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A RETROSPECTIVE DESCRIPTIVE STUDY OF EPIDEMIOLOGY OF FRACTURES OF MAXILLA IN TERTIARY CARE HOSPITAL OVER A PERIOD OF THIRTEEN YEARS

Plastic Surgery

Dr. Pokkula Ramesh — Associate Professor, Department of Plastic Surgery, Gandhi Medical College, Secunderabad, Telangana, India.

Dr. Erugurala Mahendar* — Assistant Professor, Department of Plastic Surgery, Gandhi Medical College, Secunderabad, Telangana, India *Corresponding Author

Dr. Arige Subodh kumar — Professor and Head of the Department, Department of Plastic Surgery. Gandhi Medical College, Secunderabad, Telangana, India.

Dr. Vijay Chandra mouli — Postgraduate, Department of Plastic Surgery, Gandhi Medical College, Secunderabad. Telangana, India.

Rajit Pokkula — Medical student, Hyderabad, Telangana, India.

ABSTRACT

INTRODUCTION: Maxilla is an important mid-facial bone, common bone to be injured which needs correction.
AIM : To analyse the cause, age, gender incidence, sites of fracture and combinations , management modalities adopted.
METHOD AND MATERIALS: 403 patients at Gandhi hospital during 2005-2017 were studied.
RESULTS & DISCUSSION The annual incidence ranged from 18.11 % to 46.47 % of the total facial fractures. 88.83%, 78.66%, 44.41%, 32%, 51.86% were males, due to RTA, aged between 21-30 years, Le-fort I fractures, on the right side respectively. ORIF was done in 66.50 % . Infection , plate exposure were noted in 8.67 % .
Class –I occlusion was achieved in 84.11 % and in the 5.88%, the malocclusion was corrected with either stainless steel wires (6.69%) or elastic bands (5.45%) or re do ORIF (3.72 %).

KEYWORDS

Maxilla Fracture, Le-forte Fracture, Rta, Orif, Dental Occlusion , Imf.

MAIN ARTICLE:
Maxilla is one of the facial bones responsible for facial contour. Fracture and dislocation of this bone causes cosmetic defects apart from disrupting ocular and mandibular functions. Being one of the prominent bones of the face, predisposes it to various trauma. The architecture of this bone enables it to withstand blows with significant impact without being fractured and hence it gets mostly disarticulated along its suture lines.

Classification of maxillary fractures[1,2]:
Le-forte I fractures: Transverse one separating the maxillary alveolus from the upper mid-face.

Le-forte II fractures: Pyramidal one, separates a pyramid-shaped central fragment containing the maxillary dentition from the remainder of the orbits and upper craniofacial skeleton.

Le-forte III fractures: Canio-facial dysjunction, separates the maxilla at the level of the upper portion of the Zygoma, orbital floor, and the naso-ethmoid region from the remainder of the upper cranio-facial skeleton.

Importance of facial buttresses in fracture of middle third of face:
The buttress system of mid face is formed by strong frontal, maxillay, zygomatic and sphenoid bones and their attachments to one another. The central mid face contains many fragile bones that could easily crumble when subjected to strong forces. These fragile bones are surrounded by thicker bones of the facial buttress system lending it some strength and stability[3].

The fractures of Maxilla should be repaired at the earliest to prevent functional and cosmetic defects like occlusion and facial symmetry.It is also important to reduce this fracture and fix it accurately, Accurate assessment of position of the fractured bone should be performed in relation to skull base posteriorly and midface anteriorly. This assessment is very important before reduction is attempted to ensure accurate reduction of the fractured fragments. Facial fractures are common in cities due to heavy traffic and high incidence of violence. The causes, types, and sites of these fractures seem to vary across geographical location.

