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Original Research

Rockwood Pins And Dynamic Compression Plating In Management Of Clavicular Fractures

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ABSTRACT

Background: To compare Rockwood pins and dynamic compression plating in management of displaced and shortened mid-clavicle fractures.

Materials and Methods: Clavicular fractures patients were divided into two groups of 35 each. Group I patients were treated with Rockwood clavicle pins and group II patients were treated with dynamic compression plate. Parameters such as mode of injury, and the functional outcome was evaluated using the American Shoulder and Elbow Surgeons (ASES) score and Constant score**.**

Results: There were 20 male and 15 females in group I and 22 male and 13 females in group II. The mode of injury was fall seen in 7 in group I and 5 in group II followed by road traffic accident seen in 20 in group I and 21 in group II and physical violence in 8 in group I and 9 in group II. A significant difference in both groups was observed (P< 0.05). ASES score subjective pain value was 9.7 in group I and 8.7 in group II, activity score was 28.4 in group I and 27.3 in group II. A significant difference was seen in both groups (P< 0.05). ASES score objective range of motion was 41.9 degree in group I and 40.2 degree in group II, strength was 20.9 in group I and 20.1 in group II. A significant difference was seen in both groups (P< 0.05).

Conclusion: Rockwood clavicle pins were superior as compared to dynamic compression plate in patients with displaced and shortened mid-clavicle fractures.

Keywords: Clavicle, Dynamic compression plate, Rockwood clavicle pins.

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INTRODUCTION

Clavicle fractures are common injuries, accounting for 8-15% of all fractures in children and adults. The reason can be direct trauma, falls on the shoulder, or falls onto an outstretched arm.[1] Clavicle fractures occur at three locations mid-shaft clavicle fractures which is the most common one seen in 85% of all cases, lateral clavicle fractures seen in 10-15% which is further of type 1 – lateral to the coraco-clavicular (CC) ligaments, type 2 – medial to the CC ligaments and type 3 – intra-articular fracture extending into the acromioclavicular (AC) joint and medial clavicle fractures seen less than 5% of cases which shows anterior displacement and posterior displacement. Numerous studies comparing different treatment modalities of clavicular fractures have been conducted.[2,3]

Allman classification of clavicular fractures is the most commonly used and is divided into 3 groups such as middle-third fractures, lateral-third fractures and medial- third fractures.[4] The

common findings of patients with clavicle fracture are pain over the affected clavicle and deformity depending on the extent of displacement. Dyspnea, weakness, paresthesia or paralysis and difficulty swallowing or speaking due to from injury to trachea or oesophagus in medial clavicle fractures with displacement are common symptoms.[5]
Treatment modalities of clavicle fracture can be either conservative or non- conservative.[6] In conservative modality various methods are available such as in the form of brace, figure of 8 bandage, arm sling or operative treatment in the form of open reduction and internal fixation with screws and plate construct using locking, non- locking or combination of both.[7] The present study compared Rockwood pins and dynamic compression plating in management of clavicular fractures.

MATERIALS & METHODS

A sum total of seventy patients of displaced and shortened mid-clavicle fractures were included in the study. All patients their written consent for the participation in the study.
Demographic data such as name, age, sex etc. were recorded in case history proforma. Patients were divided into two groups of 35 each. Group I patients were treated with Rockwood clavicle pins and group II patients were treated with dynamic compression plate. Parameters such as mode of injury, and the functional outcome was evaluated using the American Shoulder and Elbow Surgeons (ASES) score and Constant score. Results of the study were assessed with SPSS version 16. Descriptive analysis was done using Mann Whitney U test. Level of significance was below 0.05.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II
Method used	Rockwood clavicle pins	Dynamic compression plate
Male: Female	20:15	22:13

There were 20 male and 15 females in group I and 22 male and 13 females in group II (Table I).

Table II Mode of injury

Mode	Group I	Group II	P value
Fall	7	5	0.05
Road traffic accident	20	21	
Physical violence	8	9	

The mode of injury was fall seen in 7 in group I and 5 in group II followed by road traffic accident seen in 20 in group I and 21 in group II and physical violence in 8 in group I and 9 in group II. A significant difference in both groups was observed ($P< 0.05$) (Table II).

