Innovations

Planning Physiotherapy Rehabilitation for Patient with Acromio Clavicular Joint Dislocation: A Case Report

Dr. Noel Samuel Macwan [1*], Dr. Shakshi Devendra Patel [2]

[1]Assistant Professor, College of Physiotherapy, Sumandeep Vidyapeeth deemed to be University, Piparia, Waghodia, Vadodara, Gujarat, India

[2] 1st year MPT Student (2023-2024), College of Physiotherapy, Sumandeep Vidyapeeth deemed to be University, Piparia, Waghodia, Vadodara, Gujarat, India

Corresponding Author: **Dr. Noel Samuel Macwan**

Abstract

Background: The acromioclavicular (AC) joint is a flat one. Among the different prevalent shoulder issues, acromioclavicular (AC) joint dislocation accounts for 9%–12% of all shoulder injuries. Trauma that is both direct and indirect can cause dislocations of the AC joint. An inferiorly directed, vertically orientated superior impact on the lateral shoulder causes direct trauma by pushing the AC joint in that direction. The acromioclavicular ligament is injured in an AC dislocation, and the coracoclavicular ligament may or may not tear. Case report: In this case report, a 50 years old male farmer by occupation with traumatic history treated conservatively initially and later underwent surgery in form of AC joint reconstruction with k wire fixation and ipsilateral palmaris longus graft and patient shoulder. The patient underwent implant removal after 5 weeks and was referred to the Physiotherapy OPD. The orthopaedic assessment of the patient showed impaired right shoulder joint mobility and integrity, impaired muscular performance leading to difficulty in activities of daily living. Conclusion: The case report presented is, to the best our knowledge, the seventh case described in the literature that was managed operatively and role of physiotherapy treatment to rehabilitate this subject to the pre injury level have been pointed out for the first time.

keywords: *"Acromio clavicular Joint, Dislocation, Shoulder Movement, reconstruction, activities of daily living"*

1. Introduction:

The acromioclavicular (AC) joint is a flat one. The superior and inferior acromioclavicular ligaments, the strongest of which is the first, strengthen the capsule. The main function of these ligaments is to limit (stabilize) the posterior movement of the clavicle's outer end. Therefore, the coracoclavicular and acromioclavicular ligaments are principally responsible for the stability of the AC joint [1].

Among the different prevalent shoulder issues, acromioclavicular (AC) joint dislocation accounts for 9%–12% of all shoulder injuries [2, 3], especially during contact sports. Trauma that is both direct and indirect can cause dislocations of the AC joint. An inferiorly directed, vertically orientated superior impact on the

lateral shoulder causes direct trauma by pushing the AC joint in that direction [2].The degree of inferior displacement of the clavicle being limited by the robust interlocking ligaments at the sternoclavicular joint. The rupture of the AC and coracoclavicular ligaments can then result from a larger degree of inferior transposition of the acromion [3]. The most common cause of indirect damage is falling on an extended, adducted arm, which drives the humeral head into the joint and the inferior face of the acromion. The force of impact has a direct bearing on how severe this ailment is [2].

The acromioclavicular ligament is injured in an AC dislocation, and the coracoclavicular ligament may or may not tear [1]. The acromioclavicular and coracoclavicular ligaments, which keep the joint in its natural position without displacement, can sprain easily, causing an AC joint dislocation, or it can cause widely displaced injuries, such as dislocations of the distal third of the clavicle after the delta-trapezial fascia [2]. Where there is a rise or reduction in the distance between the acromion and clavicle, the AC Joint is engaged in flexion, extension, and sliding. Nonetheless, rotation along the clavicle's long axis constitutes the primary joint movement. Hyperlaxity has been identified as the primary factor causing these circumstances [1].

2. Case Report

In this case report, a 50 years old male farmer by occupation & right hand dominant, was referred to the Physiotherapy OPD in the last week of January 2024. On Initial inquiry at the reception desk the patient presented himself as a case of right sided shoulder pain. The detailed assessment of the subject was taken. The main complains of the patient were difficulty in doing over head activities with right hand and pain in the right shoulder since fall. Patient had a history of fall from bike around mid October 2023, he directly fell on his right shoulder. There was history of immediate pain and swelling with that he went to local hospital where x-ray was taken (fig 1 a) which showed right shoulder dislocation and was treated conservatively by giving shoulder sling. The patient added that after a week rest he continued farming activities. Patient visited a tertiary care hospital in last week of November 2023 as the pain aggravated and patient found difficulty in doing ADL's. Investigations were done in form of X-ray and blood profile. Here the patient was diagnosed as closed acromioclavicular joint disruption without distal neuro vascular deficit. Surgery was performed in form of AC joint reconstruction with k wire fixation and ipsilateral palmaris longus graft and patient shoulder was immobilised under shoulder arm pouch for two weeks. After 2 weeks time period he had complaint of impingement and in last week of December 2023 surgery was done in form of implant removal and then he was immobilised again for one month. Patient underwent through radiological investigation in form of x-ray post surgery and post removal of implant. (fig 1 b & c)