Different studies have shown a relationship between maxillofacial fractures, defined sex and age groups, level of mechanization and development.[4-8]

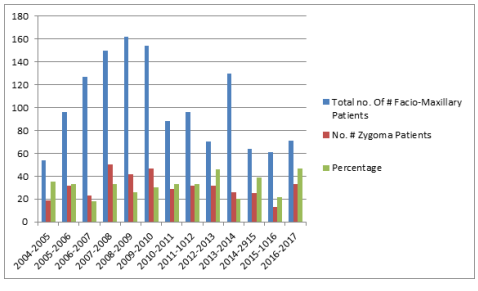
MATERIAL AND METHODS:
We did a retrospective study of all patients who were admitted and treated for facial trauma during the period between 2005-2017. All the patients with maxilla fractures had been included in our study. Those excluded from the study were patients with,

1) Age below 10 years and above above 70 years.
2) Patients with polytrauma.
3) Unstable patients with neurological problems.

All facio-maxillary fracture patients were initially admitted in trauma care ward. After they got stabilized, they were shifted to the Department of Plastic Surgery. Diagnosis was made on the basis of clinical examination and radiological examination. The data was analysed based on age, sex, site of fracture, side of the fracture, aetiology and management.

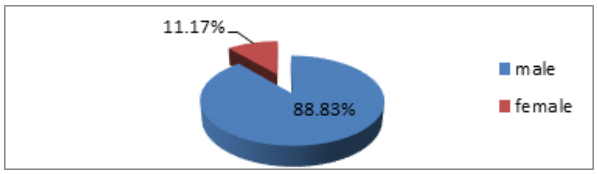
RESULTS:
During these thirteen years period, from 2005-2017, facio-maxillay injuries were 1323 and patients with Maxilla fractures were 403. The year-wise admissions of facio-maxillary fractures and maxilla fractures as shown in chart 1, shows a variable incidence between the years 2005-2017.

1.Chart showing incidence of fracture Maxilla cases



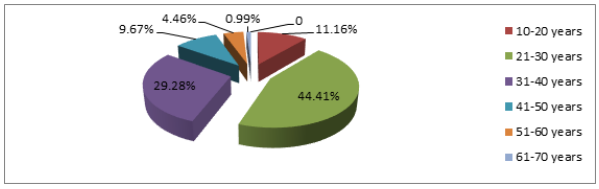
Males were commonly involved and accounted for 88.83 %, while females constituted 11.17 % as shown in chart 2. Males are more prone for trauma because of outdoor works, rash driving, and alcoholism.[9,10,11].

2. Chart showing gender distribution



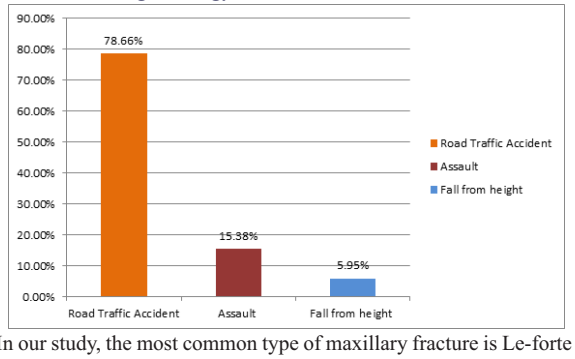
The most affected age group was 21-30 years.[12,13,14]Chart 3.

3. Chart showing age distribution



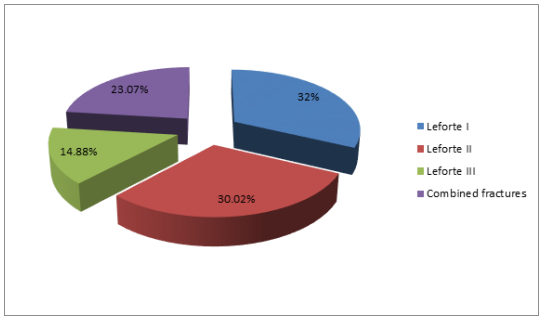
The most common cause of fractures was Road Traffic Accidents (RTA) , which accounted for 78.66 %. It was followed by Human and Animal assault with 15.38 % and fall from height with 5.95 %. Aetiological incidence is shown in chart 4. Alcohol consumption had been a compounding factor for fracture both RTA and Human assault.

