



FUNCTIONAL OUTCOME OF SURGICAL STABILISATION OF ACROMIOCLAVICULAR JOINT DISLOCATION

Dr VARKEY S KULANGARA

Resident in Orthopaedics, Govt Medical College, Thrissur, Kerala

Dr. SHIBU ANDREWS

Additional Professor of Orthopaedics, govt Medical College, Thriissur, Kerala

Dr. JOSE FRANCIS

Professor and Head of Orthopaedics, Govt. Medical College Thrissur, Kerala

ABSTRACT

Acromio - clavicular joint dislocation corresponds to 8.6% of all joint dislocations. The purpose of this study is to determine the functional outcome of operative treatment of Type III and above severity, of acromio clavicular dislocations. 30 patients with acromioclavicular joint dislocations fitting the inclusion criteria were selected. The AC joint is reset manually, and the joint is stabilized with either 2 parallel non-threaded K-wires from the lateral edge of the acromion into the clavicle and tension banding using steel wire, or with 1 partially threaded 4.5-mm coracoclavicular cancellous screw. Functional outcome assessed after 6 months using Constant-Murley Shoulder Outcome Score. Out of 30 patients, 18 had coracoclavicular screw fixation and 12 had tension band wiring across AC joint. Average Constant Murley Shoulder Outcome score was 91.27. Excellent results were obtained for 23 cases (77%) and good results for 7 cases (23%). Surgical stabilisation is a good method for treating acromioclavicular joint dislocations type 3 and above. Post operative rehabilitation and proper follow up are necessary for good functional outcome.

KEYWORDS : Acromioclavicular joint dislocation, Functional outcome, Constant Score, coracoclavicular screw, Tension band wire

INTRODUCTION

Acromio clavicular joint dislocation corresponds to 8.6% of all joint dislocations and represents a major injury to shoulder girdle. Non operative treatment is considered as the standard of care for type I and II Acromio clavicular joint dislocations. But treatment of acute type III and above injuries is still controversial¹.

Hippocrates³ stated that “no impediment small or great, will result from such an injury but there would be a tumefaction or deformity for the bone that cannot be restored to its natural position.” This statement holds good even for today. There is probably no other joint in the body that has been treated in so many different ways in attempts to “properly restore” it to its “natural position.”

Rockwood² classified AC joint dislocation into 6 types. Type I and II are characterised by rupture of acromio clavicular ligaments with the loss of horizontal stability. In Type III AC joint dislocation there is also rupture of the coraco-clavicular ligaments with loss of vertical stability, resulting in dislocation.

In 1946 Urist⁴ reviewed 101 previous papers and reported that the results after surgery for internal fixation of AC joint were no better than the conservative treatment.

The purpose of this study is to determine the functional outcome of operative treatment of acromio clavicular dislocations, type 3 and above and to determine whether surgical treatment is effective for AC joint dislocations of type III and above.

MATERIALS AND METHODS

The present study is a prospective study of 30 patients aged more than 18 years, who sustained type 3 and above acromioclavicular joint dislocation, treated by open reduction and internal fixation in the department of Orthopaedics, Government medical college hospital, Thrissur, from January 1st 2015 to January 1st 2016.

After proper history taking, clinical examination, radiological work up, pre operative work up and informed written consent, patients will be taken up for surgery. Surgery will be done by the guide with the assistance of the principal investigator. Patients will be taken up for surgery as early as possible after routine hematological and radiological work up.

The patient lay in a beach-chair position with the head turned away

from the side of the fracture. A curved incision is made along the anterosuperior margin of acromion and lateral one-fourth of clavicle. Full thickness subcutaneous flaps are developed to expose the deltoid and trapezius aponeuroses, AC joint, and lateral 2 to 3 cm of distal clavicle. Any remnant of the intra-articular disc is excised.

The AC joint is held in reduced or slightly overreduced position by applying an axial, compressive load to the humerus and the joint is stabilized with either 2 parallel non-threaded K-wires from the lateral edge of the acromion into the clavicle and tension band wiring using steel wire, or with one partially threaded 4.5-mm cancellous lag screw through clavicle into coracoid. The lateral ends of the K-wires are bent to prevent migration medially. Ruptured AC and CC ligaments are sutured. The meniscus is removed and distal clavicle is excised to eliminate a potential source of pain long term. The position of the AC joint and the implants are ascertained with intraoperative radiographs. The deltoid and the trapezial aponeurosis and calvaricular periosteum are re-attached. The sub-cutaneous tissue and skin are closed in layers. The postoperative treatment protocol is uniform in all patients. The arm is immobilized in a sling for 3 weeks. Pendulum and passive external rotation exercises are then initiated. K-wires and screws are removed 6–8 weeks after surgery under local anesthesia. Biodegradable screws are not removed.

Operation details are recorded and Post operative rehabilitation done and recorded. Patient is discharged from hospital with appropriate advice regarding immobilisation, ROM exercises.

