Surgical Outcomes After Fixation of Acromioclavicular Joint Dislocation with Hook Plate and Coracoacromial Ligament Transfer Technique

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Abstract

BACKGROUND: Treatment of acute and chronic acromioclavicular joint dislocations is still controversial. We aimed evaluation of surgical outcomes after using the combined technique with a hook plate and transposition of the coracoacromial ligament in the treatment of acromioclavicular dislocation.

CASE PRESENTATION: During two years 4 patients (2 acute and 2 chronic cases) were operated with this technique. Three male and one female with an average 37 (26-43) years old were: three on the right and one of the left side. Rockwood classification was used. The evaluation was done according to Constant score - preoperatively, 3 months after the operation and 3 months after the titanium plate was removed.

CONCLUSION: Evaluation of the effectiveness using this combined technique show excellent result in all four patients. No surgical site infection and the favourable cosmetic result were present.

Introduction

Treatment of acute and chronic acromioclavicular joint dislocations is still controversial. Surgical treatment is indicated for fixation of complete acromioclavicular joint dislocation what means rupture of acromioclavicular and coracoclavicular ligaments [1]. Acromioclavicular (AC) joint injuries often occur in men in their third or fourth decade of life due to fall from a height, fall on an outstretched arm and sports injuries. Most of the surgical techniques involve reconstruction of the coracoclavicular ligament and transfer of the coracoacromial ligaments to improve surgical outcomes [2]. A lot of modification of the surgical techniques are described to enhance the mechanical stability of the acromioclavicular joint.

Case Presentation

Between 2015 and 2017 we operate four acromioclavicular joint dislocation gr. V according to the Rockwood classification system (Figure 1).

Three of them were male, and one was female. Mean age was 37 years old (36-39).
Two of the dislocations were acute treated – until three weeks from the injury, and two of them were chronic more than one month from the injury.

Hook plate was removed between 6-9 months to all patients. Mean follow up was an average of 12 months (11-15 m). The evaluation was done preoperatively, 3 months postoperatively and three months after removing the hook plate. The constant score was used for the evaluation of the surgical outcomes.

We use Constant score for evaluation of surgical outcomes, and we noted average result 91.5 (88-96) at three months after removal of the hook plate (Table 1).

All of the patients were satisfied with the clinical results, with favourable cosmetic appearance and with an excellent range of motion.

Table 1: Demographic results and surgical outcomes

| Sex     | age | type | Constant score |
|---------|-----|------|----------------|
| 1        | 43  | V    | 45             |
| 2        | 38  | V    | 67             |
| 3        | 40  | V    | 53             |
| 4        | 27  | V    | 72             |

We had one patient with impingement syndrome so, we remove the plate sixth month postoperatively, and one patient develops superficial wound infection which response to wound debridement and oral antibiotic administration.

Surgical techniques - Coracoacromial ligament transposition and hook plate

Patients were operating in the beach-chair position, using transversal incision over the acromioclavicular joint. We use the modifications of the original Weaver-Dunn procedure which include distal resection of the clavicle, transfer of the detached coracoacromial ligament with the addition of a hook plate to improve clinical results and surgical outcomes from the fixation.

The objective evaluation involves the range of shoulder motion, and subjective assessment includes patient satisfaction and pain score.
Discussion

The original method for the surgical treatment of acromioclavicular dislocation is the transfer of the coracoacromial ligament to the end of clavicle [1], [3], [4].

 Von Heideken et al. presented excellent surgical outcomes treating acromioclavicular joint dislocations type V using hook plate [2].

The main difference between the modifications of the original surgical technique Weaver–Dunn operation depends from placing the coracoacromial fixation subcoracoid using suture loops [5] or putting the anchors directly to the coracoid, [6]. Another described modification of what we were using-consists of the addition of a hook plate [7]. A comparative study was published by Rolf et al., between two groups of patients, one treated in the acute period and the second one in the chronic phase after unsuccessful conservative treatment. In both groups, the modified Phemister surgical technique was used. According to the results, surgical outcomes were significantly better in the group of patients which was operated in the acute period [9]. Similar results were noted from Mignani et al., comparing results between acute and delayed surgical treatment of the acromioclavicular dislocation. They use the same technique with resection of the distal clavicle and fixation with k-wires. Difference between the clinical results of the two groups was not statistically significant for acute treated injuries [10].

In conclusion, we can accept that this modification of the original Weaver-Dunn procedure with the addition of a hook plate to enhance the mechanical stability of the fixation could be an effective method for treating unstable injuries in acromioclavicular joint.

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