4. Chart showing aetiology



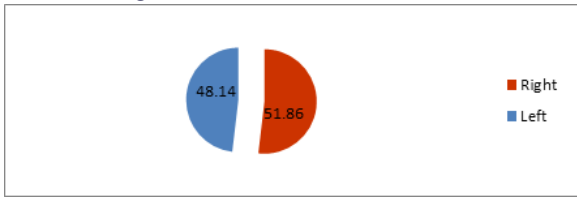
In our study, the most common type of maxillary fracture is Le-forte I (n=129) accounting to 32 %. Next common fracture was Le-forte II (n=121) cases equating 30.02 %, followed by Le-forte III type fracture (n=60) with 14.88 % and combined fractures (n=93) with 23.07 %. Chart 5.

5. Chart showing site of Maxilla fractures



Right side fractures (n=209) with 51.86 % are more in number than the patients with Left side fractures (n=194) with 48.14 %. Chart 6.

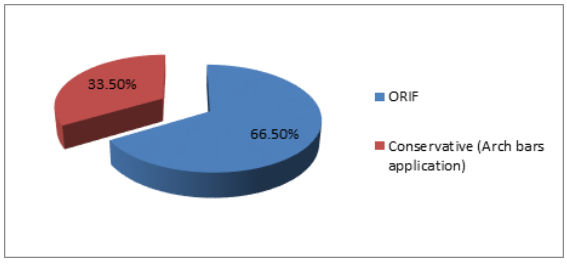
6. Chart showing side of Maxilla fractures



Methods of fracture reduction of maxilla were "Open reduction and internal fixation (ORIF)" in 66.50 %, and the rest of cases were managed conservatively 33.50%. Chart 7.

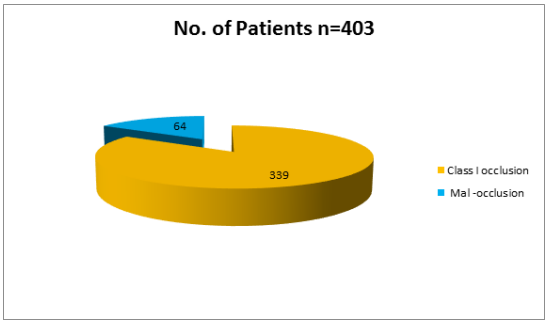
ORIF is usually done using four holed plate with gap or 3 holed plate with gap with 1.5mm thickness, and inter maxillary fixation (IMF).

7. Chart showing management



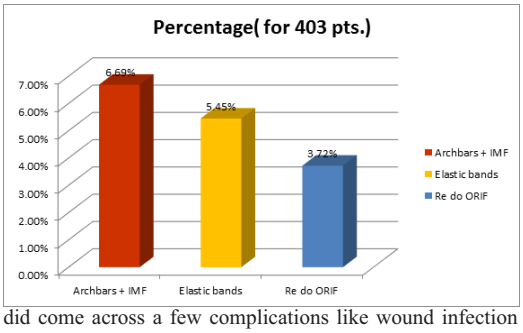
In the majority of cases (84.11), Class I occlusion was achieved and the rest of the patients with mal occlusion (15.88 %) were treated with readjustment of IMF with Stainless wires(6.69%) or elastic bands.(5.45 %) or Re do ORIF (3.72 %). Chart 8.

8. Chart showing result of surgery



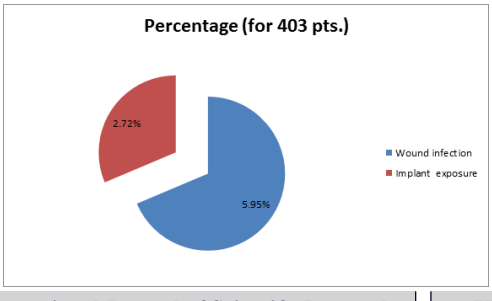
Most of the patients were discharged on the second or third post operative day and were followed every week in the out- patient department. Patients were advised liquid diet and avoid pressure on operation site and advised to sleep on non-operated side. Sutures were removed after one week. Dental occlusion or any loosening of wires is assessed at every out-patient visit. Corrective procedure for patients with mal-occlusion is shown in Chart 9.

