Original Article

Patterns of Orbital Fracture and Association with Other Mid Face Fractures: A Retrospective Study

Maxillofacial Surgery

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ABSTRACT

Introduction: Orbital fractures are among the most frequent of the middle facial injuries. Orbital fractures are seen as an isolated orbital floor or wall fracture, or as a part of middle facial injuries. Trauma severity ranges from isolated orbital floor or wall fractures to a degree of distruption that involves other middle facial fractures which require immediate surgical intervention.

Objective: To analyze the pattern of orbital floor fractures and association with other mid face fractures.

Study Design: Retrospective study

Place and Duration of Study: This study was conducted at Oral and Maxillofacial surgery department Liaquat University hospital Hyderabad from January 2012 to December 2012

Materials and Methods: 257 patients, who had sustained middle facial bone fractures were included. Data collected included age, gender, pattern of orbital fractures and its association with other middle facial injuries. Data was collected through records of patient's clinical examination and imaging investigations e.g. Plain radiographs OPG, P.A View of face, occipitomental view and CT scan if necessary . Data was analysed by SPSS 17 software.

Results: In this one year study, we received 257 patients of middle facial trauma, out of those 257 patients 78 cases (30.35%) involved orbital fractures. Orbital floor with lateral wall (39.74%) was the most susceptible pattern of fracture followed by lateral wall (26.64%) fractures & orbital floor fracture with medial wall involvement (14.10%). Zygomatico-maxillary complex fracture (62.82%) was the most commonly associated with orbital fractures among other middle facial injuries followed by Lefort III (35.41%).

Conclusion: Orbital fractures should be considered during examination of trauma patients especially in case of middle facial injuries. . It is suggested that all cases of middle facial injuries associated with orbital fractures should have an immediate diagnosis and early management to decrease the complications.

Key Words*:* orbital fractures, mid face fractures, pattern, association.

INTRODUCTION

The human face is a individual esthetic identification. Loss of facial esthetics due to facial fractures are more common today with increasing road traffic accidents. There are can be other etiological factors like interpersonal violence, falls, sports injuries and industrial trauma[1,2]. Maxillofacial fractures occur as a result of traumatic forces, in isolation or concomitantly with other injuries of the body.

The orbital trauma is a public health concern, not only due to the high prevalence in middle facial fractures, but primarily due to its impact on quality of life of patients, providing psychological and physical discomfort[2].

The orbit is a bony cavity which lodges the globe of eye; being formed by four bony walls the lateral, medial, floor, and roof. The orbit has particular anatomical articulations, allowing the occurrence of different patterns of fractures when it gets trauma[1].

Orbital fractures can result in considerable facial deformity. Orbital fractures are among the most frequent of the middle facial injuries. Orbital fractures are seen as an isolated orbital floor or wall fracture, or as a part of middle facial injuries. Trauma severity ranges from isolated orbital floor or wall fractures to a degree of disruption that involves other middle facial fractures which require immediate surgical intervention. Isolated orbital floor fracture, is not that common pattern as other patterns of orbital fracture e.g. orbital floor fractures associated with the lateral buttress and orbital rim, also known as tripod fractures or injuries involving the other middle facial bones. Rarely, pure isolated orbital floor fractures do occur, mostly with direct blunt trauma to the orbit[2,3,4].

The purpose of this study was to present our experience with orbital fractures regarding its patterns of injuries and its association with middle facial fractures[5,6,7] .Better understanding offers proper evaluation of the patients in clinical examination and ordering appropriate investigations of the involved orbital fracture[8]. Timely diagnosis and surgical intervention of orbital floor fractures can reduce the base line

complications and can prevent any permanent functional or cosmetic complaints[8,9,10].

