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Original Research Paper

Orthopaedics

ANALYSIS OF FUNCTIONAL OUTCOME OF ACROMIOCLAVICULAR JOINT DISLOCATION REPAIR USING ENDOBUTTON TECHNIQUE

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ABSTRACT

Introduction: Injuries to the acromioclavicular (AC) joint make up about 9% of shoulder girdle injuries. There is a range of soft tissue disruptions that can cause pain in the acromioclavicular (AC) joint injuries, from slight, passing discomfort to severe pain. Long-term impairment is caused by dislocation, chronic discomfort, and alterations in the shoulder's biomechanics. **Methods:** This is an cross sectional type of study at SAMC & PGI Indore. This fixation procedure has been applied on 30 patients. Indications of the technique included: a grade 2 – 5 AC joint according to Rockwood classification. The coracoclavicular (CC) interval and AC joint were reduced using endobuttons. Outcomes were assessed with the Constant shoulder score and DASH score. Information on the patients was compiled from clinical details, case files and operation theatre records who were followed up for the duration of 6 months. **Conclusion:** Early functional recovery and complete range of shoulder motion are the results of Endobutton restoration of the AC joint. Endobutton prevents complications from implants and additional surgery to remove implants. In our series, the use of double Endobutton has produced good functional outcomes and pain-free shoulder motion. Intraoperative and postoperative problems are infrequent. Endobutton provide the acromioclavicular joint with both vertical and horizontal support.

KEYWORDS : Acromioclavicular Joint, Dislocation, Endobutton , Shoulder Joint

INTRODUCTION

Injuries to the acromioclavicular (AC) joint make up about 9% of shoulder girdle injuries. AC joint injuries cause momentary discomfort to severe dislocation, chronic pain, and changes in shoulder biomechanics that lead to long-term impairment. A direct impact to the lateral portion of the shoulder is the most prevalent mechanism of injury with a male to female ratio of about 5:1 and an age range affected of under 30 years. Our study primarily examines the functional result of full acromioclavicular injuries treated with Endobutton, an anatomical repair of coracoclavicular ligaments. To determine the effectiveness of this surgery, the outcomes will be analyzed based on clinical and radiological examination.

AIMS AND OBJECTIVES

1. To study functional outcome of endobutton reconstructions done for Acromioclavicular joint disruptions
2. To identify complications related with the procedure .
3. To assess the reduction and AC joint stability
4. To assess the functional status using DASH SCORE and CONSTANT SCORE at 3 weeks, 3 month , 6 months
5. To assess the time taken to reach pre-injury functional status.

Anatomy Around Acromioclavicular Joint

he Acromioclavicular joint is a synovial joint that is created by the articulation of the lateral end of the clavicle with the acromion. The AC joint contains a fibrocartilaginous disk that varies in size and form. When observed from the front and back, the AC joint is nearly vertical, with the clavicle positioned at an angle of up to 50 degrees downward and inward, overlapping the acromion.

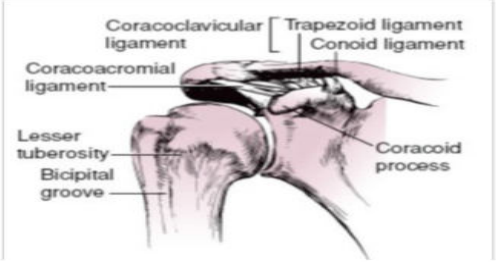

Fig 1 : Anatomy Around Ac Joint

Biomechanics

- The biomechanics of the AC joint involve both static and dynamic stability. Clavicles hanging away from the body by strong SC ligaments, resembling the wings from the body of an airplane in erect posture. The CC ligament provides support for the upper extremities, which are attached to the distal clavicle. Thus, the prime suspensory ligament of upper extremity is CC ligament.
- CC ligaments (conoid and trapezoid) and the AC capsule and ligaments gives AC joint stability primarily. Only after the CC ligaments are transected, vertical displacement of the clavicle occurs.At both large and small displacements, the primary restraint for compression of AC joint is the trapezoid ligament. At both large and small displacements, the primary restriction for compression of AC joint is the trapezoid ligament

Mechanism Of Injury :

One of the more typical mechanism is direct force involves falling or being tackled onto the lateral side of the shoulder with the arm in an adducted position which causes a compressive (medial) and shear (vertical) force across the joint.

The injury force which drives the acromion medially and downward generates a gradual damage pattern; disruption of the AC ligaments, followed by CC ligaments, and lastly disruption of the fascia overlaying the clavicle that joins the deltoid and trapezius muscle attachments

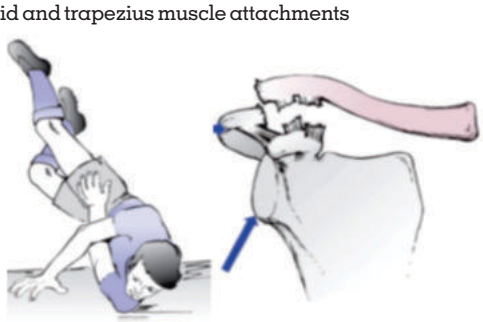

Fig 2 : Mechanism Of Injury

Classification

Rockwood And Green Classification

Table. Rockwood Classification of AC joint injuries.