9. Chart showing corrective surgeries

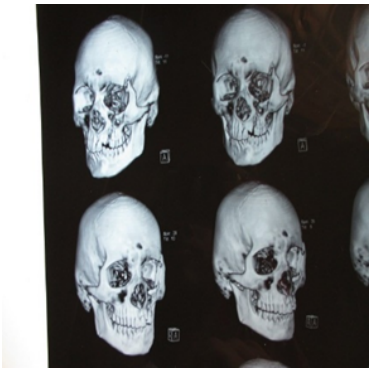


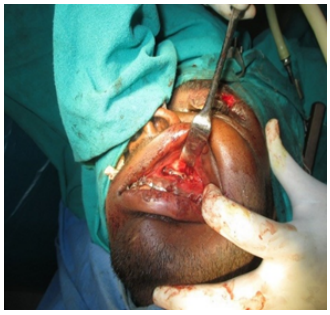
We did come across a few complications like wound infection and implant exposure shown in Chart 10.

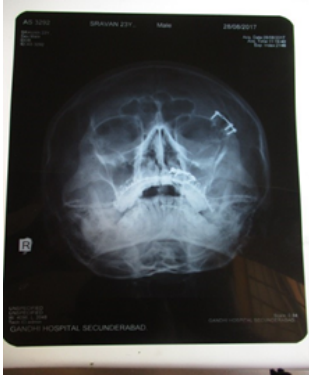
10. Chart showing complications



Very few patients who developed complications like wound infection (5.95%) and implant exposure (2.72 %) were treated with regular dressing and secondary suturing and implant removal and wound closure respectively.







DISCUSSION:

With increasing in population and urbanization in particular in cities of Telangana state in India, road traffic accidents are very common.

In this study, diagnosis of fracture was based on clinical examination, X-rays and 3D CT Facial bones. Computerized tomography was the most sensitive and specific imaging technique.

The results of our study regarding age, aetiology and management were compared with the study of Gustavo Halak Oliveira-Campos et.al[15] and Vibha Singh, et.al[16] of their study on maxillofacial injuries in India and abroad.

Most common age group involved in our study was between 21-30 years (44.41 %) and it was 38% in the study of Gustavo Halak Oliveira-Campos et. al and in the study of Vibha Singh et al, it was 37.66%.

Males were most commonly affected (88. 83 %) in our study and the same was noticed in study by Gustavo Halak Oliveira-Campos et.al where it was 90% and in the study of Vibha Singh et. al it was 89.69%. Most common cause of fracture Maxilla in our study was RTA (78.66 %) and in the study of Vibha Singh et. al., it was 97.10 %.

Most common method adopted for reduction of fracture Maxilla (66.50 %) in our study was comparable with the study by Gustavo Halak Oliveira-Campos et.al., where it was 60 % and in the study of Vibha Singh et al. it was 72.83%.

Most of the affected patients were of low and middle class income group. Alcoholism was the main culprit for the RTA. Rampant opening of Government run belt shops, wine shops along highways have been to be leading cause of accidents.

Our method of achieving class I dental occlusion by open reduction and internal fixation, arch bars and IMF with stainless steel wires.

Patients with reasonably good dental occlusion were treated with applying arch bars and IMF or conservatively.

We did come across some complications. Post operative oedema was common in all patients with ORIF. Wound infection was seen in 24 patients. They were treated with antibiotics , regular dressing and some cases with secondary suturing. Implant exposure was noticed in 11 patients post-operatively and the period ranged between 12 months to 24 months. Implant removal and wound closure done in these cases.

In patients with malocclusion , they were managed by Re-do ORIF , readjustment of IMF with Stainless wires or elastic bands.

