Functional Outcome of Acromioclavicular Dislocation Treated By Hook Plate

*Dr. Muthugukan Raja¹, Asst prof Dr. Senthil Loganathan², Prof. Samuel Chitranjan³
Sri Ramachandra University, Porur.
Corresponding Author: * Asst prof Dr. Senthil Loganathan

Abstract

Background: Internal fixation with hook plate has been used to treat acromioclavicular joint dislocation. This study aims to evaluate the effect of its use on shoulder function, to further analyze the contributing factors, and provide a basis for selection and design of improved internal fixation treatment of the acromioclavicular joint dislocation in the future.

Methods: A prospective analysis was performed on patients treated with a hook plate for acromioclavicular joint dislocation in our hospital from January 2014 to February 2016. There were 15 cases in total, including 9 males and 6 females, with mean age of 48.27 ± 8.7 years. There were 10 cases of Rockwood type IV acromioclavicular dislocation, 5 cases of type V.

Results: The PENN Score was Excellent in 13 patients, Good in 1 patient and Fair in 1 patient, and in Constant Shoulder Score was excellent in 14 patients and fair in 1 patient. All patient achieved range of movements equal to that of the contralateral side at 5 weeks.

Discussion: The use of hook plate on open reduction and internal fixation of the acromioclavicular joint dislocation had little adverse effect on shoulder function and is an effective method for the treatment of acromioclavicular joint dislocation. Osteoarthritis and osteolysis are the two common complications after hook plate use, which are associated with the impairment of shoulder function. Shoulder function will be improved after removal of the hook plate.

Date of Submission: 01-11-2017
Date of acceptance: 16-11-2017

I. Introduction

Acromioclavicular joint injuries are a common entity with an ever-evolving approach towards management of these injuries from the days of Hippocrates [1] and Galen [2]. The quantum of these injuries is on the rise constituting approximately 9–12% of all shoulder injuries following fall on an outstretched hand [3–6]. The commonly used classification is Rockwood divides these injuries into six types [7]. Rockwood type III injuries remains controversial, Though we still follow conservative management for Rockwood type I and II injuries and surgical treatment for Rockwood type IV, V and VI injuries [8–11]. Various approaches are described ranging from conservative management with bandages and slings to different surgical options including tension band wiring, fixation with washer and screws, the modified Weaver–Dunn procedure and clavicular hook plates. All of these options have their own specific advantages and disadvantages, but no clearly superior option has been established as yet [12]. Clavicular hook plates are anatomically designed pre contoured plates with varying sizes and depths as well as sides. Post reduction of acromioclavicular joint the hook plate is placed under the acromion process posteriorly and the screws are used to fix the plate to lateral clavicle to maintain reduction. As routine plates are removed after 3 months to avoid complications such as acromial osteolysis, subacromial impingement. Rockwood type 3 acromioclavicular dislocation treated with hook plate has raised the concerns about acromial osteolysis, Subacromial impingement and possibly rotator cuff injuries [13–15]. We used this prospective study to establish the efficacy of clavicular hook plate without reconstructing coracoclavicular/acromioclavicular ligaments in high demand patients.

II. Materials And Methods

A prospective analysis was done in SRMC from January 2014 to February 2016. We treated patients with a hook plate for acromioclavicular joint dislocation. We a total of 15 patients, after obtaining informed consent for the study of publication research and photos including [9 males and 6 females], with mean age of 48.27 ± 8.7 years. We classified acromioclavicular joint dislocation with Rockwood. Apart which 10 cases were type IV and 5 cases were under type V.
The inclusion criteria includes Rockwood type III, IV, V, VI. Acromioclavicular joint disruption associated with injury of lateral end of clavicle. The exclusion criteria includes pediatric acromioclavicular disruption, Grade I and II disruption associated with nerve injuries.

All the 15 patients were radiographically evaluated with a standard anteroposterior view and stress views which was classified by the surgeon. These radiographs were compared with non-injured shoulder X-rays for coracoclavicular distance. All the patients were operated in a supine position under general anesthesia/Regional anesthesia. Robert approach was used to expose the acromioclavicular joint in all patients. Intraoperative needle was used to demarcate the acromioclavicular joint. Intraoperatively we measured the depth of acromion posteriorly till the tip of supraspinatus using a depth gage and accordingly we chose the depth of hook plates. (Fig:1-6).

Post-operatively, arm sling was used for 10 days to 2 weeks. Pendulum exercise was started after 24 hours assisted with active flexion and extension movements following by light resisting exercise after 6 weeks was started and complete full range of movements was started after 12 weeks. Postoperative functional outcome was assessed by using PENN score and Constant Shoulder Score. Assessed at the regular interval for 1 year (pre op – immediate post op – 6 weeks – 6 months – 1 year).
III. Results

Follow up of 15 patients for a period of 1 year using PENN score and Constant score in which we observed PENN score showed Excellent results in 86.66%(13 Cases) Good in 6.66%(1 Case) , Fair in 6.66%(1 case) and Constant score had excellent results in 93.33%(14 cases) and Fair in 6.66%(1 case), there was no bad scoring in both PENN score and Constant score. 1 patient had subacromial osteolysis on 6 months post-op. this did not have any clinical implication but implant was removed. 1 patient developed impingement and had restriction of shoulder movements hence implant was removed.
IV. Conclusion

Acromio-clavicular joint injuries can be effectively treated by hook plate application. Using appropriate size hook can minimise impingement syndrome.

V. Discussion

The basic knowledge of shoulder biomechanics is important for diagnosis and treatment of AC joint disorders.[16] Surgical treatment enables restoration of AC joint anatomy such as K-wire fixation, coracoclavicular fixation, Lateral end plates, Hook plate fixation, Weaver dunn procedure, but there may be a complications associated with breakage and / or migration of pins.[17] The relative rotatory movements of clavicle during abduction of shoulder cause failure of K-wire fixation and Cancellous screw fixation. The clavicle hook plates is designed to fit anatomically to the Acromian and clavicle. The hook extending from the plate act a lever beneath the acromion. The hook plate allows rotatory movements between acromion and clavicle.[18] The main complication with hook plate is that the plate My cause sub-acromial impingement, sub-acromial osteolysis or even rotator cuff tear.[19] We sought to determine by measuring the depth between acromion and supra spinatus tendon intra operatively and fixed with appropriate hook plates to prevent sub acromial impingement and sub acromial osteolysis. Few complication was noted in our study with patients was able to go back to their previous job and activity without any functional disability.

Reference

[19]. Fractures. AAMJ, 10, No. 3.

* Asst prof Dr. Senthil Loganathan. "Functional Outcome of Acromioclavicular Dislocation Treated By Hook Plate." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 16.11 (2017): 29-32