At the end of January 2024, movement was permitted so the patient got referred to the Physiotherapy OPD. The Incisional scar measured around 9.5cm in length was healed & mobile. The lateral end of the clavicle was prominently seen on viewing from the anterior aspect and lateral aspect. (fig 2 a & b) There was tenderness on the anterior aspect of the right forearm on palpation. The patient had restricted right shoulder ranges. For the right shoulder joint, the shoulder flexion range was 0°-110°, Shoulder extension 0°-27°, Shoulder abduction 0°-95°, shoulder internal rotation 0°-45° shoulder external rotation 0°-37°, scapular ranges were full and free. For the left shoulder joint, all the shoulder ranges were full and pain free. Even the muscle strength for the right shoulder muscles was Grade 5. Altered scapular humeral rhythm was observed for the right shoulder abduction. (fig 2 c) The strength of right side shoulder and scapular muscle was fair compared to left side. Functional assessment was taken in form of Shoulder pain and disability index (SPADI) [4] and score was 68 which showed higher than moderate level of disability.

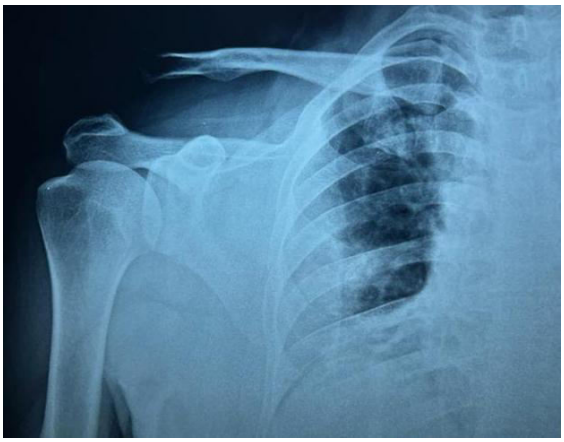

Fig 1.(a)

Fig 1.(b)

Fig 1.(c)

Figure 1:

(a) shows, X-ray AP view of shoulder joint of patient immediate after fall,

(b) shows X-ray Axial view of should joint where AC joint dislocation fixed with K wire fixation and

(c) shows X-ray AP view of shoulder joint with removal of K wire after 5 weeks of surgery

Fig 2.(a)

Fig 2.(b)

Fig 2.(c)

Figure 2:

(a) shows prominent lateral border of clavicle in the Anterior view,

(b) shows prominent lateral border of clavicle in the Lateral view and

(c) shows altered Glenohumeral rhythm for the right shoulder joint

3. Treatment

Tailor made Physiotherapy treatment aimed to relieve pain and tenderness on the anterior aspect of the forearm was adopted from the rehabilitative protocol given by LeVasseur MR et al. [5]. Improving the shoulder ranges, improving the muscle strength shoulder were also aimed for patient. (Refer table 1) The reason for giving the home exercise protocol was that as the patient was living far off from the Physiotherapy centre, cannot visit the centre on the regular basis.

Table 1 shows the tailor made Physiotherapy treatment protocol

Aim & Goal of Treatment	Treatment Given	Parameter
To reduce shoulder Pain & tenderness at anterior aspect of right forearm	Moist heat therapy & Ultrasound therapy	15 mins 3MHz frequency, in continuous mode for 8 minutes
To Improve right side shoulder mobilisation	Wand exercises to improved shoulder flexion, shoulder extension, shoulder abduction, shoulder external rotation, shoulder internal rotation. Other shoulder joint mobilisation exercises were shoulder ladder for improving shoulder abduction and shoulder flexion. Pendular shoulder exercise	Exercises to be done two times/ sessions a day for 5 days in a week with all the exercises repeated 10 times per session.
To Improve muscle strength	Shoulder Isometrics	10 repetitions of 5 sec hold × 2 sets / day for 5 days in a week
To improve Glenohumeral rhythm	Scapular stability exercise	10 repetitions of 5 sec hold × 2 sets / day for 5 days in a week

4. Discussion:

Situated between the medial edge of the scapular acromion process and the lateral end of the clavicle, the AC joint is a diarthrodial joint. Hyaline cartilage first makes up the articular surfaces. Within the joint lies a fibrocartilaginous disk that varies in size and form. All of the motion, which is primarily gliding, is produced by bone movement rather than joint action. 40–50° of rotation is produced by the clavicle, with the remaining 5–8° coming from the AC joint and the scapular rotation. The AC and coracoacromial ligaments stabilize the joint, while the deltoid and trapezius muscles, as well as the glenohumeral joint capsule, also serve as stabilizing elements [3].

