
Prevalence of Midface Fractures-A Retrospective Institution Based study

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Abstract: The aim of this study was to evaluate the prevalence of midface fractures among different age groups. A retrospective study was conducted among patients who reported with a history of midface fracture to the Department of Oral and Maxillofacial Surgery during July 2019 - March 2020 . All the datas were obtained from the case records of the patient. Road traffic accidents are the most common cause for midface fractures. Individuals greater than 30 years were the ones mostly affected by midface fractures . They accounted to about 52% of the total population in the study. Dentoalveolar fracture is the most common fracture of the midface. A total of 23% of cases were reported to have dentoalveolar fractures. Chi Square test was used to find the association between the age and midface fracture. P value of 0.4 was obtained , which was statistically insignificant. From this small sampled single centre retrospective study it was concluded that midface fractures were mostly contributed by road traffic accidents in middle aged males.

Keywords: Dentoalveolar fractures, Midface Fractures, Road Traffic accident

INTRODUCTION

Mid face generally describes the central third of the face. The facial bones which form the mid face are thin and membranous. It includes the maxillary sinus, ethmoidal cells, nose, ethmoidal cells, sphenoidal sinus and orbit (Jesudasan, Wahab and Sekhar, 2015). Midface fractures can result in facial disfigurement and functional limitation. Fractures of the central midface comprises all fractures located between the nasofrontal suture line and the maxillary alveolar processes with the exception of the zygomas. The classification systems of mid face fracture was described by Guérin, Le Fort and Wassmund (Cornelius *et al.*, 2014)

Early diagnosis is essential to detect facial deformity, concomitant injuries, emergent complication and also to plan treatment for the patient (Christabel *et al.*, 2016). The epidemiology of midface fractures varies between the population with regard to the incidence, aetiology and types due to environmental, socioeconomic cultural and lifestyle differences (Januário *et al.*, 2011) (Prein, 2012) (Haug, Haug and Hazrati, 1991). A retrospective study was conducted among patients who reported with a history of midface fracture. All the datas were obtained from the patient's case record. The history of fracture, the diagnosis, the treatment protocol followed were thoroughly analysed.

The aim of this study was to evaluate the prevalence of midface fractures among different age groups.

MATERIALS AND METHODS

Study Setting

The study was conducted with the approval of the Institutional Ethics Committee. The study consisted of one reviewer, one assessor and one guide.

Study Design

The study was designed to include all the patients who reported the Department of Oral and Maxillofacial surgery with a chief complaint of facial fracture. The inclusion criteria was all the midface fracture cases that were treated regardless of the age within the review period. The exclusion criterias included patients with a history of repeated admission, patients with any underlying pathological problems, patients with any genetic/congenital abnormalities.

Sampling Technique

The study was based on consecutive sampling. To minimise the sampling bias all the patients who underwent treatment for midface fractures were reviewed and included.

Data Collection

Data collection was done using the patient database with the time framework of 2nd July - 25th March 2020. About 32,300 case sheets were reviewed and those fitting under the inclusion criteria were included. Cross verification of data was done by a reviewer. The collected data was tabulated based on the following parameters

- The aetiology of the injury
- The anatomical site involved
- The age of the patient

Statistical Analysis

The variables were coded and the data was imported to SPSS. Using SPSS version 20.0, categorical variables were expressed in terms of frequency and percentage, and bar graphs were plotted. The statistical significance of associations were tested using the Chi-square test.

