

Results of Fixation of Clavicle Alone in Managing Floating Shoulder

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ABSTRACT

Aim of study: A retrospective review on the outcomes of four floating shoulder, ipsilateral scapular neck and clavicular fractures, treated with open reduction and internal fixation of the clavicle alone using plate and screws.

Methods: All patients were evaluated by interview, physical examination and radiological examination at an average follow up period of 3.3 years (range: 2-4 years). Functional outcomes were rated using Rowe's score. **Results:** Radiological union of both fractures occurred at an average of 2.8 months (range: 8-12 weeks). Excellent result was seen in three cases and good in one.

Conclusion: Plating of clavicle alone restored stability of shoulder and allowed early range of motion exercises. All cases gained good and excellent function.

Keywords: Ipsilateral scapular neck and clavicular fractures, Rowe's score

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INTRODUCTION

Fracture of either clavicle or scapular neck alone is generally stable and has satisfactory results by conservative treatment. However, floating shoulder with displaced scapular neck and ipsilateral clavicle fractures is unstable. Sequelae such as drooping shoulder and frozen shoulder with limited motion may develop if treated conservatively. Surgical intervention of either fixation of clavicle alone or fixation of clavicle and scapular neck simultaneously can achieve shoulder stability and prevent these sequelae. We presented four cases of floating shoulder treated by fixation of clavicle alone.

MATERIALS AND METHODS

Between January 1994 and December 1996, four cases of floating shoulder with ipsilateral clavicular and scapular neck fractures were treated by open reduction

and internal fixation of clavicular alone using plate and screws. There were three males and one female. The mean age at injury was 40.0 years with a range of 24 to 50 years. Three fractures involved the right upper limb (dominant side) and one affected the left (non-dominant side). The mechanisms of injury included industrial accident (Workman Compensation) in one case and road traffic accident in three. Three patients were manual workers and one involved in clerical work. One patient



Fig. 1a Anteroposterior radiograph of shoulder shows ipsilateral clavicular and scapular neck fractures

Fig. 1b Postoperative radiograph of shoulder shows fixation of the clavicle using plate and screws.

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had associated ipsilateral rib fractures without pneumo- or hemothorax and the rib injuries were treated conservatively. All scapular fractures were at the neck. Three clavicular fractures were at the middle third and one at the lateral third. The surgery was carried out at an average of 36.5 hours after injury with a range of 24 to 48 hours.

The clavicular fracture was exposed through a transverse incision. The site of the fracture was dissected subperiosteally and the fracture was reduced. It was fixed with a 3.5 mm dynamic compression plate and screws. After hemostasis and insertion of a suction drain, the wound was closed in layers. The average operation time was 55.0 minutes with a range of 45 to 60 minutes.

Postoperatively, the suction drain was removed on the second day. Passive mobilization followed by active mobilization exercises was started as soon as the condition of the patient allowed. Plane antero-posterior and axillary view radiographs were taken at monthly interval. Union was defined as disappearance of the fracture line on the radiographs. Strengthening exercises were commenced once radiological union was confirmed.

All patients were evaluated at an average follow up period of 3.3 years and a range of 2 to 4 years. They were evaluated by questionnaire; physical examination and plane antero-posterior and axillary shoulder radiographs. The results were rated using Rowe shoulder score (excellent: 85-100, good: 84-70, fair: 50-69 and poor: 49 points or less).

RESULTS

All fractures showed radiological union at an average of 2.8 months with a range 2 to 3 months. At an average follow up of 3.3 years, excellent results were noted in 3 cases and good in one. The average time for return to the work was 3.5 months with a range of 3 to 4 months.

DISCUSSION

The unstable shoulder girdle or floating shoulder, a combination of a scapular neck fracture with a clavicular fracture, represents a rare and often underestimated injury. It is first described by Ganz and Noesberger in 1975. It produces an alternation in the glenohumeroacromial relationship and results in functional imbalance. Sufficient treatment permit early function is necessary to avoid a frozen shoulder as well as to treat concomitant thoracic injuries. In most cases it can be achieved by a sole osteosynthesis of the clavicular fracture. Rikli et al analyzed 12 cases of this injury treated by osteosynthesis of clavicle alone, excellent functional results occurred in nearly all cases. Herscovici et al reported that in ipsilateral clavicular and scapular neck fractures, the mechanical stability

of the suspensory structures was disrupted. The muscle forces and the weight of the arm would pull the glenoid fragment distally and anteromedially. They treated seven patients with this unusual injury with internal fixation of the fractured clavicle by a plate and screws; all achieved an excellent functional result without deformity. Fixation of the clavicle would prevent further migration of the glenoid and correct the shoulder imbalance.

Leung et al treated 15 patients with this injury with fixation of both clavicular and scapular fractures; all but one patient had good or excellent functional result at an average follow up of 25 months and range of 14 to 47 months. All fractures healed at an average of 8 weeks postoperatively. Complications from concomitant fractures of the ribs were treated uneventfully.

In this study, fixation of the clavicle alone using an anterior incision was used to treat this unstable shoulder injury. Simultaneous fixation of the scapula was not performed because of the following reasons. Firstly, previous studies have shown that fixation of the clavicle without fixation of the scapular neck leads to excellent results. Secondly, fixation of the scapular fracture needs a second posterior approach that will prolong the operating time, cause additional trauma to the scapular musculature and more blood loss. Pain from both anterior and posterior wounds may interfere with the postoperative rehabilitation program.

In this series, union of both fractures without malunion occurred at an average of 2.8 months. At latest follow up, all cases achieved excellent or good result without sequelae. They returned to previous job at an average of 3.5 months.

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