

Original Research

Assessment of Cases of Clavicle Fractures - A Clinical Study

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ABSTRACT:

Background: Clavicle fractures are very common injuries in adults (2-5%) and children (10-15%). The present study was conducted to assess cases of clavicle fracture in adults. **Materials & Methods:** The present study was conducted on 104 patients of both genders. Patients were subjected to X- ray and CT scan to assess fracture site. Allman classification such as group I-middle 1/3, group II-lateral 1/3 (acromial) and group III-medial 1/3 (sternal) was assessed. **Results:** Out of 104 patients, males were 64 and females were 40. Group I fracture was seen I 56, group II in 34 and group III in 14. The difference was significant (P< 0.05). Left side was involved in 45 and right side in 59 cases. Reason for fracture was road traffic accident in 68, violence in 26 and fall in 10. **Conclusion:** Clavicle fracture is common in all. There was male predominance and most common reason was road traffic accidents.

Key words: Clavicle, fracture, Adults.

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INTRODUCTION

Clavicula means "key" and is the diminutive of clavis in Latin. Clavicle fractures are very common injuries in adults (2-5%) and children (10-15%) and represent the 44-66% of all shoulder fractures.¹ Clavicle fractures are common injuries in all age groups. They account for 2% to 5% of all the fractures with the incidence in children being >10%. Its prevalence of fracture is highest among the young population. Males are affected approximately twice as often as females. Females show higher prevalence in the sixth decade of life as a result of osteoporosis.

The clavicle is the first bone in the human body to begin intramembranous ossification directly from mesenchyme during the fifth week of fetal life.² The clavicle has both a medial and lateral epiphysis. It has S-shaped double curve. This contouring allows the clavicle to serve as a strut for the upper extremity, while also protecting and allowing the passage of the axillary vessels and brachial plexus

medially. The growth plates of the medial and lateral clavicular epiphyses do not fuse until the age of 25 years. Hence young adults are more prone to developed fractures. This change of contour, which is most acute at the junction of the middle and outer thirds, may explain the frequency of fractures seen in this area.³

Although unilateral clavicle fractures are commonly encountered, bilateral clavicle fractures have been reported extremely rarely in the literature. The incidence of bilateral involvement is less than 0.5% of all the clavicle fractures. Conservative management has been the preferred treatment modality for most of the clavicle fractures because of the high complication rates reported after surgical treatment. But there are evidences in the literature that suggest a high risk for nonunion or shoulder dysfunction after non-operative treatment in bilateral clavicle fractures.⁴ The present study was conducted to assess cases of clavicle fracture in adults.

MATERIALS & METHODS

The present study was conducted in the department of Orthopedics. It comprised of 104 patients of both genders. All patients were informed regarding the study and written consent was obtained. Ethical clearance was taken from institutional ethical committee.

A thorough clinical examination was performed in all patients. Patients were subjected to X- ray and CT scan to assess fracture site. Allman classification such as group I- middle 1/3, group II-lateral 1/3 (acromial) and group III- medial 1/3 (sternal) was assessed. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Gender	Males	Females
Number	64	40

Table I, graph I shows that out of 104 patients, males were 64 and females were 40.

