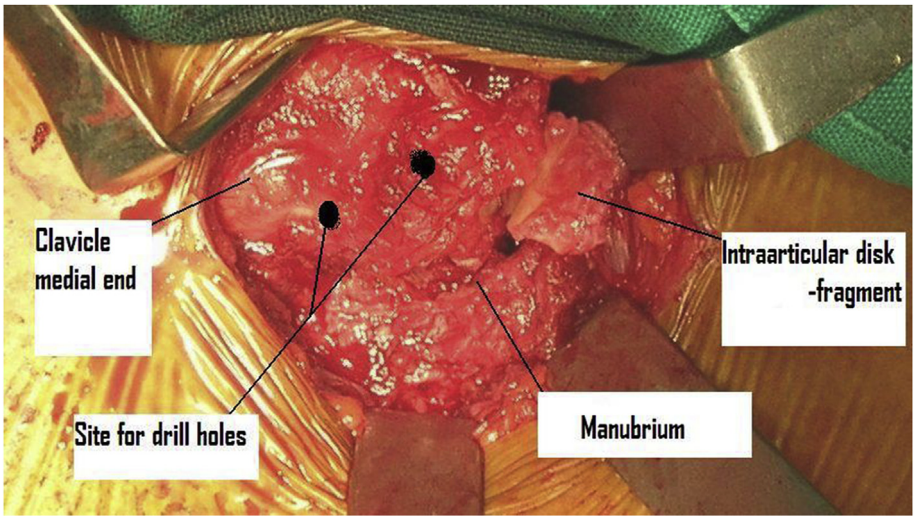

Fig. 3. Intra-op pics of location for drilling of holes in the sternum and clavicle.

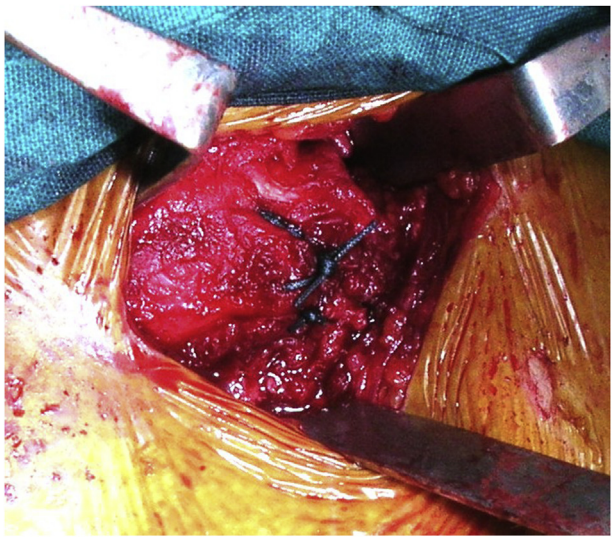

Fig. 4. Intra-op pic showing the final reduction of the sternoclavicular joint after tightening of Ethibond.

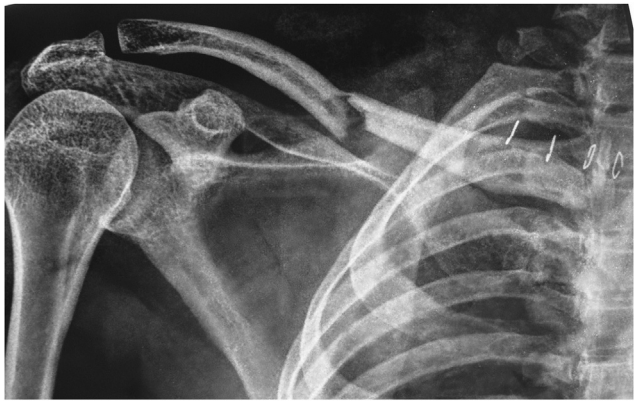

Fig. 5. Immediate postop Xray image.

