

# Clavicle Fracture Treatment: Operative versus Non-Operative Procedure: A Retrospective Analysis at Tertiary Centre.

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## ABSTRACT

**Background:** In past majority of clavicle fractures have been treated non operatively. However, many recent studies have concentrated on the results of operative treatment. We assessed and compared the outcomes of operative versus non operatively treatment for acute clavicle fractures in adults at tertiary care hospital. Study Protocol: A retrospective study was conducted in the department of orthopedics surgery in a tertiary care hospital. **Methods:** Data of all the patients with fracture of clavicle who were admitted in our centre over a period of 3 years were recorded from case files, casualty admission register and operative records. A total of 37 patients were included in our study and efficacy of operative versus non operative management of clavicle fracture was done taking into account of fracture union, range of motion (ROM), return to previous activity, and complications. **Results:** The patients were assessed by taking into consideration about fracture union, range of motion (ROM), return to previous activity, and complications. The results were analyzed and were compared with standard accepted studies in literature. **Conclusion:** There is no significant difference between operative and non operative treatment in long term follow up. Initially in operative group, early fracture union, early rehabilitation, early gaining of range of movement, early return to work is the advantage but in long term as per patient satisfaction there is no significant difference in operative and non operative group.

**Keywords:** Clavicle fracture, operative treatment, non operative treatment.

## INTRODUCTION

Around 2% to 5% of all fractures in adults and 10% to 15% in children involve the clavicle. The incidence of this type of fracture in the adolescent and adult population is reportedly 29 to 64 per 100,000 person's annually.<sup>[1]</sup>

Aged less than 30 years and elderly patients aged over 70 years appear to be two distinct age groups at higher risk for clavicle fractures.<sup>[2]</sup>

Clavicle fractures are almost always the result of trauma and occur most often in the young male population.<sup>[3]</sup> Both operative and non operative has been done for this fracture. Traditionally, nonsurgical management has been favored as the initial treatment modality for most clavicle fractures because of the high nonunion rates reported after operative treatment.<sup>[4]</sup>

Recent evidence suggests that specific subsets of patients may be at high risk for nonunion, shoulder dysfunction, or residual pain after nonsurgical management.<sup>[5,6]</sup> In this subset of patients, acute surgical intervention may minimize suboptimal outcomes. Also, surgical intervention may be required in cases of neurovascular compromise or significant fracture displacement.

Delayed union and nonunion were more common in patients, who were treated nonoperatively than in those treated operatively,

Patients treated operatively have slightly better function and less disability than those treated non operatively at short follow-up, but then the effectiveness diminishes and is weak at 6 months. The different operative techniques may not differ in effectiveness or in adverse effects, but the evidence is very limited or conflicting. Surgery could be considered for active patients who require recovery to the previous level of activity in the shortest possible time.

## MATERIALS AND METHODS

This study consists of all the patients admitted to our centre for treatment of fracture of clavicle. The

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study was conducted over a period of 3 years. Data of all the patients of clavicle fracture were extracted from case records, casualty admission register and operation records. Patients of clavicle fracture that were admitted and treated during 3-year duration either operatively or non-operatively were followed as per their address and phone numbers documented on the admission file and were called for follow up. Follow up of more than 6 months upto 3 years since surgery were taken. Efficacy of operative versus non operative management of clavicle fracture was done taking into account of fracture union, range of motion (ROM), and return to previous activity, complications and cosmesis.

## RESULTS

Of the total 67 patients, 30 patients were treated operatively and 37 patients non operatively. In our study there were total 35 males and 32 skeletally mature female patients. Among operative patient 26 were male and 9 were female and among non-operative 11 were male and 21 were female. Incidence of injury to right clavicle was more as compared to left side. Road traffic accident was common mode of injury seen in 29 patients followed by fall on shoulder seen in 18 patients.

We observed that short term results in terms of union, early rehabilitation, range of motion and return to previous work were better in operative group but in long term no significant difference was noted between both the groups.

The subjective scores improved during initial follow up when patients were subjected to active/assisted active mobilization exercise.

In our study out of 30 patients in operative group 23 patients that is 77% and in nonoperative group 25 patients out of 37 patients that is 68% had excellent results having no pain or limitation of function and full range of movements in long term follow up.

4 patients that is 13% in operative and 7 patients that is 18% in nonoperative group had occasional pain during exercise and painful terminal abduction.

No further major surgery was required in operative patients except for implant removal in 5 patients. In 2 patients wound dehiscence was present in initial stage that was treated by debridement, dressing and antibiotic which further healed without any complication. No major complications were noted.

Three patients complained of pain and irritation of skin due to wires in early post operative period, but gradually over a course of time they were also relieved with healing and fibrosis of overlying subcutaneous tissues.

There was early achievement of good Range of motion, early return to previous work in operative

group but in long term follow up there was no significant difference in both operative and non-operative group.

## DISCUSSION

Studies in literature confirm that the majority of clavicular fractures heal with nonoperative treatment. However operative management has a significantly lower rate of nonunion.<sup>[7]</sup> Patients who underwent operative treatment had better short term functional outcomes. The cost of treatment was significantly greater for patients undergoing operative treatment as compared to those who were managed conservatively.

Numerous clinical studies, including many prospective, randomized controlled trials (RCTs), have been published to compare surgical and conservative treatments.<sup>[10]</sup> On the basis of the proliferation of clinical studies, multiple authors have conducted systematic reviews and meta-analyses comparing surgical and conservative treatments.<sup>8</sup> However, the results of the overlapping meta-analyses have been discordant in their findings regarding the postoperative outcomes. For example, a meta-analysis by Kong et al showed surgical treatment leads to a higher risk of postoperative complications.<sup>[11]</sup>

McKee et al and Xu et al concluded that both operative and conservative treatments can achieve a similar incidence of complications.<sup>[12,13]</sup>

Lenza et al concluded that the evidence is insufficient to indicate whether surgical or conservative treatment is best for treating displaced midshaft clavicular fractures. Treatment should be individualized, with careful consideration of the relative advantages and disadvantages of each intervention and of patient preferences.<sup>[8]</sup>

Robinson et al performed a multicenter RCT involving 200 patients and do not support the routine use of primary surgical fixation for displaced midshaft clavicular fractures in adults.<sup>[5]</sup> Robinson et al found that open reduction and plate fixation provides a lower rate of nonunion and a better functional outcome,<sup>[5]</sup> but increased implant-related complications.<sup>[9]</sup> When comparing with nonoperative treatment, routine primary surgical treatment not only exposed an unacceptably high number of patients to the risks of surgery, but also increased economic burden of hospital costs.<sup>[10]</sup> They think treatment should be chosen based on an individual patient, after consideration of expectations of treatment, each patient's age, and activity level.<sup>[9]</sup>

There is no significant difference between operative and non operative treatment in long term follow up. A policy of routine operative treatment carries an increased economic burden of hospital costs as compared to non operative treatment.<sup>[10]</sup>

## CONCLUSION

There is no significant difference between operative and non operative treatment in long term follow up. Initially in operative group, early fracture union, early rehabilitation, early gaining of range of movement, early return to work is the advantage but in long term as per patient satisfaction there is no significant difference in operative and non operative group.

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