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## Operative versus conservative treatment in displaced mid shaft fractures of clavicle: A retrospective comparative study

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### Abstract

**Background:** Clavicle fractures are common, with an overall incidence of 36.5 – 64 per 100,000 people every year. Traditionally, midshaft clavicle fractures have been treated nonoperatively. Recently, there has been increasing interest in the operative treatment and plate fixation or intramedullary nailing is often the treatment modality of choice. Numerous clinical studies have been published to compare surgical and conservative treatments. The best treatment for displaced midshaft clavicle fractures remains a topic of debate. So We sought to compare patient-oriented outcome and complication rates following nonoperative treatment and those after operative treatment of displaced midshaft clavicular fractures.

**Objectives:** To compare functional outcome and complication rates following nonoperative treatment and those after operative treatment of displaced midshaft clavicular fractures.

**Materials and Methods:** 60 patients with a displaced midshaft fracture of the clavicle who were presented to RL Jalappa Hospital from June 2015 to October 2016 and either treated by conservative or operative methods of treatment and who were in regular follow up are selected. Functional assessment was done at 6 weeks, 3 months and 6 months with use of the Disabilities of the Arm, Shoulder and Hand (DASH) and Constant scores Complications, if any will be recorded.

**Results:** DASH Scores and Constant scores were significantly better in the operative group compared to the conservative group at all time points.

**Conclusion:** Operative treatment resulted in early return to function compared to conservative treatment but at the cost if complications like infection and other hardware related problems.

**Keywords:** Clavicle fractures, Operative treatment, Conservative treatment

### 1. Introduction

Clavicle fractures are common, with an overall incidence of 36.5 – 64 per 100,000 people every year [1, 2]. Clavicle fractures have been traditionally treated nonoperatively [3]. The clavicle have medial and lateral flat expanses which is linked by a tubular middle. This central transitional area is weak in clavicular structure. Therefore, middle third fractures are more common in clavicle fractures. The non-union or mal-union rates in displaced midshaft clavicle fractures after conservative treatment is higher than previously presumed. Recently, there has been increasing interest in the operative treatment and plate fixation or intramedullary nailing is often the treatment modality of choice [4]. Numerous clinical studies, including many prospective, randomized controlled trials (RCTs), have been published to compare surgical and conservative treatments [5-9]. The best treatment for displaced midshaft clavicle fractures remains a topic of debate [10]. So We sought to compare patient-oriented outcome and complication rates following nonoperative treatment and those after operative treatment of displaced midshaft clavicular fractures.

### 2. Materials and Methods

60 patients with a displaced midshaft fracture of the clavicle who were presented to RL Jalappa Hospital from June 2015 to October 2016 and either treated by conservative or operative methods of treatment and who were in regular follow are selected. Patients who were lost to follow-up after initial injury films and those whose radiographs were unavailable

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were excluded from the study. Functional assessment was done at 6 weeks, 3 months and 6 months with use of the Disabilities of the Arm, Shoulder and Hand (DASH) and Constant scores Complications, if any will be recorded.

In operative group, general anaesthesia was given for all patients. All procedures were performed by one of the orthopaedic consultants. The fracture was exposed through a standard curvilinear incision. Locking plate was applied to the superior surface of the bone in all cases of operative group. Shoulder arm pouch was given to all patients postoperatively. Elbow and wrist range of motion exercises were started on first postoperative day. Shoulder pendulum exercises are started on fifth postoperative day.

In the non-operative group, the arm was immobilized in a sling for 6 weeks and active mobilization above the horizontal was commenced after 6 weeks.

### 2.1 Inclusion Criteria

Age more than 18 years

All displaced middle third clavicle fractures

### 2.2 Exclusion Criteria

Pathological fractures

### 3. Results

Among 60 patients of midshaft displaced clavicle fractures, 30 patients were operated and 30 patients were managed conservatively. The mean age in both groups was comparable. Out of 30 patients treated surgically, 26 fractures united at an average of 14 weeks (Figures 1, 2 & 3). 2 patients had delayed union, one patient had implant loosening with backout of screws (Figure 4) for which plate was removed and replating done. One patient had infection with plate exposed for which implant removed. The average time for fracture healing is better in operative group ( $14.2 \pm 0.6$  weeks) compared to nonoperative group ( $22.6 \pm 0.7$  weeks). Dash scores and Constant Scores were significantly better in the operative group. Constant Score was 93.56 in operative group and 82.65 in nonoperative group. There were 4 nonunions in nonoperative group. Patient satisfaction levels were more in operative group than in nonoperative group.



