Functional Outcome After Open Reduction Internal Fixation (ORIF) Clavicle Using 1/3 Semitubular Plate

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ABSTRACT

Objective: To evaluate the functional outcome of ORIF clavicle using DASH score

Methods: This is a retrospective study of prospectively collected data. Patients presented to the Orthopedic Surgery department of TO Clinic from June 2015 till June 2017 with clavicle fracture investigated by clinical and radiological examination who meet the inclusion criteria were treated with open reduction and internal fixation using 1/3 semitubular plate. All patients were operated under general anesthesia. Polysling was applied postoperatively for 4 weeks. Shoulder range of motion was started from 3rd week postoperatively. 6 months after surgery all patients were given a questionnaire to assess their postoperative results using DASH score

Results: 24 patients were enrolled in this paper and more than 90 percent of patients were males. 1 patient didn't complete the study, as he didn't come in the followup. Right clavicle fracture was seen in 20(83.33%) patients while left clavicle fracture was seen in 8(33.33%) patients. The dominating mechanism of injury was fall on shoulder, 22 patients (91.6%). Most of the patients were aged below 40 years, (75%) 18 patients. The average DASH score of patients was 88 (fair to good) .One patients (4.1%) had superficial infection, which resolved with oral antibiotics. Two patients (8.3%) had another fall after surgery, which required redo ORIF. One patient (4.1%) had prominent implant pain, which resolved with pain killers.

Conclusions: We conclude that ORIF Clavicle using 1/3 semitubular plate is a reliable method for clavicle fixation achieving fair to good functional outcome at 6 months after surgery

Keywords: ORIF, 1/3 semitubular plate DASH score

INTRODUCTION

Clavicle is the most frequently injured bone of the body constituting about 2.6% of all fractures [1]. Middle third of the clavicle is mostly vulnerable to fracture reaching upto 70-80% of cases [2]. Management options for clavicle fracture are ORIF, which gives good results especially in displaced fractures [3]. Multiple implants are available for clavicle fixation, plating is considered to be gold standard [4]. The complications of operative intervention include malunion, nonunion, bleeding, infection, and pneumothorax for which implant removal is being done [5]. Controversy however remains on the best site for plating a clavicle fracture. The two sites commonly preferred for plating are superior and anterior. Both surfaces causes implant prominence and may lead to removal of implant request by the patient [6]. Benefits of anterioinferior plating include usage of long screws [7], avoidance of neurovascular complications and fewer implant related patients complaints [8]. Iatrogenic injury to neurovascular structure can occur regardless of the site of plating [9].

As Pakistan is a third world country where the cost of hospitalization has to be borne by the patient, implant cost is of particular importance. Most of the locking plates available are too costly to be used. The purpose of this study is to evaluate the outcome of using a semitubular plate, which is practically pretty cheap.

METHODS

24 patients from age 18 to 50 yrs. were included in our study with displaced clavicle fracture from June 2015 till June 2017. All patients had radiologically proven

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displaced clavicle fracture. Surgery was done under general anaesthesia. A single surgeon having more than 5 years experience did all surgeries. Mostly 6-8 hole 1/3 semitubular plate was applied on the superior surface of the clavicle, wound was closed after securing haemostasis. Poly arm sling was applied postoperatively. Patient was discharged on the 4th postoperative day. Pendulum exercises were started from 2nd week. Stitches were removed after 2 weeks. Physiotherapy was started after 3 weeks. Patients were asked to follow-up at 2nd, 3rd week, 6weeks, 3 months and 6 months postoperatively to assess radiological union. 6 months after surgery all patients were given quick DASH questionnaire [10] to assess surgery results.

Patients with displaced clavicle fracture, Age more than 18 years less than 50yr, Segmental clavicle fracture, Open clavicle fracture and Cosmetic reason were included.

History of previous surgery in the affected side of the shoulder, Ipsilateral shoulder girdle injury, Associated fractures and Diabetes mellitus associated adhesive capsulitis were excluded

Dash Score

Score	Interpretation
98-100	Excellent
93-97	Good to excellent
82-92	Fair to good
66-81	Fair
<= 65	Poor

RESULTS

24 patients were enrolled in this paper and more than 90 percent of patients were males. 1 patient didn't complete the study and was lost in follow up. Right clavicle fracture was seen in 20(83.33%) patients while left clavicle fracture was seen in 8(33.33%) patients.

Table-1: Average age of patient

Age in years	%
> 40	25
< 40	75

Table-3: Mechanism of Injury

Cause of fracture	Number of patients	%
RTA	04	16.66
Fall on shoulder	20	83.33

The dominating mechanism of injury was fall on shoulder, 22 patients (91.6%). Most of the patients were aged below 40 years, (75%) 18 patients. The average DASH score of patients was 88 (fair to good). One patient (4.1%) had superficial infection which resolved with oral antibiotics. Two patients (8.3%) had another fall after surgery, which required redo ORIF.

Figure 1: clavicle fracture

Figure 2: Postoperative x-rays after ORIF clavicle

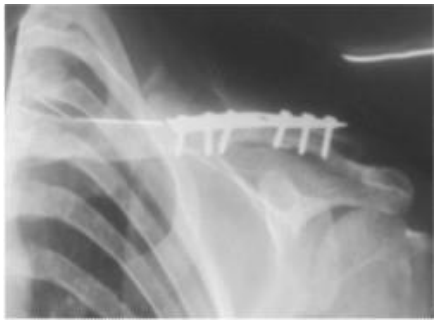

Figure 3: 3 months postoperative x rays after surgery

Figure 4: Range of motion 3 months after surgery

DISCUSSION

Most of the clavicle fractures unite with conservative methods; commonly employed technique includes

figure of eight dressing [11]. None of these conservative methods actually reduce the fracture. Compared to Neers nonunion rate of 1 % recent evidence points to an increased nonunion rate especially in midshaft clavicle fractures when treated conservatively [12]. Nowak et al. showed that in 208 patients 10 years after conservative treatment 96 patients still had symptoms while only 15 patients had nonunion [13]. Anderson in 2003 had showed good functional outcome and low complication rate in 13 patients with lateral clavicle fractures treated with LCP [14]. RCT conducted by the Canadian orthopedic society showed good functional outcome in early plate fixation of displaced midclavicular fractures and decreased nonunion and malunion rates [15]. Another study showed poor functional outcome after conservative treatment of displaced clavicle fractures [16].

There is limited literature available, which shows that 1/3 semitubular plate can be used for clavicle fracture producing good functional outcome with minimum complications. Compared to LCP the cost of 1/3 semitubular plate is minimum so financial restrains can be avoided in our country as most of the important factor in our society for negligence in trauma is financial constrain.

CONCLUSION

In conclusion, we state that ORIF clavicle using 1/3 semitubular plate can be used in selected patients with clavicle fractures producing good results with minimum complication rates.

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