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A study of patients with middle third clavicle fractures as per treatment given and radiological union

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Abstract
Introduction: The shoulder girdle is connected to the trunk by Clavicle. It ensures mobility and support to the function of upper extremity. Due to its subcutaneous position, clavicular fracture is a common traumatic injury around the shoulder girdle
Aims and Objectives: To study patients with middle third clavicle fractures as per Treatment Given and Radiological Union
Methodology: The present study was conducted from Jan 2013 to Sept 2015. The study consisted of a total of 58 patients of which 25 patients were retrospective and were assessed at the beginning of the study or at the end of 1 year. Prospectively 33 patients were studied. Among which 2 cases were lost to follow up, hence a total of 56 patients were studied and assessed at the end of one year.
Result: All the patients in plating group underwent ORIF. In the nailing group 53.8% patients underwent ORIF and only 46.2% needed CRIF. As per radiological Union; the majority of the Patients treated with PLATE required > 4 Weeks duration i.e. 93.3% as compared to TENS i.e. 23.1% while majority of the patients with ≤ 4 Durations were TENS i.e. 76.9% as compared to PLATE i.e. 6.7% this observed difference is statistically significant(X^2 =14.41, df = 1, p<0.001)
Conclusion: AS per Radiological Union TENS Technique of treatment is more effective than PLATE technique

Keywords: Radiological union, PLATE, TENS

1. Introduction
The shoulder girdle is connected to the trunk by Clavicle. It ensures mobility and support to the function of upper extremity. Due to its subcutaneous position, clavicular fracture is a common traumatic injury around the shoulder girdle. Of all the skeletal fractures, 5 -10% comprises of clavicle fracture because of its unique shape and configuration. The weakest part of the clavicle is the central third and it accounts for 69.2% to 81.3% of the fractured clavicles. Traditionally, displaced midshaft fractures of the clavicle have been treated conservatively with an expectation that little functional loss will occur despite substantial residual radiographic malalignment. However, previous studies have shown increasing evidence of patients having substantial dissatisfaction of the shoulder girdle following a clavicle malunion mainly due to the symptoms they experience and that include weakness, easy fatigability especially with overhead work.
Even though various methods have been proposed for closed reduction of displaced clavicular shaft fractures, none of it is constantly reliable in maintaining and achieving reduction. Hence, the displaced midshaft fractures of the clavicle mostly heal in the same approximate position as on the initial radiographs, i.e. with a characteristic feature of inferior, medially translated and anteriorly rotated deformity of lateral fragment.
Recently , the studies over a period of last ten years have shown increasing rates of nonunion and poorer functional outcomes following conservative treatment whereas the result of surgical treatment have been improving considerably Presently there is considerable preference for primary operative treatment. Plating has been the gold standard procedure for the midshaft clavicular fracture. Over the last decade there has been the emergence of intramedullary nailing for surgical fixation with better cosmetic outcome.

The Purpose of the study is to compare the functional outcome of displaced middle third clavicle fracture treated by plate and intra medullary titanium elastic nails [TENS] fixation with the help of constant murley score [5].

1.1 Aims and Objectives

To study patients with middle third clavicle fractures as per Treatment Given and Radiological Union

2. Methodology

The present study was conducted Jan 2013 to Sept 2015. The study consisted of a total of 58 patients of which 25 patients were retrospective and were assessed at the beginning of the study or at the end of 1 year. Prospectively 33 patients were studied. Among which 2 cases were lost to follow up, hence a total of 56 patients were studied and assessed at the end of one year. Patients between the age group of 18-60 years of age of both sexes, Displaced middle third fracture of clavicle based on Allman's classification [Group 1]. Floating shoulder injuries. Fractures presenting within 7 days of occurrence Bilateral clavicle fracture were included into the study while Clavicle fractures other than middle third, Open fractures, Clavicle fractures associated with neurovascular injury, Patients not willing for surgical management were excluded from the study. On presentation at the casualty a detailed history was taken from the patient starting with the age, name and sex. Importance was given to the mode of injury that is road traffic accident, direct blow or fall on out stretched hand and duration following which they presented to the hospital. A thorough clinical assessment was carried out which included the patients general condition, pulse, Blood pressure, heart rate and other associated injuries were noted. Other systems involvement like cardiac and respiratory system were cleared.

