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RESEARCH ARTICLE

A Retrospective Analysis on the Facial Bone Fractures at a Tertiary Care Centre

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Abstract

Background: With the rise in road traffic accidents, there has been an increase in facial trauma involving facial bone fractures. This study is aimed at analysing the types of facial bone fractures. **Methods:** 123 patients belonging to different etiologies, age groups and genders with facial bone fractures who were treated at our centre at Government Kilpauk Medical College Hospital, Chennai, from January 2023 to December 2023, were considered for the study. Patients who lost follow-up and discontinued treatment were excluded from the study. **Results:**1255 patients presented with plastic surgical emergencies during the study period, of which 123 patients had sustained facial bone fractures with an incidence rate of 9.8%. As per the study, the most common fractures are as follows in the decreasing pattern of incidence, namely mandible, zygomaticomaxillary complex, nasal bone and orbital fractures, respectively. The majority of the study population were men belonging to the age group of 20 to 40 years. The majority of the patients presented with unilateral involvement. Road traffic accident was found to be the most common etiological factor, with 84 patients in the group. 116 out of 123 patients underwent surgical management in the form of open reduction and internal fixation, whereas 7 underwent conservative management. **Conclusion:** The majority of the study population were men belonging to the age group between 20 and 40 years, with road traffic accidents as the main etiological factor. Mandibular fractures were the most common facial bone fracture found in the study.

Keywords: Chennai, Facial Bone Fracture, Retrospective Study, Road Traffic Accidents, Unilateral

1. Introduction

Facial bone fractures have been on the increasing trend due to road traffic accidents[1]. A thorough facial examination and early surgical management[1,2] after stabilisation of the patient's general condition hold the key to better functional and aesthetic outcomes. Most of the patients present with malocclusion, trismus, step deformity, periorbital edema, and subconjunctival hemorrhage. Other clinical presentations are diplopia, telecanthus, enopthalmous, anesthesia over infraorbital area or lips, nasal congestion, flattening of malar prominence, bleeding from the ear, nose, or mouth, loss of dentition, sublingual hematoma, and injury to cranial bones and soft tissue.

2. Aim and Objectives

2.1 Aims

To study the incidence, aetiological factors, age and gender wise distribution, management of facial bone fractures at our centre.

2.2 Objective

The objective of this study is to analyse the data collected and spread awareness on the need for road safety measures. This study also infers the significance of restoration of facial symmetry following trauma and the need for surgical correction in order for better functional and aesthetic outcomes.

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3. Review of Literature

Automobiles were invented many years ago. The aetiology for facial bone fractures are road traffic accidents, assault, home and industrial accidents, domestic violence, falls especially in elderly, athletic injury[1-3]. The nasal bone[2,4] is the most common isolated bone to be fractured, followed by the mandible[2]. Facial bone fractures are classified into[2,5] 1. Upper facial fractures involving the frontal bone and sinus, 2. Orbital fractures, 3. Midface - Le forte fractures, 4. Lower facial fractures involving mandibular fracture[1,2]. The face has vertical and horizontal buttresses, where bone thickness is more to neutralise the forces applied to it[2,5]. The vertical buttresses consist of the nasal septum in the midline and the nasomaxillary, zygomaticomaxillary, and pterygoid buttresses. The horizontal buttresses of the midface consist of the inferior orbital rim and orbital floor, zygomatic arch and the palate at the level of the maxillary alveolus. Reduction and fixation of these key areas are the basis of maxillofacial reconstruction.

- The indications for surgery in an orbital fracture are double vision, Radiographic evidence of extensive fracture, enophthalmos or exophthalmos, visual acuity deficit implying that optic canal decompression may be indicated, Blow-in orbital fractures. The Goals of surgical management are To release and reposition the entrapped structures into its normal anatomy and To restore the orbital shape and volume[2].
- The Midfacial fractures were classified by RENE LEFORT in 1901. The classification is as follows, Le fort I is a Low level fracture also known as Guerin fracture. Le fort II is a Pyramidal or Subzygomatic fracture. Le fort III is a High transverse or supra zygomatic fracture, otherwise known as a Craniofacial disjunction. Goals of surgery are to restore midfacial height and projection, achieve occlusion, and restoration of the integrity of the nose and orbit[2].
- Indications for lower facial bone fracture fixation are Favourable or unfavourable class I fracture where stability is desired, Class II and III fractures -"Kazanjian and Converse", Communited fractures, displaced fractures and those subjected to rotation, edentulous fractures, combined facial bone fractures[2,6].