Table III Comparison of ASES score (Subjective) in both groups

ASES score (Subjective)	Group A	Group B	P value
Pain	9.7	8.7	0.81
Activity	28.4	27.3	0.05

ASES score subjective pain value was 9.7 in group I and 8.7 in group II, activity score was 28.4 in group I and 27.3 in group II. A significant difference was seen in both groups (P< 0.05) (Table III).

Table IV Comparison of ASES score (Objective) in both groups

ASES score (Objective)	Group A	Group B	P value
Range of motion	41.9	40.2	0.03
Strength	20.9	20.1	0.05

ASES score objective range of motion was 41.9 degree in group I and 40.2 degree in group II, strength was 20.9 in group I and 20.1 in group II. A significant difference was seen in both groups (P< 0.05) (Table IV).

DISCUSSION

Clavicular fracture is one of the most common bone fractures which accounts approximately 2.6%-4% of adult fractures and 35% of injuries to the shoulder girdle.[8,9] It is observed that 70%- 80% occur in the mid third. In young adults and in athletics displaced and shortened fractures of the mid third of the clavicle are common. The most common cause of clavicle fractures are road traffic accidents or sports injuries.[10] The clavicle is an S-shaped bone that acts as a strut between the sternum and the glenohumeral joint. It also has a suspensory function to the shoulder girdle.[11,12] The shoulder hangs from the clavicle by the coracoclavicular ligament. The present study compared Rockwood pins and dynamic compression plating in management of clavicular fractures.

We observed that there were 20 male and 15 females in group I and 22 male and 13 females in group II. Phanswal et al[13] enrolled 20 patients who were operated and 20 were managed conservatively. The average union time in operative group was 7.8 weeks and in conservative group was 9.4 weeks. 1 patient in conservative group had non-union. Mal-union was present in conservative group. Out of these patients with mal-union 1 had poor functional outcome, 3 had good to excellent outcome and 3 had satisfactory functional outcome. 4 of these had restricted movements terminally and 2 had pain on movement.

We found that the mode of injury was fall seen in 7 in group I and 5 in group II followed by road traffic accident seen in 20 in group I and 21 in group II and physical violence in 8 in group I and 9 in group II. Dugar et al[14] studied 30 patients of clavicle fractures who were divided into operative treatment or non-operative group. It was found that the mean follow-up of both groups were 12.56 months. DASH scores were significantly improved in the operative fixation group. The mean time to radiographic union was 15.73 weeks in the operative group and 27.46 weeks in the non-operative group. 7 patients in the non-operative group and none in the operative group revealed symptomatic malunion. Hardware-irritation and incisional numbness 1 each was complications in the operative group. The patients in the operative group were more satisfied with the appearance of the shoulder and with the shoulder in general than were those in the non-operative group. There were no differences between the two groups with respect to patient age, sex, side of injury or associated injuries.

In our study, ASES score subjective pain value was 9.7 in group I and 8.7 in group II, activity score was 28.4 in group I and 27.3 in group II. ASES score objective range of motion was 41.9 degree in group I and 40.2 degree in group II, strength was 20.9 in group I and 20.1 in group II. Mohan et al[15] compared 60 cases of displaced and shortened mid-clavicle fractures. Patients were divided into two groups. Group A patients were treated with Rockwood clavicle pins and

group B patients were treated with low-contact dynamic compression plate. Outcome of treatment was compared. It was found that the mode of injury was road traffic accident seen in 14 in group A and 15 in group B followed by physical violence in 10 in group A and 8 in group B patients and fall seen in 6 in group A and 7 in group B. ASES score subjective pain value was 9.8 in group A and 9.0 in group B, activity score was 29.7 in group A and 28.1 in group B, ASES core objective range of motion was 41.1 degree in group A and 40.5 degree in group B, strength was 20.3 in group A and 20.0 in group B.

CONCLUSION

Rockwood clavicle pins were superior as compared to dynamic compression plate in patients with displaced and shortened mid-clavicle fractures.

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