The functional outcome was assessed at 6 months using Constant Murley Shoulder Outcome Score : subjectively for Pain and Activities of daily living and objectively for ROM and Strength.

RESULTS

The participants included 27(90%) males and 3(10%) females. 50% of the patients belonged to the age group of 31 to 40 years followed by 27% belonging to 18 to 30 years age group. 26(87%) of patients sustained the injury as a result of fall and the remaining 4(13%) patients sustained injury following RTA. 18(60%) patients underwent coracoclavicular screw fixation and 12(40%) underwent tension band wiring of the AC joint

TABLE 1 – TYPE OF SURGERY

SURGERY	FREQUENCY	PERCENTAGE
TENSION BAND WIRING	12	40

CORACOCLAVICULAR SCREW	18	60
TOTAL	30	100

Out of the 30 operated cases 2(7%) patient developed superficial infection and 1(3%) patient developed pin loosening.

TABLE 2- POST OPERATIVE COMPLICATIONS

POST OPERATIVE COMPLICATIONS	FREQUENCY	PERCENTAGE
NIL	27	90
SUPERFICIAL INFECTION	2	7
PIN LOOSENING	1	3
TOTAL	30	100

The functional outcome was assessed using Constant scoring system and 23(77%) patients had excellent results and 7(23%) patients had good results.

TABLE 3 – FUNCTIONAL OUTCOME

The functional outcome was assessed via Constant scoring system, the results were graded as

SCORE	DIFFERENCE FROM NORMAL SIDE	OUTCOME	FREQUENCY	PERCENTAGE
90- 100	0-10	EXCELLENT	23	77
80-89	11-20	GOOD	7	23
70-79	21-30	FAIR	NIL	0
BELOW 70	>30	POOR	NIL	0
TOTAL			30	100

DISCUSSION

The framework of shoulder in up right position is maintained in its normal anatomical position by the interlocking of sternoclavicular ligaments. The second mechanism which resist any significant downward displacement of the distal clavicle is by the upward support of the trapezius muscle. The scapula is suspended from the clavicle primarily by coracoclavicular ligament.

There is considerable controversy as to the best method of management of Type 3 AC dislocation. In 1959 Urist⁵ published an extensive survey of treatment of AC dislocation involving 32 methods of conservative treatment and 5 open techniques. Patients younger than 18 years were arbitrarily excluded because of presence of open epiphysis which theoretically may introduce an important variable. In this study grade 1 and grade 2 dislocations were excluded as conservative treatment is the accepted standard treatment. Stress x-rays were used to differentiate between grade 3 and grade 2 at initial presentation.

In this study, a series of 30 cases of AC joint dislocations treated surgically have been studied and the following results were obtained. The age of patients ranged from a minimum of 26 years to a maximum of 50 years. The average was found to be 36 years. In a study conducted by Timothy et al⁶ 127 patients with acute acromioclavicular joint injuries were treated 73 percent of the patients were between eighteen and twenty five years of age.

In our study, out of the 30 cases 26(87%) patients sustained injury following fall on the shoulder. The remaining 4(13%) patients sustained injury following RTA. Hari et al⁷ conducted a study on 18 patients with type 3 AC joint dislocation mechanism of injury was fall in 60% of patients. In a study conducted by Chillemi C et al⁸ the most common mechanism of injury was sports injuries In our study on the 30 patients, average Constant score obtained was 91.27. twenty three of them had excellent results and 7 of them had good results at the end of 6 months. Choi S⁹ et al conducted a study on 43 patients treated surgically for AC joint dislocation for a period of 59.6 months and the average Constant score obtained was 91.2(range 74-100). 15 cases of open reduction and internal fixation reviewed by Roper and Levack¹⁴ had 100% good results.

Out of the 30 patients we studied 3 of them developed complications. These 3 patients were operated by tension band wiring technique. Two of them had superficial infection and one of them had pin loosening. In a study conducted by Gohring et al¹⁰ 43% of patients treated by

Tension band wiring developed complications. Malposition of k wire was noticed in 6 out of 40 patients operated by tension band wiring technique in a study conducted by Tuckem et al¹¹.

Conclusion

We have done a prospective study for finding out the functional outcome of surgical stabilization of acromioclavicular joint dislocation in 30 patients over a period of 18 months from January 2015 to July 2016 in the Department of Orthopedics Govt. Medical College Hospital, Thrissur. All the patients who came with acromioclavicular joint dislocation-type3 and above, were admitted to the ward, clinical, hematological and radiological workups were done. Dislocation was reduced and fixed with either coracoclavicular screw or tension band wiring. Patients were discharged after suture removal around post op day10 and regularly followed up for 6 months. Pendulum motion, abduction, and flexion up to the horizontal plane are started after 3 weeks. Fully active motion is allowed after removal of implants. K-wires and screws are removed 6–8 weeks after surgery under local anesthesia. Functional outcome was measured after six months using Constant Murley Shoulder outcome score and final results were obtained. The results of the study are excellent and are comparable with other studies in the literature review. All patients had significant improvement in the function which was near normal.

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