4. Material and Methods

Datas of all the patients belonging to various gender, age groups and aetiology with facial bone fractures who were treated at our centre at Government Kilpauk Medical college Hospital between January 2023 to December 2023 were considered for this retrospective study.

Inclusion Criteria: Patients of all age group, gender and aetiology with facial bone fractures. Patient who underwent surgical management and were on regular follow up. Patients who were managed conservatively and were on regular follow up.

Exclusion Criteria: Patients who lost follow up and discontinued treatment.

Our institutional protocol in management of facial bone fractures: Stabilisation of patient's airway, breathing, circulation was done. In case of poor Glasgow coma scale patients were intubated. Extraoral and intraoral clinical examination was done to look for restricted mouth opening, bony tenderness, step deformity, vision assessment, diplopia, loss of extra ocular movements, soft tissue injury, loosened or loss of dentition, malocclusion, position of tongue, sublingual haematoma - Coleman sign, fracture line tenderness, soft tissue injury. Imaging in the form of CT facial skeleton(axial, sagittal, coronal bone windows, axial soft tissue window) and 3D reconstruction was done. Further imagings (CT brain, CT abdomen, X-rays of extremities or long bones) and spine and their respective specialist's opinion was sought as per the routine trauma assessment. Anti oedema measures such as head end elevation, injection Dexamethasone 4mg i.v 12th hourly, tablet Serratiopeptidase thrice daily liquified in water were followed. Chlorhexidine mouthwash 3 to 4 times daily was given to maintain oral and dental hygiene. Patients were put on liquid and non-chewable diet. Routine blood investigations (complete blood count, liver and renal function test, electrolytes, blood coagulation profile, serology) was done. Selection of patients for fracture fixation were favourable fractures with desired stability, malocclusion, trismus due to the fracture, comminuted fracture segments and other signs such as diplopia, infraorbital anaesthesia due to nerve entrapment and disfigurement. Selection of patients for non-surgical management were maintained occlusion and surgically unfit patient.

Reduction and fixation of the buttresses are the basis of maxillofacial reconstruction. Patients were managed with Erich Arch bar with Mandibulomaxillary Fixation (MMF) for 3 weeks, followed by arch bar removal at the 4th week for favourable fractures with maintained occlusion. Other categories with malocclusion were managed with Mandibulomaxillary Fixation (MMF), open reduction and internal fixation using plates and screws. 24 to 48 hours post procedure, inter maxillary fixation was applied and was retained for 3 weeks. The arch bar was removed at the 4th week. In certain scenarios such as[2] nasal bone fractures were addressed with closed reduction, zygomatic arch fractures were addressed using Gillies approach and mandibular fracture fixation was done along the Champy's line of osteosynthesis. X-ray of the face were taken in the immediate post-operative and follow-up periods. Patients were followed up for 6 months. During the follow-up period, patients were examined for oral hygiene, adequate mouth opening and occlusion, along with signs of wound healing. Completion of treatment is marked by occlusion with healed fracture and wound. Some of the cases performed at our centre has been depicted in Figures 1, 2 and 3.

5. Results (Including Observations)

The collected data were analysed and the below results were obtained. The total number of patients with plastic surgical emergencies was found to be 1255. The total number of patients with maxillofacial fracture were found to be 123. Incidence of maxillofacial fracture was found to be 9.8 %.

Graph 1 shows the anatomical distribution of facial bone fractures as per the study in the decreasing order of occurrence with majority belonging to the mandibular fracture group with 81 patients, followed by zygomaticomaxillary complex with 19 patients, nasal bone with 15 patients and orbit with 8 patients.

Graph 2 shows the side wise distribution of maxillofacial fractures with 69 of 123 patients sustaining unilateral fracture with left more than right. 35 out of 69 patients sustained injury to the right side, followed by 34 patients on the left side.

