Acromioclavicular Joint Dislocation: A Comparative Study of the Palmaris Longus Tendon Graft Reconstruction versus Clavicular Hook Plate Fixation

Dr. Anshu Anand1, Dr. Avinash Kumar Sinha2, Dr. Ashish Raj3, Dr. Kumar Mayank4, Dr. A. K. Manav5

1Senior Resident, P. M. C. H., Patna
2Junior Resident, P. M. C. H., Patna
3Junior Resident, P. M. C. H., Patna
4Junior Resident, P. M. C. H., Patna
5Associate Professor, P. M. C. H., Patna

Abstract: Aim of the Study: 1) To compare the Acromioclavicular joint dislocation treated by autograft tendon repair versus hook plate fixation. 2) Outcome in long term followup based on functional results. Materials and Methods: This is a prospective study carried out in department of orthopaedics P. M. C. H. Patna from May 2015-April 2018 on a subset of 10 patients. Observation: Out of 10 patients (Grade 3; 4; Grade 4; 4; Grade 5; 2) of Acromioclavicular joint dislocations, 5 patients were treated by palmaris longus autograft for the coracoclavicular ligament repair and 5 were treated by clavicular hook plate patients were followed up till 1 year postoperatively. Functional outcome in both the groups were same at the end of their follow up. One of the patient treated by clavicular hook plate had hardware prominence and another had clavicle instability in whom tendon autograft was used while rest has had no complications. Conclusion: In our study we have found out that there is no difference in the functional outcomes of the subset of the patients treated by tendon repair or hook plate for acromioclavicular joint dislocation.

Keywords: Acromioclavicular Joint Dislocation; Palmaris Longus Tendon, Clavicular Hook Plate

1. Introduction

The acromioclavicular and coracoclavicular ligaments of the shoulder joints are prone to sports injuries. The mechanism of injury usually involves a direct trauma to the superior aspect of the acromion and includes inferior and anterior translation of acromion in relation to the distal aspect of the clavicle. Operative treatment has been advocated for certain type 3 Acromioclavicular joint separations and certainly in types 4 and 5 acromioclavicular joint injuries(1).

Previous studies have demonstrated the acromioclavicular ligaments control anterior posterior stability, while the coracoclavicular ligaments control superior inferior stability (1,2).

Current operative techniques can be classified into 2 groups:-
1) Those that focus on primary healing of the coracoclavicular ligaments, by holding the clavicle and coracoid in a reduced position and 2) those that focus on reconstructing the coracoclavicular ligament using local tissue transfers or tendon grafts. The former utilises fixation of the Acromioclavicular joint using K-wires, tension banding and clavicular hook plates or fixing the coracoid to clavicle using screws, sutures. The latter transfers local tissue sources to the clavicle or uses tendon grafts. One common problem with these techniques remains the weak initial fixation of the ligament or tendon to the clavicle (3, 4, 5).

There is an increasing trend in using tendon grafts for reconstructing the coracoclavicular ligaments.

2. Materials and Methods

A prospective study conducted in the department of orthopaedics PMCH Patna from May 2015 to April 2018 on a subset of 10 patients in the age group (25-50 years). There were 6 male and 4 female patients. There were 5 right shoulders and 5 left shoulders involvements. Out of the 10 cases, 4 cases were of Rockwood type 3 and 4 each while 2 cases belonged to Rockwood type 5.

Inclusion Criteria:
1) Unstable Acromioclavicular Joint.
2) Rockwood type 3, 4 and 5.
3) Absence of comminuted scapular fracture.
4) Age-25-50 years.

Exclusion Criteria:
1) Stable Acromioclavicular joint
2) Rockwood type 1 and 2
3) Gross comminuted scapular fracture or floating shoulder injuries.

Volume 11 Issue 1, January 2022

www.ijsr.net
Licensed Under Creative Commons Attribution CC BY

Paper ID: MR22123171528 DOI: 10.21275/MR22123171528 1232
4) Age less than 20 years or more than 50 years.

For Diagnosis:-  
AP and Axillary X Ray views were used. MRI were used in some cases.

3. Techniques

A. Pamaris Longus Tendon Graft
The graft was prepared after being harvested from the volar aspect of forearm via two 1 cm transverse mid-axial incisions spaced about 10 cm apart. Prior to testing, a tendon graft was then passed through the 3.2 mm holes, each drilled at the distal end of the clavicle and at the acromion, 1 cm away from acromioclavicular joint with the ends secured in a pulvertaft fashion, using no.2 ethibond sutures (6).

B. Clavicle Hook Plate Augmentation
The acromioclavicular joint was reduced under vision. The clavicle hook plates with 6 or 7 holes, are pre-contoured in left and right plates. They are available in commercially pure titanium and stainless steel. The hook of the plate with a 15 mm or 18 mm hook depth was first passed under the acromion, then on the superior aspect of the clavicle. Finally, 3.5 mm cortical screws were placed in the medial and anterior lateral screw holes (7, 8).