Graph I Distribution of patients

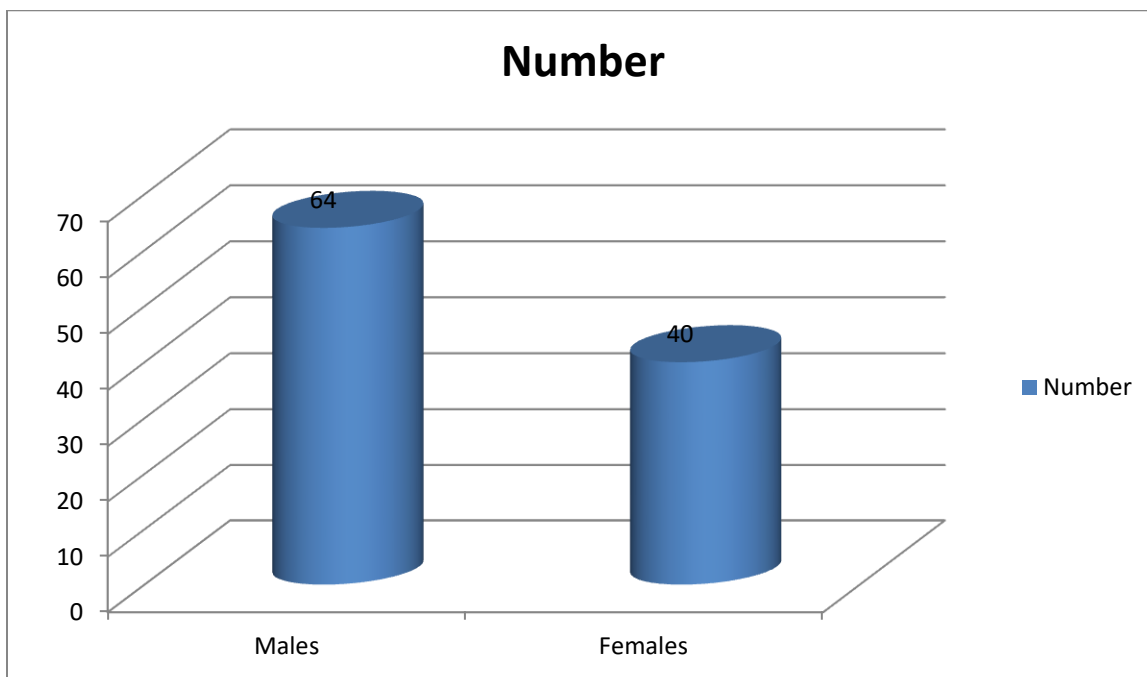


Table II Distribution of patients based on Allman Classification

Classification	Number	P value
Group I	56	0.01
Group II	34	
Group III	14	

Table II, graph II shows that group I fracture was seen in 56, group II in 34 and group III in 14. The difference was significant (P< 0.05).

