

Frequency of Non-Union in Patients with Midshaft Clavicle Fracture Managed Conservatively by Using Polysling

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ABSTRACT

Objective: The objective of our study was to evaluate the frequency of non-union in patients with midshaft clavicle fracture managed conservatively by using polysling.

Methodology: A total of 125 patients with midshaft clavicle fracture were included and we applied simple polysling in supervision of a senior consultant. The patients were followed regularly for 12 weeks. The radiographic examination was carried out and the frequency of non-union was recorded. BMI < 18.5 Kg/m² and history of current smoking were treated as effect modifiers.

Results: 125 patients were included in our study sample with mean age of 37.90 ± 12.285 years ranged from 18 to 60 years of age. 81 patients (64.8%) were male and remaining 44 patients (35.2%) were females. 114 patients (91.2%) achieved radiological union at 12 weeks while 11 patients (8.8%) were unable to achieve. Gender, age distribution, BMI < 18.5 Kg/m² and smoking were similar in both groups with and without radiological union.

Conclusion: It is concluded that radiological union is excellent as 91.2% achieved radiological union at 12 weeks while 8.8% were unable to achieve.

Keywords: Midshaft clavicle fracture, Conservative management, Polysling, Effectiveness of polysling, Radiological union

INTRODUCTION

Clavicle fracture accounts for 2.6-4% of all fractures in adult population whereas 35% of all shoulder girdle injuries.^{1,2} Young population is commonly affected with shortened and displaced fracture of mid third clavicle, however, athletes face sports injuries or road traffic accidents which often require operative fixation.³

Various treatment options intend to immobilize and realign the fracture and also helpful for maintenance of alignment. Whereas around each author are of the view that alignment of displaced mid-shaft clavicle fracture after closed reduction is wishful only.⁵

Commonly used method include simple sling/figure-of-eight bandage, which become less comfortable and of no advance over simple sling. However, closed reduction of a simple mid-shaft fracture of clavicle may be a simple sling.⁵

It is commonly agreed that fractures (non-displaced) should be fixed non-operatively. However, a significant debate regarding choice of method of fixation of acute midshaft displaced clavicle fracture may be primarily treated operatively for avoidance of any complications i.e. malunion/non-union.⁶⁻⁷

A recent study⁴ revealed that there is no non-union (100% union) in patients treated with polysling for mid-shaft clavicle undisplaced fractures in adolescents. Another study recorded that 24% of the cases treated with polysling were having non-union while another study³ recorded 17% of the cases having non-union in this technique. All these fractures were undisplaced.

The rationale of the study is that polysling is being used in our routine practice in patients presenting with midshaft clavicle fracture but unfortunately no local documentary evidence in last 5 years is recorded while the above mentioned studies are showing significant difference

with regards to frequency of non-union with smaller sample size. However, the results of the current study will be helpful to use this technique in future and primary data in our local population will also be generated.

METHODOLOGY

We enrolled 125 cases, between 18-60 years, gender: Both (male and female) and diagnosed cases of undisplaced mid shaft clavicle fracture whereas those with pathological fractures determined by bone biopsy, chest x-ray and CT scan and open fractures and displaced fractures determined clinically by history and examination. The data was collected from patients presenting in outpatient department of Orthopedics Unit-1 Jinnah Hospital Lahore fulfilling the inclusion and exclusion criteria. An informed consent was obtained to include their data in the study. Then the patients were applied simple polysling in supervision of the senior consultant. Then the patients' were followed regularly for 12 weeks. All patients were evaluated and counselled by researcher himself to reduce bias. After 12 weeks of applying polysling, the radiographic examination was done and the frequency of non-union (according to operational definition) was recorded by the researcher himself. In cases of non-union further management plan was done in consultation with the supervisor. BMI < 18.5 Kg/m² and history of current smoking were treated as effect modifiers. Data was stratified for age, gender, BMI < 18.5 Kg/m² and history of current smoking. All this information was recorded on a pre-defined proforma attached as Annexure. The data was analyzed using SPSS version 16, mean+standard deviation for variables like age was recorded. Frequency and percentage of variables like gender, presence/absence of non-union.