Atraumatic AC Joint dislocation is still an extremely uncommon occurrence [6]. In light of the patient's age and the minor complaints that they had reported, nonoperative treatment was advised with a thorough explanation. This included avoiding certain manoeuvres that could cause dislocation, such as active abduction combined with external rotation, as well as postural therapy without the use of taping [7]. The author described about the case of AC Joint dislocation which has been documented in literature for the sixth time. According to the author three of the five prior patients received unsuccessful orthopaedic treatment. The two instances that underwent surgical treatment similarly did not yield satisfactory outcomes. The sixth patient, which was surgically handled, had the best clinical and functional results of all five previously described cases, with full reintegration of daily activities and no problems or relapses [1].

For type V AC joint injuries, there are numerous surgical options. Using the tip of the coracoid process and the connected conjoined tendon, these include AC repairs, coracoclavicular repairs, combined AC and coracoclavicular repairs, coracoclavicular fusion, and dynamic muscle transfers. These days, intra-articular AC repairs or coracoclavicular AC repairs are the most common stabilization techniques. To

stabilize the junction, tiny, threaded or smooth Steinmann pins or K-wires are a typical method. It has also been explained how to use a hook plate. A unique fixation that was superior to previous implants because of an altered medial proximal tibial locking plate that allowed 3.5 screws to be used in both locking and non-locking modes [3].

In this present case, the Acromio clavicular dislocation was managed with AC joint reconstruction with k wire fixation and ipsilateral palmaris longus graft, a technique that is commonly performed to treat AC Joint dislocation with ligament involvement. This reduction technique allows for AC joint relocation, allowing early mobilisation. Even after surgery the patient complaint of impingement so the removal of k wire was required. To the best of our knowledge this is the first case report which is emphasizing on the importance of physiotherapy treatment in case of a surgically managed AC joint dislocation.

Operative therapy of AC joint dislocation can lead to a variety of problems, with common outcomes including hardware failure, migration, or distal clavicle osteolysis in addition to AC arthritis, shoulder discomfort, and periarthritis shoulder. Implant cut out as a result of rotating motions between the acromion and clavicle [3]. These injuries pose a surgical challenge regardless of the operative management used, and meticulous pre-operative planning is necessary to guarantee optimal intraoperative management, implant availability, and to reduce the chance of fixation failure and eventual reoperation [8].

Comprehending the anatomy and biomechanics of the glenohumerus is essential for identifying the afflicted dynamic or static components and determining the best course of treatment [1]. The authors discovered that in order to address instability in both the vertical and horizontal planes, it is important to treat both the coracoclavicular and acromioclavicular functional insufficiencies. In order to treat AC instability in both the vertical and horizontal planes, as well as the concomitant thoracic scapular dyskinesia that improves scapular fixation for sufficient glenohumeral mobilization, clavioclavicular and coracoclavicular fixation are required. Additionally, this removes referred pain, enabling the patient to resume regular activities and sports without experiencing any symptoms [1]. Acromioclavicular injuries, both acute and chronic, are linked to scapular dyskinesia. An injury resulting from overuse and muscle fatigue is known as SICK scapular syndrome, which includes scapular malposition, inferomedial border prominence, coracoid pain and malposition, and scapular motion dyskinesia. Acromioclavicular injury may also be linked to isolated scapular dyskinesia [1].

Our case thus highlights the importance of orthopaedic assessment following AC joint injury and importance of the role of physiotherapy to rehabilitate the patient back to his pre fall functional levels.

Points for Consideration

- A thorough orthopaedic assessment is important when patient with AC joint dislocation is referred to the physiotherapy OPD.
- A goal oriented physiotherapy treatment plan is essential to rehabilitate patient with AC joint dislocation.
- Physiotherapy treatment plan should be targeted to reduce post injury/ post surgical secondary complications like shoulder stiffness, peri-arthritis shoulder & others.

5. Conclusion

The case report presented is, to the best our knowledge, the seventh case described in the literature that was managed operatively and role of physiotherapy treatment to rehabilitate this subject to the pre injury level have been pointed out. The patient was found with shoulder problems for which particular

physiotherapy treatment was planned. Further follow up of the patient will be required which will show the promising results that could help in planning the treatment of future cases.

6. Conflicts of Interest:

The authors hereby state that we have no potential conflicts of interest to declare.

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