Type	Direction of clavicle displacement	Radiographic findings
I	None	No increase in coracoclavicular (CC) interspace
II	Superior	CC interspace increase of < 25%
III	Superior	CC interspace increase of 25% to 100%
IV	Posterior	Axillary view necessary to diagnose. Distal clavicle displaced posteriorly through trapezius.
V	Superior	CC distance > 100% of contralateral (clavicle herniated through deltotrapezial fascia)
VI	Inferior	Distal clavicle is subacromial or subcoracoid. Rare injury.

MATERIAL AND METHODS

- This is an cross sectional type of study at SAMC & PGI Indore.
- This fixation procedure has been applied on 30 patients.
- Indications of the technique included: a Grade 2 – 5 AC joint according to Rockwood classification.
- Outcomes were assessed with the Constant shoulder score and DASH score.

(DASH questionnaire has 30 questions to be answered by the patient relating to activities of daily living, pain and confidence. Poorest outcome is 100 while the best outcome is a score of zero.)

- Information on the patients was compiled from clinical details, case files and operation theatre records who were followed up for the duration of 6 months.

DISCUSSION

- Press et al. [1] reported that the surgery group had better pain free status, subjective impression of pain, ROM, less functional limitations, better cosmesis, faster return to full work duties, and long-term reported satisfaction in a series of patients with Type III ACJ injuries treated by both methods.
- Additionally, Gstettner et al.'s [2]comparison study of Type III ACJ injuries treated surgically versus conservatively revealed superior functional and radiological outcomes in the surgical group.
- Fixation with Kirschner wires is not used often at present because of high rates of complications such as breakage and material migration, infection, arthritis and loss of reduction.[3]
- The technique of stabilization between the clavicle and the coracoid process using the Endobutton or anchors has been described by various authors [4] with satisfactory results. Its advantages include the fact that it is not necessary to remove synthetic material and it has been shown to be effective in restoring and maintaining the reduction of the ACJ.
- In our study, the technique permitted a small open approach with relatively short surgical time.
- The degree of satisfaction (excellent and good) among patients who underwent the Endobutton procedure in our study was 94%.

RESULTS

- 30 patients participated in our cross-sectional study, whose operations were spread out over an 18-month period.
- Their median age was 46, with a range of 26 to 54.
- The average number of days between the injury and the operation date was 12.3 (the range was 6 to 18).
- The average procedure was 48 minutes, with a 38 to 56 minute range.
- None of the patients experienced post-operative mobility limitation (ROM), and their mean Quick DASH scores at the end of the follow-up were 4.8 (range 0-7.2) and Constant score was 95 (range 80 -100),. All patients were able to pick up where they left off in terms of work, sport, or activity.

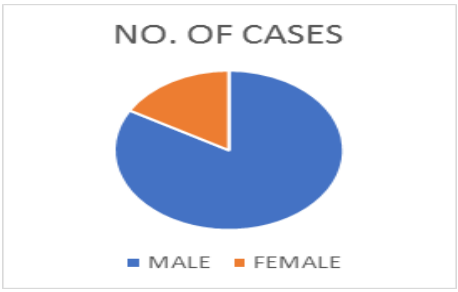

Fig 4 : Sex Wise Distribution

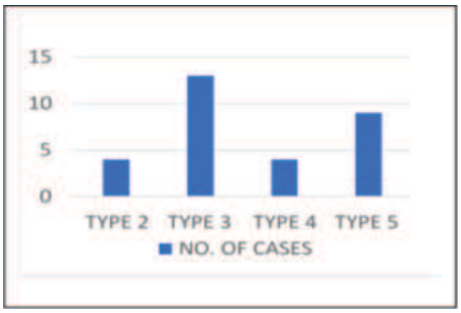

Fig 5 : Type Of Fractures According Rockwood Classification

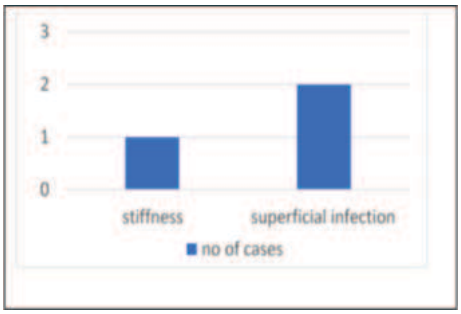

Figure 6 : Complications

CASES

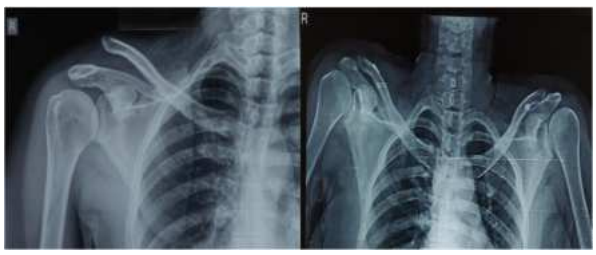

Fig 7 : Pre Operative Xray **Fig 8 : Post Operative Xray**

Fig 9 : 3 Months Follow Up **Fig 10 : 6 Months Follow Up**

CONCLUSION

- AC joint reconstruction by Endobutton results in early functional recovery and full range of shoulder movements.

- It produces good cosmetic results along with satisfactory functional and radiological results. Endobutton avoids the implant related complications and further surgery to remove the implant.
- Intraoperative and post operative complications are minimal in our case series.
- Endobutton gives both vertical &horizontal stability of Acromioclavicular joint.
- At present we have only 6 month follow up , in this short term follow up Endobutton provides Excellent outcome and long term results are awaited.

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