4. Result

Patients were graded into excellent, good, fair and poor based on their postoperative assessment of pain, motion and strength and activity.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Pain</th>
<th>Motion &amp; Strength</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>No</td>
<td>Normal</td>
<td>No compromise</td>
</tr>
<tr>
<td>Good</td>
<td>Occasional</td>
<td>Normal</td>
<td>No compromise</td>
</tr>
<tr>
<td>Fair</td>
<td>During activity</td>
<td>Limited (&lt;20°)</td>
<td>Limited</td>
</tr>
<tr>
<td>Poor</td>
<td>Constant requiring medication</td>
<td>Limited (&lt;20°)</td>
<td>Limited</td>
</tr>
</tbody>
</table>

Rehabilitation:
Sling was used for 6-8 weeks while beginning gentle range of motion in weeks 1 to 3. Isometric strengthening exercises can be started after 4 weeks while patient is in sling as well as after the sling is discontinued. Six weeks is the earliest time point that unsupported arm range of motion should be performed in order to allow biological healing. Full strengthening can begin approximately 12 weeks postoperatively; and patient can return to all activities at 4-6 months.

S. No. | Age (Yr) / Sex | Side | Days Old | Operation | Result |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26 / Male</td>
<td>Right</td>
<td>02</td>
<td>Clavicle hook plate</td>
<td>Excellent</td>
</tr>
<tr>
<td>2</td>
<td>29 / Male</td>
<td>Right</td>
<td>02</td>
<td>Clavicle hook plate</td>
<td>Excellent</td>
</tr>
<tr>
<td>3</td>
<td>26 / Male</td>
<td>Left</td>
<td>06</td>
<td>Clavicle hook plate</td>
<td>Good</td>
</tr>
<tr>
<td>4</td>
<td>34 / Female</td>
<td>Left</td>
<td>14</td>
<td>Clavicle hook plate</td>
<td>Excellent</td>
</tr>
<tr>
<td>5</td>
<td>39 / Female</td>
<td>Right</td>
<td>17</td>
<td>Tendon Graft</td>
<td>Excellent</td>
</tr>
<tr>
<td>6</td>
<td>48 / Female</td>
<td>Right</td>
<td>22</td>
<td>Tendon Graft</td>
<td>Poor</td>
</tr>
<tr>
<td>7</td>
<td>30 / Male</td>
<td>Left</td>
<td>21</td>
<td>Tendon Graft</td>
<td>Good</td>
</tr>
<tr>
<td>8</td>
<td>48 / Male</td>
<td>Left</td>
<td>27</td>
<td>Tendon Graft</td>
<td>Fair</td>
</tr>
<tr>
<td>9</td>
<td>41 / Male</td>
<td>Left</td>
<td>12</td>
<td>Tendon Graft</td>
<td>Excellent</td>
</tr>
<tr>
<td>10</td>
<td>47 / Female</td>
<td>Right</td>
<td>09</td>
<td>Clavicle hook Plate</td>
<td>Poor</td>
</tr>
</tbody>
</table>

Mean-36.8 Yrs. | 13.2
5. Discussion

Management of acromioclavicular joint injuries remain controversial and continues to evolve over the past decades. Modalities of treatment have been changed with increasing understanding of biomechanics of the joint and nature of problem. After failure of a low of conservative measures used previously various operative methods have been proposed for the anatomical reduction of acromioclavicular joint which is essential in active and high demand patients like sportsmen.

The average age of patients in our study was 36.8 years (range 25-50 yrs.). Most beingf younger age group. They had equal incidence for the side involved. The average time interval of the reported injury was 13.2 days. (range 2 to 30 days). There was no significant difference in the final outcomes between old and new injuries.

Out of 5 patients treated by clavicular hook plate 3 had excellent outcomes, 1 had good and 1 had poor due to hardware prominence for which implant removal was done at 6 months and gradually full range of motion was obtained at the end of 1 year of follow up.

The patients treated by palmaris longus tendon had 2 excellent results; 1 good, fair and poor each. The patient with fair outcome was given analgesics, short wave diathermy therapy and was immobilised for weeks and then gradually allowed range of motion exercises from 9th week. The patient with poor outcome had clavicular instability due to poor tendon reconstruct. He is still in our follow up and we are planning for re-operating him.

6. Conclusion

There is still no clear consensus regarding the best treatment modalities for the type 3, 4 and 5 acromioclavicular joint dislocations. The modalities of treatment have their own advantages and disadvantages. From this study we have concluded that both clavicular hook plate and palmaris longus tendon autograft have similar outcomes as far as painless and functional joint along with full range of motion attainment is concerned.

7. Disclaimer

There is no conflict of interest.

There is no financial involvement.

References


Volume 11 Issue 1, January 2022
www.ijsr.net
Licensed Under Creative Commons Attribution CC BY

Paper ID: MR22123171528      DOI: 10.21275/MR22123171528    1234