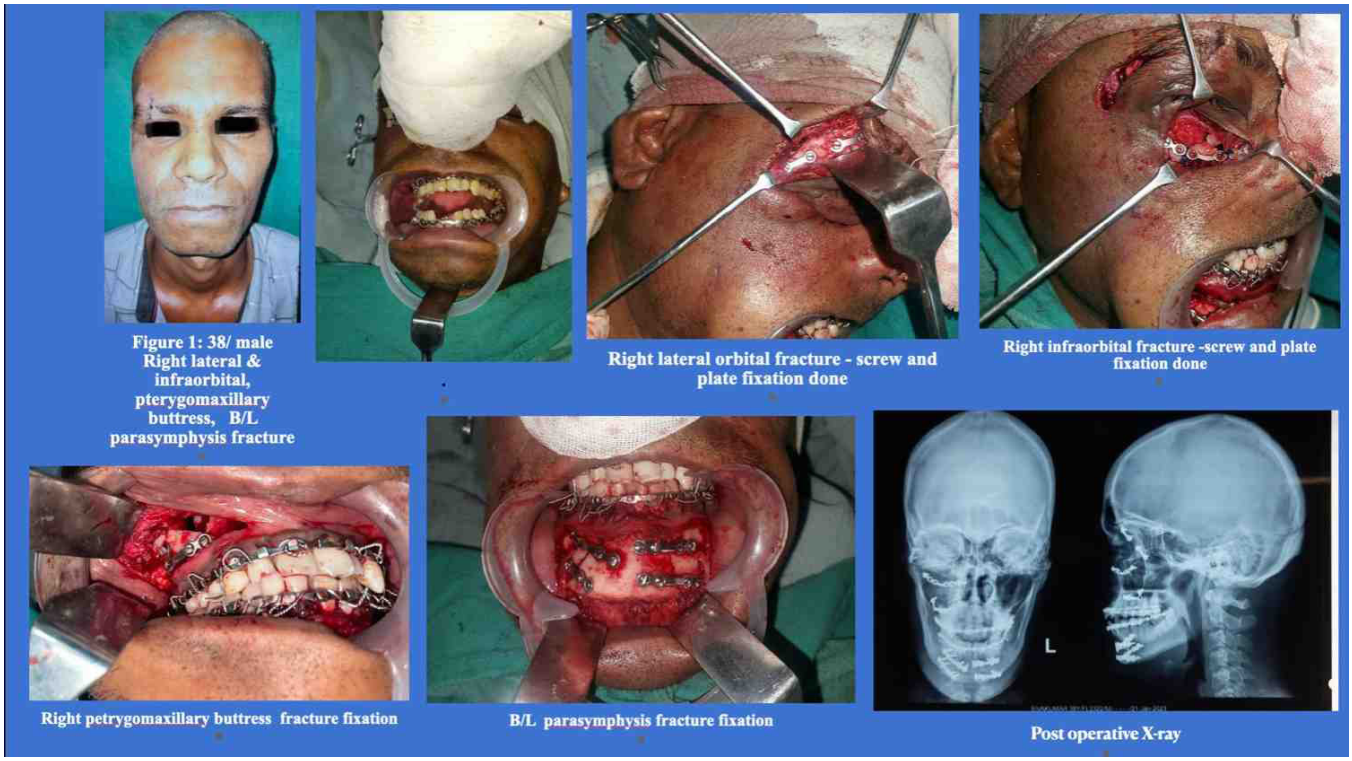


Figure 1. (Case 1) Right lateral and infraorbital pterygomaxillary buttress, bilateral parasymphysis fracture- Open reduction and internal fixation done.