Fig 1: Preop Xray

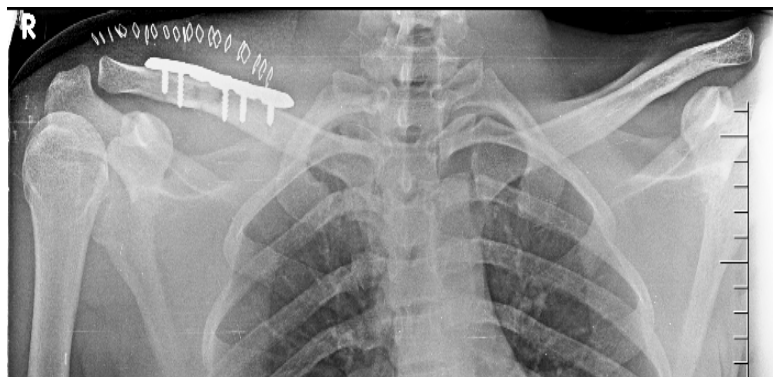


Fig 2: Immediate Postoperative Xray

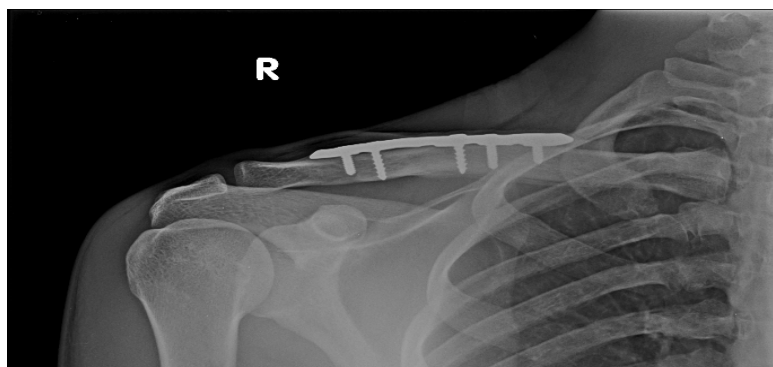


Fig 3: Follow up Xray showing Union

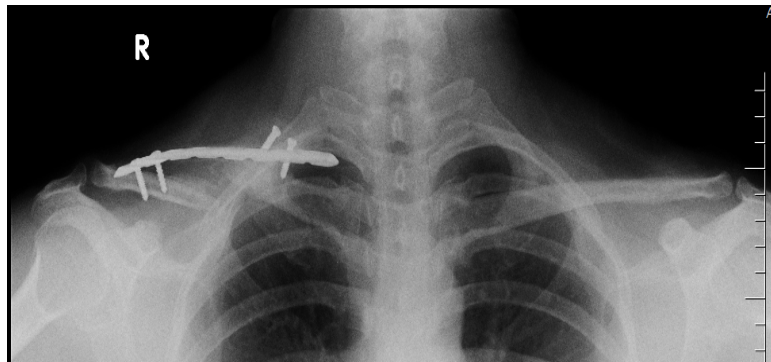


Fig 4

#### 4. Discussion

Clavicle fractures are usually treated conservatively. The concept in the 1960's, was that surgical treatment of displaced midshaft clavicle fracture should be avoided because of the high rate of union with non-operative treatment, high rate of failure with operative treatment and high risk of complications due to the close proximity of the underlying neurovascular structures [11, 12]. However, the treatment of displaced midshaft clavicle fractures changed over the last few decades because of complications with conservative management like malunion, nonunion, persistent pain<sup>13</sup>. Surgical treatment by plate fixation has fewer nonunions and better functional outcome compared to conservative treatment, as per Robinson CM [14]. Hardware prominence is one of the known complication which can be reduced by precontouring of the plate<sup>15</sup>. In our study, it was observed that rate of complication was higher in surgically treated patients with minor complications which is comparable to the study done by Judd *et al* [16]. Delayed union was observed in two patients and one patient had implant loosening with backout of screws and one patient had infection with exposed plate for which plate removal was done. According to a study done by Witzel *et al*, 80% of surgically treated patients resumed athletic activity while only 55% of conservatively treated patients resumed athletic activity [17]. The rate of nonunion and malunion are higher in nonoperative group compared to operative group in our present study.

#### 5. Conclusion

Operative treatment resulted in early return to function compared to conservative treatment but at the cost if complications like infection and other hardware related problems.

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