CONCLUSIONS:

Road traffic accidents wer found to be the main cause for fractures of maxilla followed by assault. Le-forte I type was the most common type of fracture. Majority of the patients were males aged between 21and 30 years. Most of the cases were managed with ORIF and many of them achieved good dental occlusion.

The mind-set of the people, especially the youth should be changed with regard to following the safety norms of driving. People should be educated about the hazards of drunken driving, for the benefit of their own family members and for the society at large.

Government should focus on strict implementation of traffic rules and regulation. Police should be trained to enforce the law.

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REFERENCES

1. Grabb and Smith's Plastic surgery Textbook, fifth edition.
2. Stephen J. Mathes, Plastic Surgery, Second edition.
3. Menon A, Karikal A, Shetty V. Does C-Arm guidance improve reduction of zygomatic arch fractures. A randomized controlled trial. Journal of Oral Maxillofac Surgery 2018 Jun 1. pii: S0278-2391(18)30501-9.
4. Adriane Kamulegeya, Francis Lakor, and Kate Kabenge Oral Maxillofacial Fractures Seen at a Ugandan Tertiary Hospital: A Six-Month Prospective Study. IJPS Clinics (Sao Paulo). 2009 Sep; 64(9): 843–848.
5. Voss R. The aetiology of jaw fractures in Norwegian patients. J Maxillofac Surg. 1982;10:146–8. [PubMed]
6. Mwaniki DL, Guthua SW. Occurance and characterisics of mandibular fractures in Nairobi, Kenya. Br J Oral Maxillofac Surg. 1990;28:200–20.[PubMed]
7. Ajagbe HA, Daramola JO. Pattern of facial bone fractures seen at the university college hospital, Ibadan, Nigeria. East Afr Med J. 1980;57:267–73. [PubMed]
8. Güven O. A Comparative Study on Maxillofacial Fractures in Central and Eastern Anatolia. J Craniomaxillofac Surg. 1988;16:126–9. [PubMed]
9. Back CP, McLean NR, Anderson PJ, David DJ. The conservative management of facial fractures: Indications and outcomes. J Plast Reconstr Aesthet Surg. 2007;60:146–51. [PubMed]
10. Gassner R, Tuli T, Hächl O, Rudisch A, Ulmer H. Cranio-maxillofacial trauma: A 10 year review of 9,543 cases with 21,067 injuries. J Craniomaxillofac Surg. 2003;31:51–61. [PubMed]
11. Gupta R, Suryanarayan S, Sharma A, Pandya V, Sathaye S. Traumatic mandibular fractures: Pendulum towards closed reduction. The World Articles in Ear, Nose and Throat. 2010;3:1–3.
12. Al Ahmed HE, Jaber MA, Abu Fanas SH, Karas M. The pattern of maxillofacial fractures in Sharjah, United Arab Emirates: A review of 230 cases. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2004;98:166–70. [PubMed]
13. Malara P, Malara B, Drugacz J. Characteristics of maxillofacial injuries resulting from road traffic accidents—A 5 year review of the case records from Department of Maxillofacial Surgery in Katowice, Poland. Head Face Med. 2006;2:27. [PMC free article] [PubMed]
14. Adeyemo WL, Ladeinde AL, Ogunlewe MO, James O. Trends and characteristics of oral and maxillofacial injuries in Nigeria: A review of the literature. Head Face Med. 2005;1:7. [PMC free article][PubMed]
15. Gustavo Halak Oliveira-Campos, Leandro Lauriti,Marcos Kazuo Yamamoto, Rubens Camino Júnior, andJoão Gualberto C. Luz Trends in Le Fort Fractures at a South American Trauma Care Center: Characteristics and Management Journal Maxillofac Oral Surg. 2016 Mar; 15(1): 32–37. Published online 2015 May 26.
16. Vibha Singh, Laxman Malkunje, Shadab Mohammad, Nimisha Singh, Satish Dhasmana,1 and Sanjib Kumar Das The maxillofacial injuries: A study Natl J Maxillofac Surg. 2012 Jul-Dec; 3(2): 166–171.