



## EVALUATION OF DISPLACED COMMINUTED FRACTURE CLAVICLE WITH PLATTING.

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### ABSTRACT

**Aims and objectives:** To study the technique of plating in displaced comminuted middle third clavicular fractures. To evaluate the results of this technique. To compare our results with those in the literature.

**Material and methods:** The study was carried out in Smt Kashibai Naval Medical College, Narhe, Pune. 30 patients both male and female chosen from age group 18 to 60 yrs. Displaced comminuted fractures of clavicle Robinsons type 2B1,2,3 and 3B2. Patients were evaluated using Constant and Murley scoring system. Data was analysed under headings like; age distribution, sex ratio; type of fracture, duration of union, functional assessment, complication.

**Results:** In our study majority of the fractures united between 8 to 12 weeks i.e. 26 patients. In 4 patients there was delay in union as there was a displaced butterfly fragment and some comminution. They finally united with the main fragment at the end of 14 weeks. There was no non union and there was excellent functional outcome.

**Conclusion:** Clavicle fractures are usually treated conservatively but there are specific indications for which operative treatment is needed like comminuted, displaced middle third clavicle fractures. All the fractures united and there was no non union. For displaced, comminuted middle third fracture fixation and early mobilization gave excellent results.

### KEYWORDS : Displaced Comminuted Fracture Clavicle

#### INTRODUCTION:

A FRACTURE OF THE CLAVICLE HAS BEEN GREATLY UNDERRATED IN RESPECT TO PAIN AND DISABILITY.....  
"THE USUAL OR ROUTINE TREATMENT IS PERHAPS FAR SHORT OF SATISFYING OR RELIEVING THERAPY"  
- CARTER R ROWE, 1968.

Clavicle fractures is a common traumatic injury around the shoulder due to their subcutaneous position, it is caused by either low or high energy impact. Fractures of the clavicle accounts for approximately 5 to 10 % of all fractures and upto 44% injuries to the shoulder girdle. About 70-80% of these fractures are in the middle third of the clavicle.

Fractures of the clavicle have been traditionally treated non operatively. Although many methods of closed reduction have been described, it is recognized that reduction is practically impossible to maintain and certain amount of deformity and disability is expected in adults (1)

In the past few years several publication have described about poor outcomes like malunions and nonunions (15%) after conservative treatment of severely displaced clavicular fractures.(2,3)

The proponents of early fixation of fresh clavicular fractures to prevent complication like malunion and non union emphasize the value of accurate reduction and rigid fixation in affording quick pain relief and promoting early functional recovery.(5)

The purpose of our study is to gain experience and evaluate results of the surgical management of fresh, displaced, comminuted middle third clavicle fractures

#### AIMS AND OBJECTIVES:

1. To study the technique of plating in displaced, comminuted middle third clavicular fractures,
2. To evaluate the results of the technique.
3. To compare the results with those in literature.

#### REVIEW OF LITRETURE:

Nichole EA in 1954 went on to remark that fractured clavicle cannot be immobilized. (6)

In 1960 Neer CS 0.1% patients treated with closed methods fail to heal. (7)'

In 1968 Rowe CR noted that it is impossible to support and immobilize a fracture of middle third of clavicle in an adult by external means with figure of eight, (8)

In 1977 Ali khan MA et al observed that plate fixation gave relief from pain within 12 hours and resulted in bone union in every case.(9)

Poingenfurt j et all in 1984 showed that with correct indication and good operative technique plating leads nearly always to healing in anatomic position with good functional outcome. (10)

Manske DJ et all in 1985 non union of middle third clavicle fixed with plating and bone grafting showed 100 % union by 10 weeks. (11)

Schwarz N et all in 1992 reported 4% non union rates after plating. Osteosynthesis of irreducible fracture of clavicle showed 12 % failure rate attributed to using a plate of inadequate length. (12)

Hill JM et al in 1997 showed conservatively treated middle third fracture showed 15% non union.(3)

Nordqvist A et all in 1998 demonstrated that few patients with fracture of the middle part of clavicle require operative treatment. (17)

Shen WJ et all 2000 concluded that for completely displaced clavicle fracture plating is reliable procedure in adults. (18)

Iannotti MR et all in 2002 showed clavicles plated at the superior aspect exhibit significantly greater biomechanical stability than those at the anterior aspect. (19)

Robinson CM et all in 2004 showed prevalence of nonunions at 6.2% (20)

Greenchenig W in 2011 concluded plate osteosyn thesis of clavicle results in a biomechanically strong construct foe mid shaft fractures. (22)

Robbin C et all found that operative treatment provide significantly lower rate of non union and symptomatic malunion and early functional return compared with non operative treatment. (24)

#### MATERIAL AND METHODS:

The study was carried out at Smt kashibai navle medical college Narhe, pune.