MATERIALS AND METHODS

This retrospective study was conducted at Oral & Maxillofacial Surgery Department, Liaquat University Hospital, Hyderabad. In this study we received 257 patients, who had sustained middle facial bone fractures. Data collected included age, gender, pattern of orbital fractures and its association with other middle facial injuries. Data was collected through records of patient's clinical examination and imaging investigations e.g. Plain radiographs OPG, P.A View of face, occipitomental view and CT scan if necessary . Data was analyzed by SPSS 17 software.

RESULTS

In this one year study, we received 257 patients of middle facial trauma, out of those 257 patients 78 cases (30.35%) involved orbital fractures. (Figure 1)

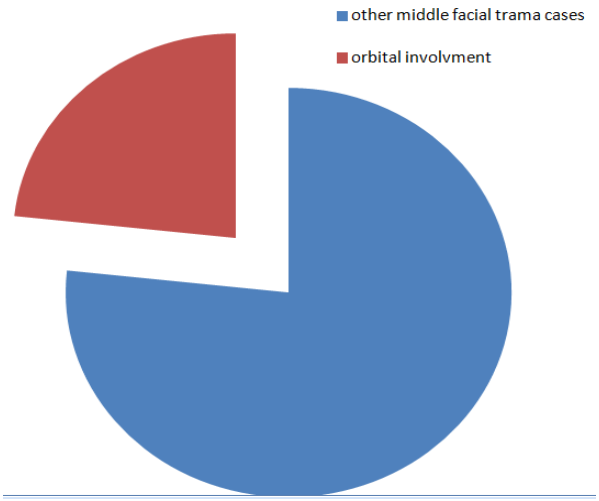

Figure No.1: Percentage of orbital fractures from middle facial trauma cases.

Orbital fractures were far more prevalent in males (88.46%; 69/78) than females (11.53%; 9/78). The male to female ratio was 7.6:1. (Figure 2) The extremes age in this study range from 4 to 64 years.

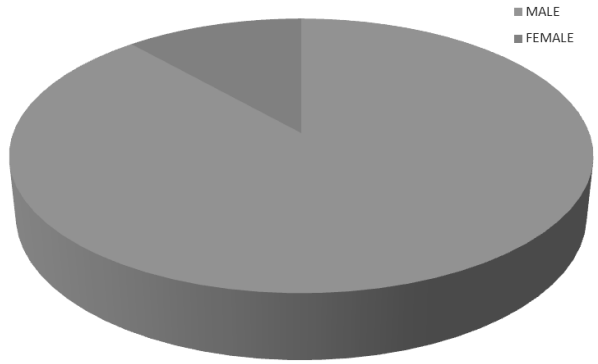

Figure No.2: Gender wise distribution of orbital fractures

Regarding pattern of orbital fracture, we reported that out of 78 cases, 31 cases (39.74%)of orbital floor fracture with lateral wall involvement, 20 (26.64%) cases of with lateral wall involvement, 11cases (14.10%) of orbital floor fracture with medial wall involvement, 10 cases (12.82%) of medial wall involvement, 4 cases (5.12%) were involving orbital rim with associated orbital floor as well as medial and lateral orbital walls fractures, only two cases (2.56%) of isolated floor orbital fracture were reported . (Figure 3)

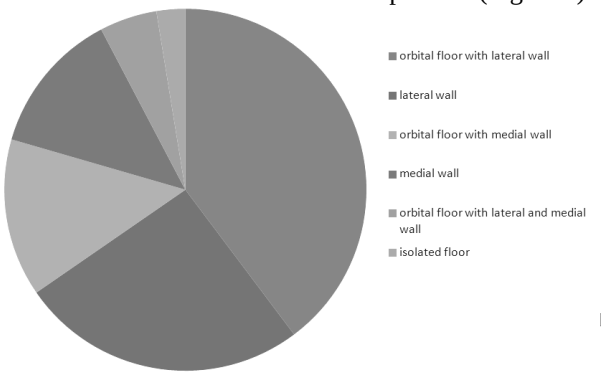

Figure No.3: Patterns of orbital fractures

Regarding association of orbital fractures with other middle facial injuries, we reported that out of 78 cases of orbital fracture 49 cases (62.82%) were associated with zygomatic complex, 17 cases (35.41%) were associated with Lefort III, 7 cases (8.97%) were associated with nasoethmoidal fractures, 3 cases (3.84%) were associated with Lefort II were noticed . Only two cases (2.56 %) of isolated orbital floor fracture out of 78 cases of orbital fracture. None of them was associated with Lefort I. (Figure 4)