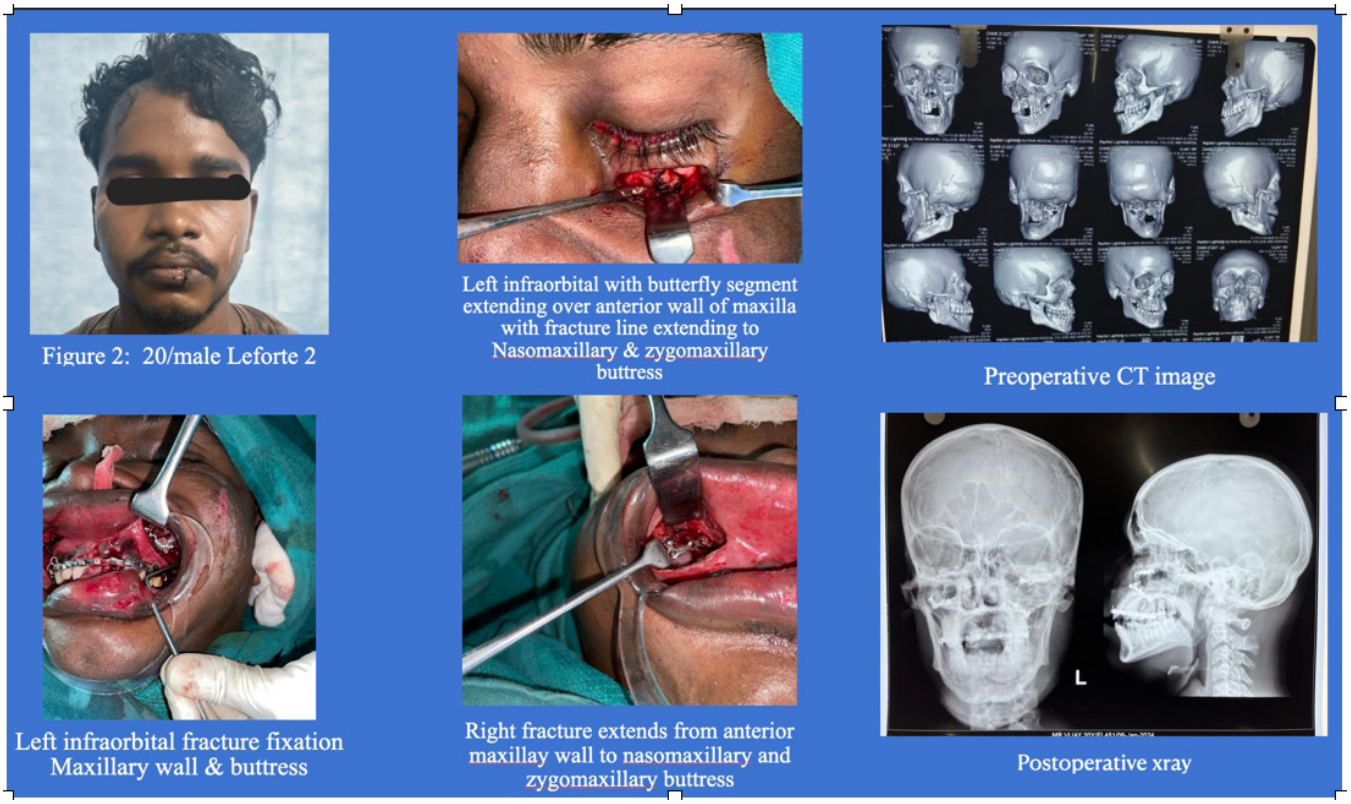
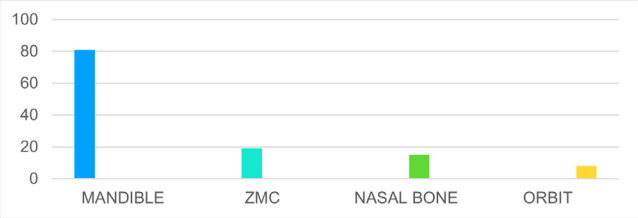
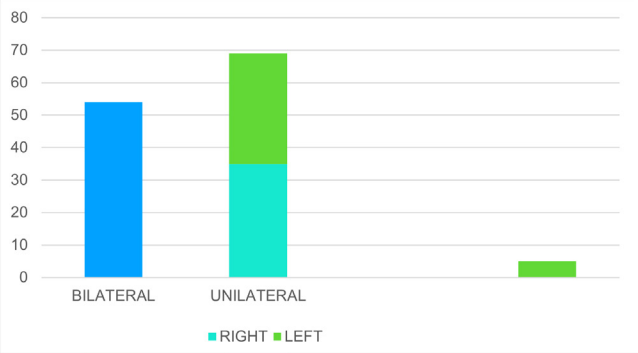


Figure 2. (Case 2) Leforte 2 fracture - Open reduction and internal fixation done.

