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Original Article

Arthroscopic stabilization of acute acromioclavicular joint dislocation with tightrope AC system: A tale of failures

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ABSTRACT

Background: Stabilization of acromioclavicular joint is a challenging technique with several methods described in literature from non-biological methods to biological fixation of AC joint. Arthroscopic fixation of AC joint is a newer technique with limited literature available. The aim of our study is to evaluate the results of arthroscopic stabilization of acute acromioclavicular joint with tightrope.

Methods: From February 2013 till August 2013, arthroscopic stabilization of acute ACJ dislocation was performed in 11 patients. The group consisted of eight men and three women with an average age of 34.2 years. The Rockwood type III to type V ACJ dislocations (III, 6; IV, 2; V, 3) were indicated for surgery. The average interval between injury and surgery was 5.4 days. In all cases, a second-generation tightrope implant was inserted by the Endobutton technique joining the distal end of the clavicle and the coracoid process. The results were evaluated using the UCLA Shoulder Scale at 10 months after surgery.

Results: All 11 patients returned to their preoperative activities without any restriction of shoulder motion within 5 months of surgery. The average postoperative UCLA score was 30.3 points (range 27–34). Radiographic evidence of the loss of partial reduction, with no effect on the clinical outcome, was recorded in 5 patients (45%) and loss of full reduction noted in 5 (45%) patients during postoperative rehabilitation. **Conclusion:** Arthroscopic stabilization of acute ACJ dislocations using a single tightrope implant is a minimally invasive surgical technique, but less satisfactory result may be because of non-biological nature of fixation. Non-biological AC joint fixation is not a good method of fixation of a biological AC joint.

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Table 1 – Patient demographics and coracoclavicular distance measurements.

Patient	Age/sex	Occupation	Rockwood type	Coracoclavicular distance				Time of failure (months)	Reason of failure
				Preop	Normal/ Contralateral side	Postop	At one year		
1	30 y/M	Labourer	III	17	10	9	12	–	–
2	43 y/F	Labourer	III	19	9	9	15	3	Coracoid through
3	36 y/M	Labourer	V	20	9	9	11	–	–
4	31 y/M	Shop assistant	III	17	11	10	15	5	Coracoid through
5	33 y/F	Housewife	V	19	9	9	12	–	–
6	33 y/M	Labourer	III	18	10	9	12	–	–
7	48 y/M	Labourer	III	18	10	10	18	6	Coracoid through
8	38 y/M	Labourer	V	22	11	9	20	6	Clavicular erosion
9	25 y/M	Labourer	III	18	9	10	17	3	Coracoid through
10	49 y/M	Shop assistant	IV	20	11	10	16	2	Clavicular through
11	35 y/M	Housewife	IV	20	10	9	12	–	–

1. Introduction

Acromioclavicular joint (AC jt) injuries are one of the most common injuries of the shoulder joint in the young and active patient population.¹ The incidence of traumatic AC joint separation varies from 3 to 4 per 100,000 people with 25–52% of these occurring during sporting activities.² Most acromioclavicular (AC) joint injuries can be successfully treated non-operatively; surgery is usually needed for Rockwood grade IV–VI dislocations.^{3,4} Treatment strategies to treat Rockwood grade III dislocations remain controversial and can be either conservative or surgery.² The principle is to reduce and temporarily fix the joint in place to allow healing of torn ligaments. Stabilization of acromioclavicular joint is a challenging technique with several methods described in literature from non-biological methods to biological methods.⁵ The latter is a newer technique with limited literature available. The metallic fixation materials often loosen and will usually impair shoulder joint function; therefore, pins, screws or plates must be removed 6 weeks to 12 weeks after surgery, which occasionally leads to recurrence of dislocation or subluxation.⁶ Some studies have suggested that sutures may be used to permanently replace coracoclavicular ligaments.^{7,8} Arthroscopic fixation of acromioclavicular joint is a relatively new technique with conflicting results.

The present study aimed to assess the radiological and functional results of using arthroscopy-assisted coracoclavicular flip button device (tightrope) repair for Rockwood grade III to V AC dislocations.

2. Materials and methods

A series of 15 consecutive patients were treated prospectively for acute acromioclavicular joint dislocation from February 2013 to August 2013. In all cases, a second-generation tightrope implant was inserted by the Endobutton technique joining the distal end of the clavicle and the coracoid process. Inclusion criteria were a completely acute traumatic AC jt dislocation (Rockwood grade III to V), age between 18 and 45 years and a minimum of one-year follow-up. Exclusion criteria were associated lesions, low functional demand patients and

surgery delay more than one week. We excluded 4 patients: 1 patient had associated greater tuberosity fracture, 1 patient was operated after 7 days and two patients were low demand patients. This left us with 11 patients. Data were collected and include gender, age at the time of surgery, injury mechanism, Rockwood classification and complications. Coracoclavicular distance was measured and compared to the other side (Table 1). Patients with at least one-year follow-up were included in this study.

All patients were evaluated clinically and radiologically using Constant–Murley score (Table 2). Anteroposterior radiographs were obtained for both clavicles and AC joints at preop, postop, 6 weeks and 6-month interval. Coracoclavicular distance was measured and compared to normal side. All analyses were performed using SAS statistical software (SAS 9.2, Cary, NC). Reduction of AC joint was assessed using coracoclavicular distance.

2.1. Surgical technique

The arthroscopic procedure was performed in lateral position under general anaesthesia. Three portals were used: a posterior portal, an anterolateral portal for the optical device and an operative anterosuperior portal. The glenohumeral joint was explored using posterior portal. The anterolateral portal was used to explore the lateral and upper surfaces of the coracoid, whereas the anterosuperior portal was used to introduce a radiofrequency device to clean the lateral and inferior coracoid side. A 4-mm dedicated C-ring drill guide was introduced into the anterosuperior portal and under the coracoid. A small incision of 2 mm was made to expose the distal clavicle. The guidewire was directed from the posterior site of the clavicle to the coracoid base as close as possible to the coracoid centre under arthroscopic visualization. Then, a

Table 2 – Summary of Constant–Murley score.

Constant and Murley score	No of patients (%)
Excellent	0 (0%)
Good	1 (9%)
Satisfying	8 (72%)
Poor	2 (18%)

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