

Management of Clavicular Fractures

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Running Title: Clavicular fracture

Abstract: *Background:* Fractures of the clavicle are a common presentation at the accident and emergency and outpatient clinics following road traffic accidents and birth trauma. Injuries may result from either direct or indirect trauma to the shoulder. Treatment varies from non-operative measures (arm sling, figure of 8) to surgical measures. *Methods:* A retrospective study in which case files of patients with clavicle fractures were retrieved over 5 years and cases studied, i.e. demography, mechanism of injury, type of clavicular fracture, treatment offered. *Results:* A total of 58 cases were seen with a male female ratio of 2.4: 1. Ages ranged from 1 day old to 65 years with a mean age of 32years +/- 1.8 The left clavicle accounted for 70% and there were no complications from these injuries, there were however associated injuries. Direct injury to the shoulder accounted for 48.2% and were of Almann class type 1 (62%). Figure of 8 sling had the modal treatment (50.2%) while surgical intervention was the least (5.1%). *Conclusion:* Fractures of clavicle are a common presentation to the orthopaedic surgeon following trauma or birth injuries. Commonest type is Almann class 1 and conservative management most commonly done, however surgical option needs to be better explored.

1. Introduction

Clavicular fractures are a common cause of orthopaedic emergency¹ and outpatient presentation². It accounts for 5% of all fractures³ and about 25% of all shoulder girdle injuries⁴. Its involvement in injuries cuts across all age groups ranging from neonatal period following birth trauma to the elderly⁵.

As varied as the demographic presentation of this fracture, even more diverse are the management options that have evolved over the years.

Aetiology of clavicular fractures include road traffic crashes, assault⁶, sporting activities⁷, domestic abuses, bomb blast, penetrating injuries and birth injuries. A study done by Postachini et al found the most common cause of clavicular fracture to be Road traffic accidents accounting for 80% in etiology⁸.

Mechanism of clavicular fractures could be from direct or indirect trauma. Indirect mechanism of injury include fall on an outstretched arm and a fall unto the point of the shoulder. Recent data indicates indirect trauma as the commonest mechanism of clavicular fracture.

Direct mechanism of clavicular fracture may arise from blunt⁹ or penetrating injuries.

This study was aimed at identifying the epidemiology and management of clavicular fractures in our environment.

2. Methodology

A retrospective cross-sectional review of patients presenting with clavicular fractures in our center over the last 5years.

3. Result and Discussion

A total of 58 cases were seen during the study period with a male /female ratio 2.4: 1 .The ages range patients from

1day old to 65years with a mean age of 32years ±1.8. The left clavicle was the most injured accounting from 70% of fractures. There were no complications from the fractures sustained. Associated injuries from our study included Head injury [65.2%], abrasion burns[11.6%], cervical spine injury [11.6%], pleural effusion[5.8%], splenic injury [5.8%]. Radiological assessment of clavicular fractures in the study revealed 37.9% of Undisplaced fractures, 44.8% displaced and 8% of these fractures have a 2.5cm overlap. The table 1 shows the patients socio-demographic details over the study period.

3.1 Discussion

Table 1 shows the age distribution of patients with clavicular fractures. It is noted that the modal age group was the young adult age group accounting for 31%. This was followed closely by the neonates accounting for 25%. The least affected were the infants which accounted for 3.4%. A possible explanation for high occurrence in the young is probably due to the fact trauma is the leading cause of fractures in this age group as documented in previous studies. The relatively high incidence of clavicular fractures in the neonates were possibly due to birth injuries. However, many of these were missed as patient presented due to callous formation which was felt as a bony lump.

As regards aetiology of injury 69% were due to RTA which was the modal cause of clavicular fractures. This was followed closely by birth injuries. This pattern agrees with the age group distribution described above, as the young age group are involved in more activities and hence prone to more accidents. Jan Nowak et al found a significantly high incidence of young males sustaining comminuted fractures more than women¹⁰.

The most implicated mechanism of injury in this study was due to a fall unto the shoulder accounting for 48.2%. This was closely followed by a fall on an outstretched hand which accounted for 31%. Fall unto the shoulder ranked high as a mechanism of injury possibly due to the fact that the most

common aetiology was following an RTA causing a strike of the shoulder on hard surfaces .A study by Stanley et al also corroborated this mechanism as its commonest.¹¹

The location of fracture using the Alman classification was also noted. Type 1 fractures[middle 3rd] accounted for the modal pattern of fracture accounting for 62% which is in keeping with a study done by Nordqvist et al³, while type 2 ranks lowest in frequency [17.2%].The modal distribution agrees with literature ,but the type 2 accounting for the least negates current literature documentations.

Treatment modalities offered patients with clavicular fracture varied from a figure of eight bandage[50.2%],broad arm sling[24.1%],collar and cuff[20.6%] and surgery in the form of ORIF with a reconstruction plate accounting for the least treatment modality[5.1%].The figure of eight fracture is usually used for displaced fractures ¹²,while collar and cuff/sling are used for Undisplaced fractures. In our environment surgery[plates and screw] is used for displaced and overlapped fractures .However ,the low rate of surgery in our study may be due to the patients wish to be managed non-operatively, financial challenges with implant procurement and surgical shyness while avoiding the risk involved.

In a study done by poigenfurst et al¹³ it was stated that surgery reduces the risk of non-union and has a better outcome when compared to conservative treatment.Sahal et al found a significant improvement in the DASH score ,as well as faster union rates in patients managed with plate fixation compared to conservative treatment¹⁴.

4. Conclusion

Clavicular fractures are a common presentation to the orthopaedic surgeon. Majority are due to trauma in the young male [68.9%] and are usually displaced Alman type 1 [62%] fractures. Conservative treatment has been the mainstay .However surgical option should be better explored when its indication is established. The authors have no conflict of interest to declare.

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Tables

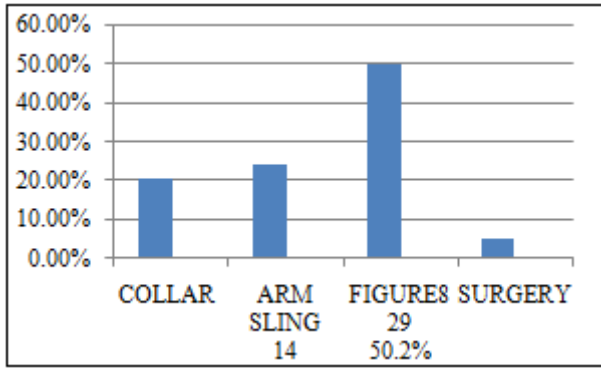
Table 1: The Patients Socio-Demographic Details Over The Study Period

Age Group	n	%
Neonates	15	25
Infants	2	3.4
Toddlers	3	5.2
Adolescent	4	6.9
young	18	31
Middle aged	7	13
Elderly	9	15.5

Mechanism Of Injury	n	%
Fall on outstretched hand[FOOSH]	18	31%
Fall unto the shoulder	28	48.20%
Direct blow to the shoulder	12	20.60%

ALMAN CLASS	n	%
1	36	62
2	10	17.2
3	12	20.6

Etiology	n	%
RTA	82	69%
Birth Injury	15	25.8
Assault	2	3.40%
Sporting injury	1	1.72%



Bar Chart Showing Treatment Modality