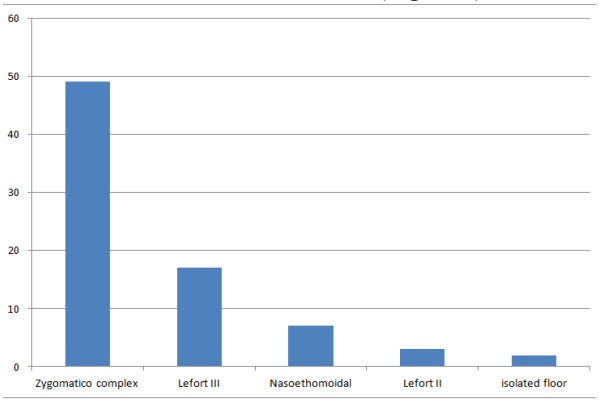

Figure No.4: Association of orbital fractures with other middle facial injuries, according to number of patients reported

DISCUSSION

Facial bone fractures are one of the most common injuries and draw special attention from a great number of clinicians. Therefore, many reports analyzing these fractures have been presented. The findings of those analyses vary according to their timing and

geographical region, which in turn relates to social, economic and cultural distinctions[11]. Orbital fractures have been described as one of the most common traumatic fractures in our population[12].Isolated orbital wall fractures accounts for 4 to 6% of all facial fractures. If fractures that extend outside the orbit are included, such as those of the zygomatic complex and orbito-nasoethmoidal ,then this accounts for 30 to 55% of all facial fractures[13,14,15].

An internal orbital fracture occurs in various patterns. This study clearly shows that the cases of orbital fracture frequently follow the pattern of lateral wall and floor fractures. Isolated fracture of orbital floor seems to be rare. As the bones of the roof and lateral wall are relatively strong, blunt trauma to the orbit may be associated with the fracture of its floor[16,17,18].

As other studies shows orbital fractures were most commonly involved with zygomatico complex fractures. The Zygomactico complex often hinges about the zygomaticofrontal suture with an inferior, posterior and medial vector of rotational displacement[19,20]. This is due to the force and direction of blunt trauma and the non-uniform thicknesses of the components of the zygomaticomaxillary complex. The zygomaticofrontal area offers the thickest pillar. When fractured, there is usually a slight vertical displacement with a reasonable antero-posterior direction. The much thinner lateral orbital floor and anterior maxillary offers little resistance to fracture and displacement[21,22].

Severe trauma cases are associated with Lefort III and Lefort II fractures. This study reported severe trauma cases in bulk so the number of Lateral wall involvement and Lefort III fractures were high. Nasoethamoidal complex fractures associated with orbital fractures especially in case of severe blunt trauma[23,24].

Surgical intervention of orbital fractures is based on the pattern of injury and its association with other middle facial fractures [23,24].This study stressed that orbital fractures should be considered during examination and investigation of middle facial fractures and treated to prevent the functional and cosmetic complications.

CONCLUSION

Orbital floor with lateral wall (39.74%) was the most susceptible pattern of fracture followed by lateral wall (26.64%) fractures & orbital floor fracture with medial wall involvement (14.10%). Zygomactico-maxillary complex fracture (62.82%) was the most commonly associated with orbital fractures among other middle facial injuries followed by Lefort III (35.41%).

Orbital fractures should be considered during examination of trauma patients especially in case of middle facial injuries. It is suggested that all cases of middle facial injuries associated with orbital fractures should have an immediate diagnosis and early management to decrease the complications.

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