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Burden of isolated clavicle fractures at tertiary care healthcare centre: a look into registry

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ABSTRACT

Background: Clavicle is one of the common bones to undergo fractures with incidence rate higher in second to third decade of one's life as well as in elderly age. Management of these clavicle fractures have always been a subject of debate, where literature have been advocating both non-operative as well as operative methods.
Methods: The present study was conceived to know the burden of these isolated clavicle fracture cases reporting to tertiary level healthcare institute of North India and to study about their management pattern.
Results: During the five years study duration (2014-2018), a total of 38 patients had reported to the trauma centre of the institute. Out of total, males had more preponderance 77% (29) and incidences were reported more in younger population. All patients were managed well by opting conservative measures, besides deformity had been reported in 2 (5.26%) patients. 3 (7.9%) patients had reported with complaints of pain, weakness while doing work, fatigue and pain when lying on the affected shoulder None of the patient was managed by open reduction and fixation.
Conclusions: The present study concludes that the number of patients having isolated clavicle fracture are not contributing to any sort of burden at tertiary level institutes and are not even time consuming.

Keywords: Clavicle, Isolated, Fracture, Management

INTRODUCTION

Clavicle is an S-shaped subcutaneous bony linkage between thorax and shoulder girdle and plays a vital role for movements at shoulder girdle. It is one of the first bone in human body to undergo intramembranous ossification as early as fifth week of foetal life, but, growth plates of epiphyses did not get fused till 25 years of age.[1] Clavicle is one of the common bones to undergo fractures and early literature dates back during the era of Hippocrates, where it has been stated; "when a fractured clavicle is fairly broken across it is more easily treated, but when broken obliquely it is more difficult to manage".[2] These fractures mostly are found in younger age group with incidence rate higher in second and third decade of life, and thereafter there has been a declining trend towards clavicular fractures with every decade, after 30 years of age. The incidence of clavicular fractures has been found in the later part of one's life, and, thus incidence of these fractures in adolescent and adult age group is found to be between 29 and 64 per 100,000 persons.[3,4]

The aetiology of clavicle injuries in adolescent age group has been attributed most commonly to road traffic accidents, sports related injuries and a little to incidents of fall. However, these incidents of fall are more often reported among elderly people.[5] The most frequent injury mechanism is a direct fall on the shoulder. Sports injuries are responsible one of the major causes of all clavicle fractures in adolescents. Cycling is also a popular sports activity worldwide, and it has increasingly spread in Brazil in last few decades. Literature have shown fractures as one of the most frequent injuries in this subcontinent, and out of these clavicle fractures as the most common injury and

it accounts for almost 50% of all fractures between 2004 and 2008, as per the study by Robertson.[6,7] It has been further stated that though, these clavicular fractures usually heal regardless of the selected treatment, complications are possible, warranting careful attention to these injuries.

Clavicle fracture is one of the common traumatic injury of shoulder girdle due to its subcutaneous position. These injuries are usually caused by either low-energy or high-energy impact. Fracture of the clavicle approximately accounts for 2.6% to 5% of all adult fractures and up to 35% of injuries are related to the shoulder girdle.[3] Multiple schemas have been laid classifying these clavicle fractures and most accepted system is as narrated by Allman, where clavicular fractures are been divided into three distinct anatomical sites; medial, shaft and lateral end of clavicle.[8] More than 80% of all the clavicle fractures involve Mid-shaft, whereas around 18 and 2% fractures involve medial and lateral end of clavicle respectively.[4,5] This is well explained anatomically with the facts that medial and lateral clavicular parts are firmly attached with strong muscles and ligaments, while middle part does not have strong attachments and have more vulnerability towards traumatic injuries.[9]

Further, the management of these clavicle fractures have always been a subject of debate. Conventionally, clavicle fractures have been managed non-operatively, regardless of type of fracture. Literature in 1960s have shown good outcome for mid-shaft clavicle fractures treated non-operatively and lower non-union rate was reported in comparison to fractures treated by using primary open reduction.[10,11] In contrast to this, various recent studies have documented opposite outcomes with newer methods of fracture reduction and fixation, which might have contributed to two-third rise in operative treatment of clavicle fractures in Sweden in the last decade.[12-16]

Therefore, a study was conceived to know the burden of isolated clavicle fracture cases, their management aspects and profile of patients reporting to a tertiary level healthcare institute of North India.

METHODS

The study was conducted in advanced trauma centre (ATC) of one of the premier tertiary care multispecialty institute of north India. The ATC is 110 bedded block providing services (both therapeutic and diagnostic) for the specialties of General Surgery, Orthopaedics, Neurosurgery, Plastic Surgery and Urology etc. On reporting to ATC, patient is first examined under department of General Surgery, and provided needed first aid care and after stabilization, patient is managed under the respective department(s) according to the nature of the injuries.

It was a retrospective study, where five years data (2014-2018) were obtained to study the burden pertaining to isolated clavicular fracture reporting to the institute. The information regarding patient demographic profile, type of clavicle fracture (unilateral or bilateral), and management type of fracture were obtained from patient admission files retrieved from hospital medical record department. Patients having clavicle fractures associated with other injuries were excluded from the study.

RESULTS

The ATC receives around 40 patients daily as OPD on an average. The total number of OPD patients from year 2014 to 2018 is 108, 855. The inpatient admission for the study period was 30,982 patients (Table 1).

Table 1: Annual census of ATC (2014-18).

Year	OPD intake	IPD intake
2014	18922	5484
2015	20446	5359
2016	21508	6350
2017	24097	5374
2018	23882	8415
Total	1,08,855	30,982

Source: medical record department.