Graph II Distribution of patients based on Allman Classification

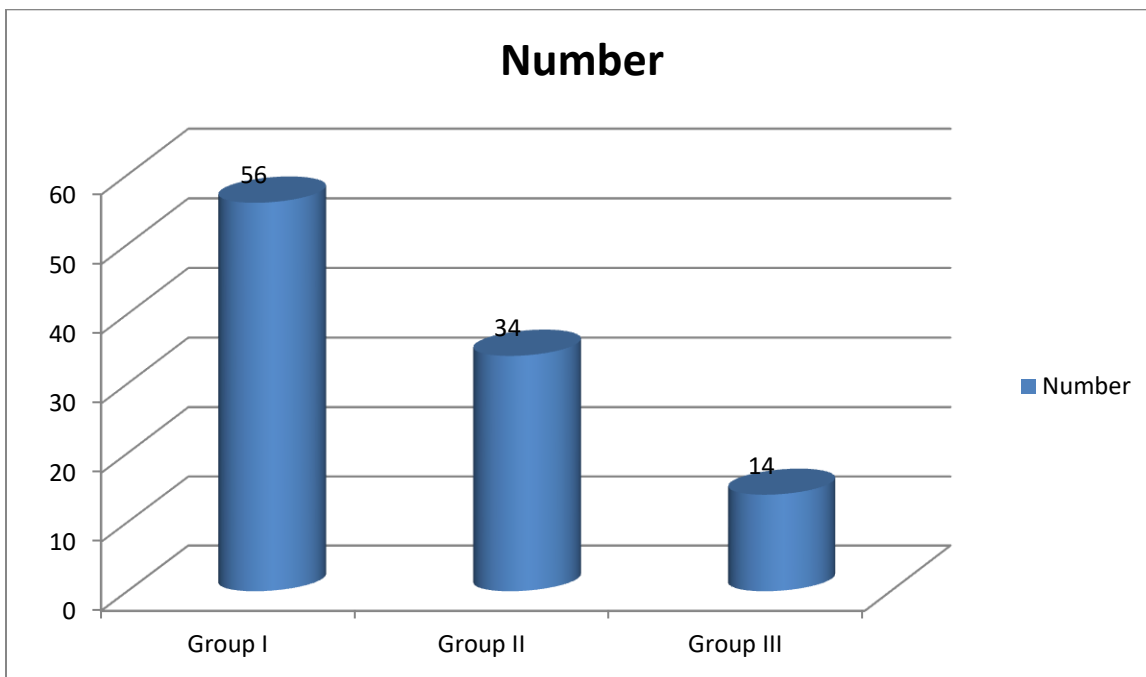
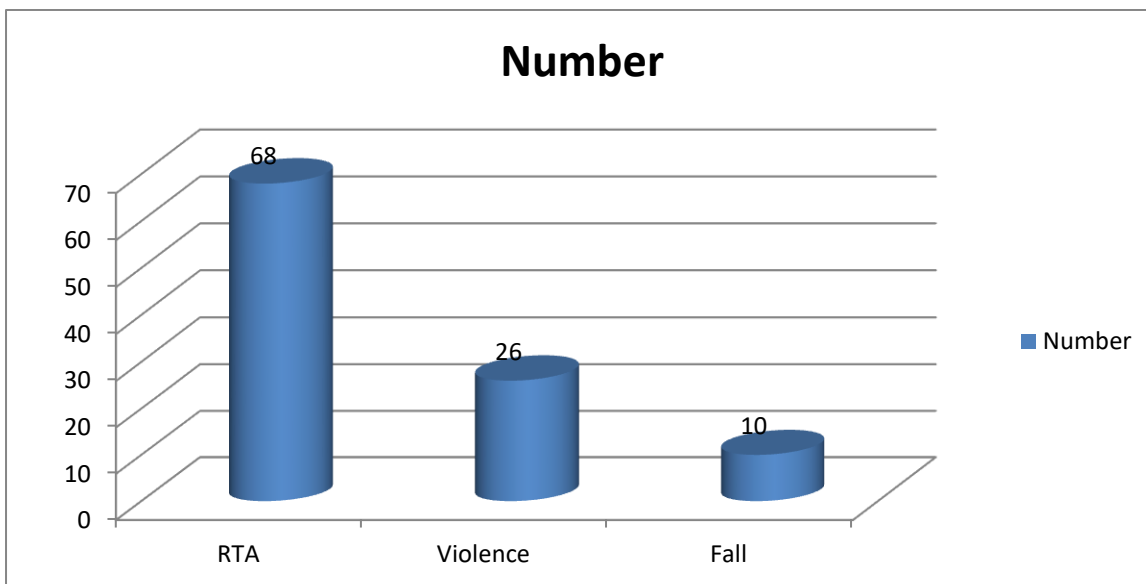


Table III Side of clavicle

Side	Number	P value
Left	45	0.02
Right	59	

Table III shows that left side was involved in 45 and right side in 59 cases.

Graph II Reason of fracture



Graph III shows that reason for fracture was road traffic accident in 68, violence in 26 and fall in 10.

DISCUSSION

The mechanism of sustaining bilateral clavicle fractures is different from that of a unilateral clavicle fracture.⁵ They are often caused by a compressive force across both shoulder girdles, direct blows to both shoulder girdles or an indirect blow such as a fall onto the shoulder. Bilateral clavicle fractures are usually associated with high-energy trauma and therefore are associated with other concomitant injuries.⁶

The clavicle is the only bone that connects the shoulder girdle with the trunk. Its function lies in the precise positioning and abduction of the arm.⁷ The entire length of the clavicle lies directly below the skin. Frequent injury to the mid third reflects the anatomy, position and specific construction of the clavicle.⁸ The human clavicle is S-shaped, medially compact but becoming thinner and flatter to form an oval cross section towards the mid third. This means that the forces of oscillation and resistance are low, especially in the horizontal plane, which explains frequent injuries due to the impact of axial force. For a long time a fall onto the outstretched arm was propagated as the most frequent cause of injury.⁹ Based on a better understanding of the biomechanics involved as well as a larger number of case studies, it has been possible to identify a fall directly onto the shoulder or direct force applied to the shoulder as the most frequent cause of clavicle fracture. Those most vulnerable are young men who frequently sustain their injuries during sports activities or in road accidents.¹⁰ The present study was conducted to assess cases of clavicle fracture in adults.