RESULTS

In this study, 82 patients (65.6% were less than 40 years of age while rest of 43 patients (34.4%) were either 40 years of age or more, mean age of 37.90 ± 12.285 years. (Table I)

In our study sample 81 patients (64.8%) were male and remaining 44 patients (35.2%) were females. (Table II)

114 patients (91.2%) were having radiological union while rest of 11 didn't have it. (Table III)

When we cross tabulated age groups with radiological union, results were non-significant (p=0.38). Out of 114 radiological union patients, 73 were less than 40 year while 41 were more than 40 years of age. (Table IV)

To determine the distribution of radiological union among gender, we cross tabulated and results were again non-significant (p=0.058). Among 114 radiological union patients 71 were male and 43 were female. (Table V)

Table I : Frequency distribution of sampled population by Age Groups

	Frequency	Percent
Less than 40 Years	82	65.6
More than 40 Years	43	34.4
Total	125	100.0

Mean age: 37.90 ± 12.285 years

Table II : Frequency distribution of sampled population by Sex

		Frequency	Percent
Valid	Male	81	64.8
	Female	44	35.2
	Total	125	100.0

Table III : Frequency distribution of sampled population by Radiological Union

		Frequency	Percent
Valid	Yes	114	91.2
	No	11	8.8
	Total	125	100.0

Table IV : Crosstab between Age Groups & Radiological Union

		Radiological Union		Total
		Yes	No	
Age Groups	Less than 40 Years	73	9	82
	More than 40 Years	41	2	43
Total		114	11	125

Using chi square test, p value=0.38 (non-significant)

Table V: Crosstab between Sex & Radiological Union

		Radiological Union		Total
		Yes	No	
Sex	Male	71	10	81
	Female	43	1	44
Total		114	11	125

Using Fisher's Exact Test, p value=0.058 (non-significant)

DISCUSSION

In our study, 114 patients (91.2%) achieved radiological union which is not appreciable but it is comparable with another study recorded that 24%³ of the cases treated with polysling were having non-union. A recent study⁴ revealed that there was no non-union (100% union) cases in patients treated with polysling for mid-shaft clavicle undisplaced fractures in adolescents. While another study³ recorded 17% of the cases having non-union in this technique. All these fractures were undisplaced.

125 patients, included in our study sample had mean age of 37.90 ± 12.285 years ranged from 18 to 60 years of age. 82 patients (65.6% were less than 40 years of age while 43 patients (34.4%) were either 40 years of age or more.

Common gender in our data was male gender, i.e. (64.8%), it implies that a significant physical activity in male cases. This also determines the health seeking behavior in our community in which male are more prone to the fracture although this fracture is usually not due to sports activity only.

When we cross tabulated age groups with radiological union, results were non-significant. Out of 114 radiological union patients, 73 were less than 40 year while 41 were more than 40 years of age. It implies that union after polysling use for mid shaft fracture of clavicle is not dependent on age of patient.

To determine the distribution of radiological union among male and female patients, we cross tabulated and results were again non-significant (p=0.058). Among 114 radiological union patients 71 were male and 43 were female. To our surprise gender did not affect the radiological union i.e. the radiological union was similar between male and female although it is purposed that it vitamin D deficiency and poor bone density is present in our female population due to local customs and decrease in calcium intake.

Similarly when we cross tabulated BMI< 18.2 kg/m2 with radiological union and applied fisher's exact test, results were non-significant (0.265). Only 3 radiological union patients had BMI below 18.5 kg/m2. To find relationship among current smoker and radiological union we again cross tabulated them, results were non-significant (p=0.058). Out of 114 radiological union patients 67 were currently smoking.

CONCLUSION

It is concluded that radiological union is excellent as 91.2% achieved radiological union at 12 weeks while 8.8% were unable to achieve. Limitation of current study is that we have not assessed the nutritional status and mode of injury in our population

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