Original Article

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A Comparative Analysis of Plating versus Clavicle Pin in the Management of Clavicle Fracture

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Abstract

To compare plating versus clavicle pin in the management of clavicle fracture. Eighty- four adult patient in age ranged 24- 60 years of either gender with mid-shaft clavicle fracture were randomly divided into 2 groups of 42 each. Group I patients were treated with clavicle pins and group II with plating. Parameters such as ASES score subjective, objective, constant score subjective, objective and complications of each method was recorded. There were 22 males and 20 females in group I and 24 males and 18 females in group II. ASES score subjective pain value found to be 9.8 in group I and 9.0 in group II. Activity score found to be 29.7 in group I and 28.3 in group II. ASES score objective range of motion found to be 40 in group I and 39.2 in group II. Strength was 20 each in both groups. Constant score subjective was 34.4 in group I and 32.1 in group II. Constant score objective was 63.5 in group I and 61.9 in group II. A significant difference was observed (P< 0.05). Result of the study demonstrated that clavicle pinning resulted in excellent functional outcomes.

Keywords: Clavicle pinning, clavicle fracture, plating.

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Introduction

Clavicle fracture is seen in approximately 2.6% of all bone fractures.[1] It is commonly encountered fracture around the shoulder girdle. It is common in 2nd and 3rd decade of life and males being highly injured. In women, its incidence is bimodal, with peak incidence in young and elderly.[2,3]

Athletic and young people usually encounter displaced and shortened fractures of the mid third of the clavicle. Road traffic accidents (RTA) and sports injuries are the leading cause resulting in clavicle fracture.[4] Management of clavicle fracture depends on type of injury. Operative and non-operative methods are two ways of treatment. Operative fixation is needed in patients with displaced and shortened mid-shaft fractures of the clavicle whereas closed treatment for displaced middle-third fractures have poor outcome of the treatrment.[5] Among numerous methods of fixation of clavicle, Kirschner wires, plates Steinman pins, external fixators and even plaster constructs are common one. It is evident that intramedullary devices being smooth in structure lacked compression at the fracture site.[6]

Clavicle brace and an arm sling are examples of non-operative method. It is non-invasive and there is absence of exposure to anaesthesia.[7] It is observed that non-operative methods are linked with danger of non-union, residual deformity and high rate of patient dissatisfaction are common. Most clavicular fractures are managed with closed reduction and heal effectively with no complications.[8] Considering this, we selected present study to compare plating versus clavicle pin in the management of clavicle fracture.

Subjects and Methods

A total of eighty- four adult patient in age ranged 24- 60 years of either gender with mid-shaft clavicle fracture were selected. All were approved to participate in the study with their valid written consent.

Demographic profile of each patient was recorded followed by complete physical examination. Patients were assigned into 2 groups. Each group had 42 patients. Group I patients were treated with clavicle pins and group II with plating. Parameters such as ASES score subjective, objective, constant score subjective, objective and complications of each method was recorded. Statistical analysis using Mann Whitney U test was performed. Level of significance was set below 0.05.

Results

Table 1: Patients distribution

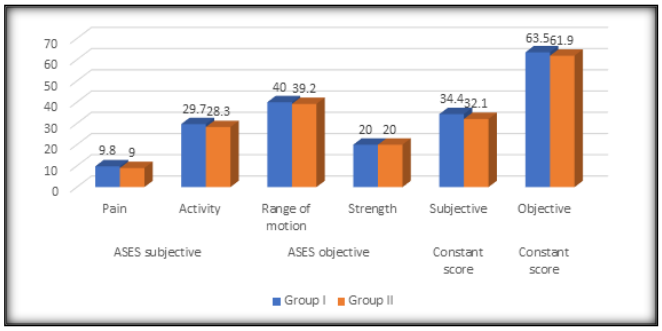
Groups	Group I	Group II
Method	Clavicle pin	Plating
M:F	22:20	24:18

Group I comprised of 22 males and 20 females and group II had 24 males and 18 females [Table 1].