In this study, out of 104 patients, males were 64 and females were 40. Group I fracture was seen in 56, group II in 34 and group III in 14. Eskola et al¹¹ conducted a study and found that out of 60 clavicle fractures, 48 (80%) were seen in males and 12 (20%) were seen in females. The difference was statistically significant. Fractures were seen in middle 1/3rd (60%), middle (20%), lateral 1/3rd (11.6%) and compound (8.4%). Maximum cases were involving middle third of clavicle and least cases were seen involving compound fractures (8.4%). 24 (40%) cases were seen in right side and 36 (60%) cases were seen in left side. The difference was not significant. 36 cases were due to road traffic accident, 21 cases were of fall and 15 cases occurred due to work place injury.

We found that left side was involved in 45 and right side in 59 cases. The reason for fracture was road traffic accident in 68, violence in 26 and fall in 10. Allman Classification is as follows Group I-middle 1/3, Group II-lateral 1/3 (acromial) and Group III-medial 1/3 (sternal). Neer made a significant revision to the Allman classification scheme. Group II (distal clavicle) fractures were further divided into 3 types based on the location of the clavicle fracture in relation to the coraco-clavicular ligaments. These are Type I Fractures: Minimally displaced and occur lateral to an intact coraco-clavicular ligament complex; these fractures may be treated non-operatively and symptomatically. Type

II Fractures: Occur when the medial fragment is separated from the coraco-clavicular ligament complex; the medial fragment is displaced cephalic by the pull of the sternocleidomastoid muscle, and the distal fragment is displaced caudally by the weight of the upper extremity, with the intact coraco-clavicular ligament complex; the resulting deformity leads to marked displacement of the fracture ends, predisposing this fracture type to a higher prevalence (up to 30%) of nonunion. Type III Injuries: Minimally displaced or non-displaced and extend into the acromioclavicular (AC) joint; as with type I fractures, these injuries can be treated symptomatically; the development of late AC degenerative changes can be treated with distal clavicular excision.¹²

CONCLUSION

Authors found that clavicle fracture is common in all. There was male predominance and most common reason was road traffic accidents.

REFERENCES

1. Edelson JG. The bony anatomy of clavicular malunions. *J Shoulder Elbow Surg.* 2003;12:173-8.
2. Khan LA, Bradnock TJ, Scott C, Robinson CM. Fractures of the clavicle. *J Bone Joint Surg Am.* 2009;91:447-60.
3. Rowe CR. An atlas of anatomy and treatment of midclavicular fractures. *Clin Orthop Relat Res.* 1968; 58:29-42.
4. Sguazzini VC. Simultaneous bi-lateral fracture of the clavicle. *Arch Ortho.* 1967;80:351-6.
5. Jeray KJ. Acute midshaft clavicular fracture. *J Am Acad Ortho Surg.* 2007;15:239-48.
6. Robinson CM. Fractures of the clavicle in the adult. Epidemiology and classification. *Journal of Bone and Joint Surgery.* 1998;80:476-84.
7. Andersen K, Jensen PO, Lauritzen J. Treatment of clavicular fractures. Figure-of-eight bandage versus a simple sling. *Acta Orthop Scand.* 1987;58:71-4.
8. Böstman O, Manninen M, Pihlajamäki H. Complications of plate fixation in fresh displaced midclavicular fractures. *J Trauma.* 1997;43:778-83.
9. Crenshaw AH. Fractures of the shoulder girdle arm and forearm. In: Crenshaw AH, editor. *Campbell's operative orthopaedics.* 8th ed. St. Louis: Mosby Year book; 1992; 989-1053.
10. Lester CW. The treatment of fractures of the clavicle. *Ann Surg.* 1929;89:600-6.
11. Eskola A, Vainionpää S, Myllynen P, Pätäälä H, Rokkanen P. Outcome of clavicular fracture in 89 patients. *Arch Orthop Trauma Surg.* 1986;105:337-8.
12. Nordqvist A, Petersson C. The incidence of fractures of the clavicle. *Clin Orthoped and Rel Res.* 1994;300:127-32.