RESULTS AND DISCUSSION

Midface fractures are known to cause severe facial deformities which eventually affects the appearance of the individuals facial features (Patturaja and Pradeep, 2016; Abhinav *et al.*, 2019; Ravikumar and Bhoj, 2019). This type of facial fracture is associated with various other comorbidities such as blindness, deviated nasal septum including loss of function of various parts in the head and neck region (Prein, 2012; Rahman and Santhoshkumar, 2017). Midface fractures should be addressed immediately for the well being of the patients (Marimuthu *et al.*, 2018). From the data obtained from this study 25 patients reported with a chief complaint of midface fracture. The maximum number of midface fractures is observed in individuals greater than 31 years. The most commonly observed fracture in the midface region is the dentoalveolar fracture. This was followed by the zygomatic complex fracture which included the infraorbital rim, frontozygomatic suture and sphenozygomatic sutures (Figure 1). Road Traffic accidents were considered as the most important cause of maxillary fracture. Most of the patients were treated surgically but a few of them were treated conservatively.

In our study it was found that road traffic accidents are found to be the causative factor for midface fractures (Mahipathy *et al.*, 2017; Sweta, Abhinav and Ramesh, 2019). Various other multicentric studies conducted in Australia, Japan also has quoted that RTA is the most important causative factor for midface fracture (Bardale, 2011). Study conducted by Bocchidini *et al* indicates that 20% of the midface fracture is due to Road Traffic Accidents and 14.4% by assault and sports accounted for about 14.1% (Packiri, Gurunathan and Selvarasu, 2017). In accordance with the study conducted by Linas Zaleckas *et al*, the frequent cause of midface fracture was interpersonal violence in developed countries (Mp, 2017). Results of our study support the fact RTA is the most common cause for midface fracture (Leichenko and Ya. Leichenko, 1974)(Wolfe, 1982).

Our study indicates that midface fractures are most common in individuals greater than 30 years of age. A total of 52% of the individuals represented a population who belonged in the category of greater than 30 years. Dentoalveolar fracture (24%), zygomatic complex fracture (24%) and nasal bone fracture (4%) were observed in these individuals. Dentoalveolar fracture (24%), zygomatic complex fracture (1%) and nasal bone fracture (4%) were observed in individuals between the age group of 18 - 30 years. This accounted to about 44% of the total population. Out of all the 25 cases reported, there was one case reported where the individual was less than 18 years of age and dentoalveolar fracture was observed [Figure 2]. The study by Karikal *et al* indicated that midface fractures are more common in the 3rd decade of life followed by 4th and 6th decade (Patil *et al.*, 2017). Several also have similar findings which stated that middle aged individuals are the ones most prone for mid face fracture due to their constant involvement in outdoor activities (Patturaja and Pradeep, 2016) (Rowe and Killey, 1968) (Menon, Karikal and Shetty, 2018).

In our retrospective study, dentoalveolar fracture of the midface region was the most common fracture observed in the maxilla followed by zygomatic complex fracture [Figure 2]. A study conducted by Kotech Priyank stated that most of the cases observed by them were dentoalveolar fractures followed by zygomatic complex fracture (Verma, Parmar and Carter, 2018), which was in accordance with our study. Syed Amjad *et al* also quoted that zygomatic complex 48.2% was the most susceptible site for midface fracture (Kumar, 2017).

Midface fracture can be treated either by closed reduction (conservative) or surgical approaches which include open reduction and fixation using miniplate (Mahipathy *et al.*, 2017), a combination of approaches can also be practiced (Dorafshar, Rodriguez and Manson, 2019). Midface fracture management can also be considered as an interdisciplinary management (Rao and M.P. Santhosh kumar M.D.S, 2018). In our study the majority of the treatment done was open reduction and fixation. Conservative approach was performed in cases of dentoalveolar fracture, which also comprised intrusion of certain teeth (Samsudin, 2007) (Santhosh Kumar and Sneha, 2016;

Ravikumar and Bhoj, 2019). The type of treatment which needs to be adopted depends on the type and site of injury, the prognosis and surgeons choice (Motamedi, 2016; Santhosh Kumar and Sneha, 2016; Jain, Muthusekhar and Baig, 2019).

CONCLUSION

From this small sampled single centre retrospective study it is very evident that midface fracture were mostly contributed by road traffic accidents in middle aged males who are dominantly breadwinners ,not following road safety. A large sampled multicentered study is mandatory to implicate the outcome of this study in the field of maxillofacial trauma management.