Table 2: Comparison of parameters

Parameters	Variables	Group I	Group II	P value
ASES subjective	Pain	9.8	9.0	<0.05
	Activity	29.7	28.3	<0.05
ASES objective	Range of motion	40	39.2	<0.05
	Strength	20	20	<0.05
Constant score	Subjective	34.4	32.1	<0.05
Constant score	Objective	63.5	61.9	<0.05

ASES score subjective pain value found to be 9.8 in group I and 9.0 in group II. Activity score found to be 29.7 in group I and 28.3 in group II. ASES score objective range of motion found to be 40 in group I and 39.2 in group II. Strength was 20 each in both groups. Constant score subjective was 34.4 in group I and 32.1 in group II. Constant score objective was 63.5 in group I and 61.9 in group II. A significant difference was observed (P< 0.05) [Table 2, graph 1].



Graph 1: ?

Discussion

Mid- clavicle shaft fractures usually unite with any method of immobilization. Therefore, closed methods was recommended and preferred one for the management of clavicle fractures.[9,10] Whereas researches have resulted suboptimal outcomes and significant non-union rates when conservative methods were used.[11] Functional impairment of the shoulder and appearance of non-cosmetic bump at the base of the neck were two limitation of conservative methods that is because of clavicle shortening and exuberant callus formation.[12] It is advisable to restore normal length and alignment by surgical methods. Other surgical modalities have shown good outcome with high union rates and minimum complication rates by primary fixation of the displaced fracture.[13] This study compared plating versus clavicle pin in the management of clavicle fracture.

We observed that there were 22 males and 20 females in group I and 24 males and 18 females in group II. Naveen et al.[14] in their study on sixty patients who were assigned in two groups of 30 each. Group 1 patients were treated with figure-of-eight bandage and a sling and group II patients were treated by plate fixation. It was found that there was relatively shorter union time in patients treated surgically. There was favorable constant shoulder score in this group too. Both the groups showed no difference in complication rate and functional outcome. Results showed that outcome was better with those managed surgically.

We observed that ASES score subjective pain value found to be 9.8 in group I and 9.0 in group II. Activity score found to be 29.7 in group I and 28.3 in group II. ASES score objective range of motion found to be 40 in group I and 39.2 in group II. Strength was 20 each in both groups. Constant score subjective was 34.4 in group I and 32.1 in group II. Constant score objective was 63.5 in group I and 61.9 in group II. Thyagarajan et al.[15] conducted a study on 51 cases of mid shaft clavicle fractures. Method of treatment was intramedullary stabilization using clavicle pins, open reduction and internal fixation and sling in group I, II and III respectively. Group 1 patients showed union within 8-12 weeks. 6 patients in group 2 showed scar linked with pain and 2 cases showed prominent metal work and discomfort and 3 cases had non- union and 1 had symptomatic malunion in group 3. Authors suggested that displaced and shortened midshaft clavicle fractures require operative fixation and the techniques of clavicle pinning resulted in less complications, short hospital stay and good functional outcome.

Dugar et al.[16] compared non-operative and operative treatment of clavicular fractures management in 30 patients. The operative fixation group had more improvement in DASH scores. There was 27.46 weeks of radiographic union time was observed with non-operative group and 15.73 weeks in the operative group. Symptomatic malunion seen in 7 patients in the non-operative group and nil in the operative group. 1 patient of hardware-irritation and 1 case of incisional numbness was seen in operative group. Operative group showed more satisfaction with the appearance of the shoulder and with the shoulder in general than were those in the non-operative group. Factors such as age of patient, gender, side of injury or associated injuries showed no differences between both groups. Operative fixation of AO type B2 clavicular fracture results in improved functional outcome and early union compared with non-operative treatment. Authors suggested primary operative fixation of completely displaced mid shaft clavicular fractures as treatment of choice.

The limitation of the study is small sample size and short follow up.

Conclusion

Result of the study demonstrated that clavicle pinning resulted in excellent functional outcomes.

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