Due to its rarity, the mode of treatment of sternoclavicular joint dislocation is still debatable. Generally the anterior dislocations are managed conservatively as it is not a fatal condition. However, in unstable dislocations of the sternoclavicular joint operative treatment may be preferred.[3] In this case report the combination of the dislocation along with midshaft fracture was making the

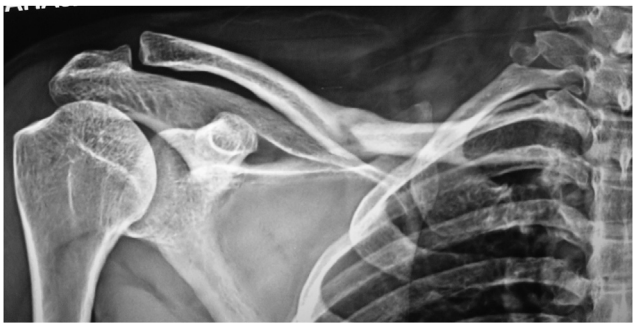

Fig. 6. 6 months old postop Xray image.

dislocation really unstable and hence, the decision was taken to stabilize the dislocation by surgical method. Various treatment options include tenodesis of subclavius[7] and sternomastoid muscle,[8] use of suture anchor,[9] plating,[10] k-wire,[11] braided polyethylene mesh devise (surgilig lockdown).[12] In this case the technique of Thomas et al. using polyester was used following which the fracture seemed to be reduced and stabilized and hence, no further procedure was done.

The fracture and dislocation both could not have been left unoperated because this injury mimicked floating clavicle injury[13] and was extremely unstable. Another thought process would have been fixation of the fracture clavicle without operating the dislocation, which may have stabilized sternoclavicular joint. However, it seemed less likely.

Thomas CB[14] et al. and Tanlin Y[15] have managed a similar case with the help of operating procedure for the shaft clavicle as without stabilizing the fracture site the sternoclavicular joint couldn't be manipulated and reduced. This was due to the medial fragment of the fracture floating and being difficult to reduce. Pearsall AW et al.[16] went for a non-operative approach for both the fracture and dislocation as the case was associated with long thoracic nerve injury and came out with good outcome. Khalid N et al.[17] did ORIF with plating on the fracture site and on opening the sternoclavicular joint it was seen that the articular disc was damaged and was not becoming stable and hence, SC joint fusion was done which resulted in restriction of abduction. In the current study the SC joint was repaired whereas the fracture of midshaft clavicle was left unoperated as it was not essential to fix. Hence, it might be said that these fractures do require stabilization of either the fracture or the SC joint. These studies have been tabulated in Table 1 for comparison.

This case report gives an insight on the probable management

Table 1
Comparison of the current study outcome with similar studies found in literature.

Study	Shaft Clavicle Management	Sternoclavicular Joint Management	Outcome	Complications
Thomas CB et al.[14]	ORIF	Closed Reduction	Good	None
Tanlin Y et al.[15]	ORIF with K-wires and SS wires	Capsule repaired.	Good. Patient had complete recovery of shoulder function.	None
Pearsall AW et al.[16]	Bracing	Medication	Good. Patient was able to return to his preinjury functional state in 6 months.	Traumatic Long thoracic nerve injury which healed during the course of treatment. Angulation at fracture site Limitation of rotations, abduction and adduction.
Khalid N et al.[17]	ORIF with plating	Open reduction and Fusion.	Good. Fracture united and patient asymptomatic.	Limitation of Abduction.
Present Study	Bracing	Open reduction held with sutures and repair	Good. Patient was able to return to his preinjury functional state in 6 months.	Angulation at fracture site

technique of such a rare fracture dislocation configuration. Some case reports close to the above fracture dislocation configuration included medial end fracture dislocation of clavicle,[3] which was managed by clavicle shaft plating, floating clavicles,[13] posterior dislocation with clavicle shaft fracture which was managed by open reduction and stabilization of both the fracture and dislocation of the clavicle and sternoclavicular joint.[2]

4. Conclusion

This case report of successful management of sternoclavicular dislocation with ipsilateral clavicle shaft fracture gives a probable method of management of such a rare injury. However, further studies with different ways and means to manage such cases can be helpful in establishing an evidence based method of treatment of such injuries.

Conflicts of interest

There is no conflict of interest.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jcot.2018.08.002.

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