3. Result

Table 1: Distribution of the Patients as Per the Surgery done

Surgery	Plate		Tens		Total	
	No	Percentage	No	Percentage	No	Percentage
CR	0	0%	6	46.2%	6	21.4%
OR	15	100.0%	7	53.8%	22	78.6%
TOTAL	15	100%	13	100%	28	100.0%

All the patients in plating group underwent ORIF. In the nailing group 53.8% patients underwent ORIF and only 46.2% needed CRIF.

Table 2: Distribution of the Patients as per the Radiological union

Radiological union	PLATE		TENS		TOTAL	
	No	Percentage	No	Percentage	No	Percentage
≤4 Weeks	1	6.7%	10	76.9%	11	39.3%
> 4 Weeks	14	93.3%	3	23.1%	17	60.7%
Total	15	100%	13	100%	28	100%
Test of significance X^2 =14.41, df = 1, p value = 0.001						

As per radiological Union; the majority of the Patients treated with PLATE required > 4 Weeks duration i.e. 93.3% as compared to TENS i.e. 23.1% while majority of the patients with ≤ 4 Durations were TENS i.e. 76.9% as compared to PLATE i.e. 6.7% this observed difference is statistically significant(X^2 =14.41, df = 1, p<0.001)

4. Discussion

Traditionally fractures of the middle third clavicle have been treated conservatively with an arm sling and a figure of eight clavicle brace. Rowe [6] and Neer[7] in the sixties recommended this, because they observed a very small number of non-unions and this subsequently became the standard. It was not till the early nineties that surgical fixation started reemerging with the advent of newer methods and techniques. This led to various studies that reported a better functional outcome and lesser complications compared to that of non-operative management [1]. A computer tomography assisted cadaveric study conducted by Ledger. M in 2005 concluded that a shortening of the clavicle by 15mm led to an upward angulation at the sternoclavicular end and an increased anterior scapular version which leads to limitations of the shoulder girdle functions. pearson[8]in 2010 showed that the cost effectiveness of surgical fixation outweighed that of non-surgical management with poor functional outcomes. Atleast two projections should be obtained namely anteroposterior view and 45 degree cephalic tilt view in order to obtain an accurate evaluation of the fragment position after fracture. Because, it should be understood that the clavicle not only shortens but also gets angulated inferiorly and rotated medially. Such that the deformity truly lies in two planes and hence two views are essential.

Abduction lordotic view with the arm abducted 135 degrees and beam angled 25 degrees cephalad is extremely useful for the evaluation of internally fixed clavicle. Computed tomography may be useful in patients with a minimal displacement of the fracture fragments and with gross communition. [9, 10, 11]. Two operative techniques are commonly used for internal fixation of DMCF: Plate fixation and intramedullary nailing with a titanium elastic nail (TEN) [14]. Functional results after both the techniques proved to be superior compared with conservative treatment of DMCF in some recently reported prospective randomized studies. [8, 15]. Moreover, a recent meta-analysis revealed a significant lower nonunion rate after surgical treatment [13]. However, prospective randomized studies comparing the two operative techniques for treatment of DMCF were lacking [16].

In our study we found that, all the patients in plating group underwent ORIF. In the nailing group 53.8% patients underwent ORIF and only 46.2% needed CRIF. As per radiological Union; the majority of the Patients treated with PLATE required > 4 Weeks duration i.e. 93.3% as compared to TENS i.e. 23.1% while majority of the patients with ≤ 4 Durations were TENS i.e. 76.9% as compared to PLATE i.e. 6.7% this observed difference is statistically significant(X^2 =14.41, df = 1, p<0.001)

5. Conclusion

AS per Radiological Union TENS method of treatment is more effective than PLATE

6. References

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