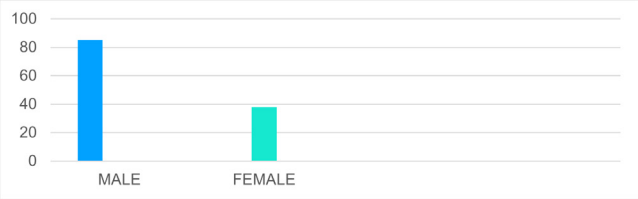
Figure 3. (Case 3) Panfacial fracture - Open reduction and internal fixation done.



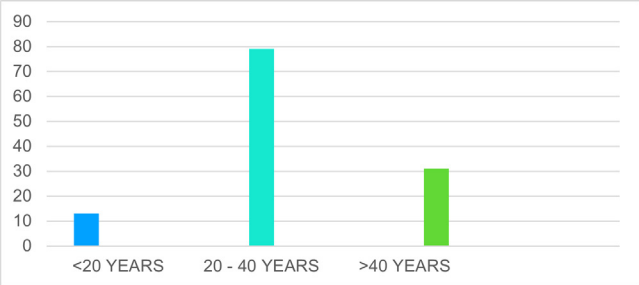
Graph 1. Anatomical distribution.



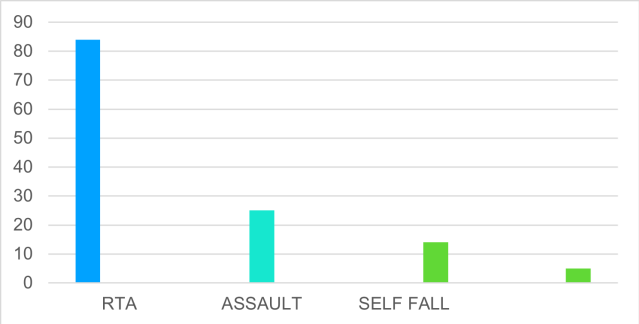
Graph 2. Side wise distribution of maxillofacial fracture.



Graph 3. Gender wise distribution.



Graph 4. Age wise distribution.



Graph 5. Aetiological distribution.

Graph 6. Management wise distribution.

Graph 3 shows the gender wise distribution, with 85 of 123 patients being male and 38 being female.

Graph 4 shows the age wise distribution with 79 out of 123 patients belonging to the age group between 20 and 40 years, 31 patients above 40 years and 13 patients below 20 years. The minimum and maximum age group were found to be 16 and 73 years, respectively.

Graph 5 shows aetiological distribution pattern. 84 out of 123 patients sustained injuries due to road traffic accident, followed by 25 due to assault, 14 due to self fall.

Graph 6 shows that 116 out of 123 patients underwent surgical management in the form of open reduction and internal fixation, whereas 7 underwent conservative management.

Post-operative period was eventful in 8 patients with infection as the main contributory factor. 5 out of 7 patients recovered with conservative management whereas 1 patient underwent implant exit, 1 patient had malocclusion due to extensive preoperative injury, but patient was satisfied with the postoperative status.

6. Discussion

The incidence rate of maxillofacial fractures at our centre was found to be 9.8%. The majority of the affected group presented with mandibular fractures sustained due to road traffic accident, with male predominance[1,2,6]. In recent times, there has been violation of traffic and road safety rules, thus leading to an increase in road traffic accidents. The mandible due to its anatomy is prone to fractures, despite it being the

strongest facial bone. The most common age group that was affected was between 20 and 40 years of age, with 79 patients contributing to the major study population. People belonging to the age group between 20 and 40 years are the ones affected by physical and psychosocial stress the most, hence reflecting it on driving as one of the multiple ways of doing so. The above explanation also holds true for the male predominance. The majority of the patients were managed surgically. Post-operative period was eventful in 8 patients with infection as the main contributory factor. 5 out of 7 patients recovered with conservative management whereas 1 patient underwent implant exit and 1 patient had malocclusion due to extensive preoperative injury, but the patient was satisfied with the postoperative status. Main aim of surgery is to restore the function. Restoration of aesthetics is secondary[2].

7. Summary and Conclusion

Road traffic accident has led to an increase in the incidence of facial bone fractures. Facial bone fractures are found commonly amongst male and in young adulthood. Early surgical fracture fixation has better functional and aesthetic outcome. As Prevention is always better than cure, road safety measures have to be emphasised and followed vigilantly.

8. References

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