Total number of patients 30. Duration of study three years.

Criteria for selection was adult male female patients above 18 yrs who require surgical intervention for displaced comminuted middle third clavicle fracture.

Exclusion criteria was patient not willing for surgery and patients medically unfit for surgery.

Plain radiographs of clavicle with shoulder in anteroposterior view and 30 deg cephalic tilt were taken to assess the fracture. The fracture were classified according to Robinson's classification.

All patients were operated through a standard incision over the anterior aspect of clavicle centering over the fracture site. Fracture was stabilized with 3.5 recon plate with minimum 3 screws on each side of the fracture. some required interfragmentary screws. No primary bone grafting was done.

Post operatively patients affected limb was kept in a arm pouch sling. Suture removal was done on 14<sup>th</sup> post op day. Patients were regularly followed up weekly for four weeks and later every 2 weeks till radiological union.

The functional outcome were assessed by Constant and Murley score. (43, 44)

#### OBSERVATION AND RESULTS:

All 30 patients were followed up to radiological union. None of the patients were lost in follow-up.

The results were analysed both clinically and radiologically.

Age incidence: 19-29 y 16 pts, 30-39y 8pts, 40-49y 2pts and 50-59y 4pts.

Sex incidence: Male – 26pts, Female – 4 pts.

Side affected: Right – 10pts, left – 20pts.

Classification: B1- 25pts, B2- 5pts.

Associated injuries one patient had head injury and one patient had tibia fracture.

Duration to union: 8-12 weeks-26pts, more than 12 weeks- 4 pts.

Functional outcome as assessed by Constant and Murley score: Excellent in 26 pts, Good in 4pts there were no patients with fair or poor results.

#### DISCUSSION:

Clavicle fractures are usually treated conservatively. In the study conducted to analyse the results of conservative treatment by Hill et al(3) in 1997, Nordqvist et al (17) in 1998 and Robinson et al (25) in 2004 found poor results following conservative treatment of displaced comminuted middle third clavicle fracture.

So there are specific indication like displacement with or without comminuted middle third clavicle fracture (Robinson ty 2B1, 2B2) for which operative treatment is needed.

In our study direct injury to shoulder is the common cause of this fracture which holds true to other studies also, Bostman et al (16)

Average age of the patient was 32yrs, more common in young patients and predominantly in males which is similar to those in literature.

Majority of the fractures are closed type. non of the patients in our study had a compound fracture.

Duration of union in our study was 8-12 weeks in 26 pts and 4 pt required more than 12 weeks which eventually went on to union this was due to comminution and butterfly fragment. There was no nonunion. Lazarus MD (36) stated radiological union occurred approximately between 6-12 weeks.

There were no major complication regarding the operative site and implants.

The functional outcome according to Constant and Murley in this study of total 30 patients of fresh middle third clavicle showed excellent results in 26 patient's i.e.86.66% and good results in 4 patients i.e. 13.33%.

The advantage of rigid internal fixation and early mobilization of fresh displaced comminuted middle third fractures gives immediate pain relief and prevents the development of shoulder stiffness and non union or malunion.

#### CONCLUSION.

Clavicle fracture are usually treated conservatively but there are specific indication for which operative treatment is needed like comminuted displaced middle third clavicle fracture. For our Indian built primary open reduction and internal fixation with 3.5 reconstruction plate and screws provides more rigid fixation and does not require immobilization for longer periods.

It necessary to put the plate on the superior surface and at least 3 screws on each side of the fracture (6 cortices)

DCP is strong but it gives excessive prominence through the skin ad is difficult to contour hence 3.5 recon plate preferred and gave excellent result in 26 pts out of 30.

All fractures united and there was no case of non union.

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