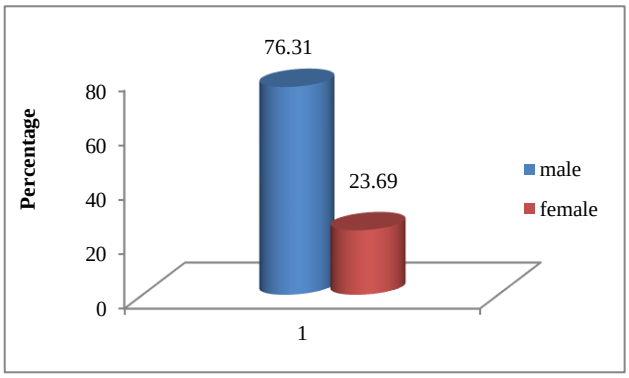

Figure 1: Gender-wise distribution of isolated clavicle fractures.

It was found that a total of (n=38) cases presented in ATC as isolated clavicle fractures from 2014 till 2018. Out of these 38 cases, males were 77% (29) and 23% (9) females (Figure 1). Among males, the incidence is more in young population i.e. 44% patients belonged to the age group of 20-40 years of age group, followed by 39% of patients in age group of >40 years. While only 15% of patients were of in the age group less than 20 years as shown in (Figure 2).

All the patients were managed by opting conservative measures and none of the patient was managed by open reduction and fixation or any sort of operative methods. Malunion and deformity had been reported in 2 (5.26%) patients. Out of the total, 3 (7.9%) patients had reported with complaints of pain, weakness while doing work, fatigue and pain when lying on the affected shoulder.

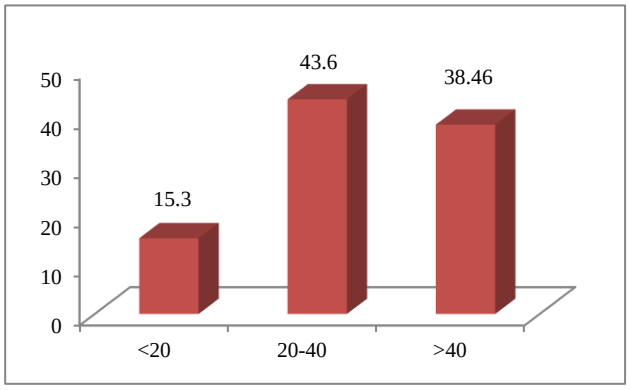

Figure 2: Age-wise distribution of isolated clavicle fracture.

DISCUSSION

Clavicle fractures are one of the common injuries. As per the studies of Robinson and Postacchini et al the overall reported annual incidence of isolated clavicular fracture was in the range from 29/100,000 to 64/100,000 with the highest incidence (up to 150/100,000) reported in young males.[4,5,17] In the present study, the incidence rate has been found to be 38/108,855 over the years. As per the study by Nordqvist, it has been reported that the annual incidence of clavicular fractures in males (15 to 19 years age) was about 150 per 100,000 whereas it was reported to be around 50 per 100,000 in females.[3] The study of Robinson et al have reported ratio to be 2.6:1 among males and females.[4]

The present study reveals that male preponderance of clavicle fractures was 77% and 23% in males and females respectively and findings were comparable to studies pertaining to epidemiology and aetiology of clavicular fracture by Postacchini et al in Italy and Kihlstrom et al in Sweden.[5] In the study by Agarwal et al, out of 60 clavicle fractures cases, 48 (80%) were reported in males and 12 (20%) were in females and difference was statistically significant.[18] In the present study most of the clavicular fractures were involving middle shaft of clavicle which was similar to findings in study by Agarwal et al where fractures were seen in middle 1/3rd of shaft in 60% of cases, 20% in medial shaft and 11.6% in lateral part of the shaft and compound were found in 8.4% fractures.[18]

The optimal treatment is individual based and depends upon patient clinical status and fracture pattern. Traditionally, these clavicular fractures have been managed non-operatively. Although, various measures for closed reduction have been documented, yet, it has been unconditionally recognized and accepted that appropriate reduction is impossible and a certain degree of deformity as well as disability is well expected. Although the majority of clavicle fractures cases have been managed by non-operative methods, still, certain indications exist requiring operative interventions. In the present study, all the cases were managed conservatively and non-union and malunion were not reported in any of the cases. As per the reports, conservatively treated fractures usually got united in around 97% cases and the time of union was also not different when it was managed using a collar and cuff, sling or by figure-of-eight (FEB) bandage.[19,20] FEB or triangular bandage is application of specially made bandage for restoring the retro-position of shoulder joint, prevent stumps superimposition and to limit clavicular shortening.[21] According to literature, failure rate for conservative measurement of fractures ranges from 5% to 30% with patients complaining of localized pain, diminished work power, paraesthesia, rapid development of fatigue and aesthetic defects.[22,23] In the present study, these symptoms were observed in 3 (7.9%) cases studied. Long bone fractures are usually unstable and have more risks of having non-union and malunion. The nonoperative approaches opted for management of these long bones fractures are usually considered unacceptable and often result in considerable level of functional deficits. Even no consensus exists regarding management of clavicular fractures as with some literature supports a non-operative while others case studies advocates operative approach.[24-26] Therefore, exact methods for managing clavicle facture depends on several factors viz. age, clinical status of patient, exact fracture site and other associated injuries. Therefore, for proper management it is very much essential to achieve alignment both antero-posterior as well as lateral alignment of clavicle as clavicle anatomically being a curvilinear in shape.

CONCLUSION

To conclude, clavicle is one of the vital components for normal functioning of arm and is an important part of shoulder girdle. And, also management of clavicle fractures is still the matter of debate. Further, the study concludes that the number of patients having isolated clavicle fracture are not contributing to burden at tertiary level institutes and are not even time consuming.

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