Authors Contribution

Dr Soya Alfred Xavier, Author contributed in the conception, design, acquisition of data, analysis, drafting the article and interpretation of data.

Dr Abdul Wahab and Dr.Sivakumar M, Author(s) contributed in guiding, revising it critically for important and intellectual content, author made contributions to final approval of the submitted version of the manuscript and supervision.

Conflict of Interest

No conflict of interest.

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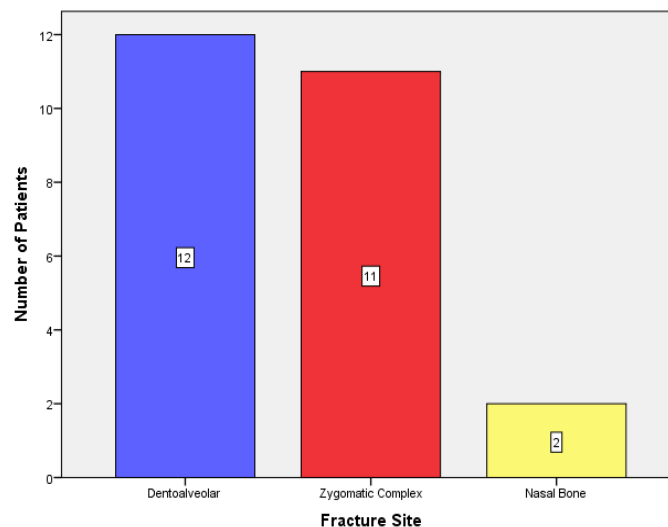


Fig.1:This graph denotes the frequency of the fracture which occurred in individuals. The X axis represents the fracture site and the Y axis represents the number of patients. Dentoalveolar fracture (red) was the most commonly occurring fracture followed by zygomatic complex fracture (blue).

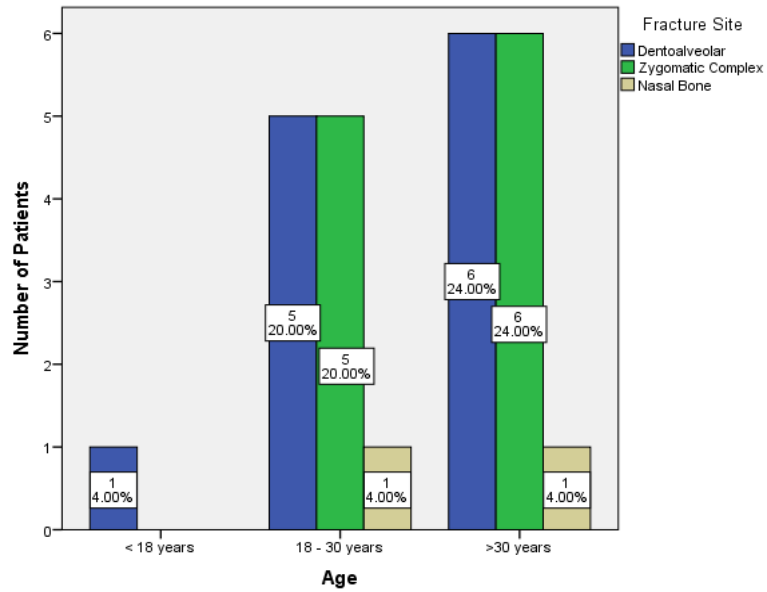


Fig.2: This graph indicates the association between the age and the mid face fracture. The X axis denotes the age of the patient. The Y axis denotes the number of patients. It was observed that the majority of fractures occurred in individuals greater than 30 years of age, followed by individuals belonging to age group 18 - 30 years. Association tested by Chi Square test, p value = 0.4 (p value > 0.05). Statistically not significant. Though there is no association between the age of the patient and midface fractures, few had a tendency to occur when greater than 30 years of age.