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Journal of Oral Medicine, Oral Surgery, Oral Pathology and Oral Radiology

Journal homepage: www.joooo.org

Original Research Article

A retrospective study – Pattern of maxillofacial injuries in government dental college and hospital Aurangabad, Marathvada region

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ARTICLE INFO

Article history:
Received 09-01-2023
Accepted 20-01-2023
Available online 10-03-2023

Keywords:
Maxillofacial trauma
Mid -face fractures
Maxillofacial injuries
Patterns of mid -face trauma

ABSTRACT

Government dental college and hospital in Aurangabad, India's state of Maharashtra. Traffic accidents were found to be the most common cause of facial fractures (55.1%), with a male preponderance and a peak incidence between the ages of 20 and 30. The most frequent type of fractures were isolated mid-face fractures (586 patients; 24.05%), followed by isolated mandibular fractures (1257 patients; 51.6%). The zygomatic bone and arch were most frequently involved in midface fractures. The majority of the time, closed reduction and internal fixation were used instead of open reduction and internal fixation. According to the study's findings, traffic accidents are the main reason for maxillofacial fractures. Every citizen is required to enforce and abide by laws that establish preventative measures.

1. Introduction

The oral and maxillofacial surgeon still has a difficulty when it comes to treating fractures of the maxillofacial complex since it requires both skill and knowledge. Trauma is typically categorised in epidemiological studies by anatomical site. Although considering the aetiology and the applied forces that cause the injuries is reasonable for therapy in terms of designing strategies, it is more instructive to do so.[1]

Skin, bone, and the brain all have extremely distinct physical qualities, making the anatomy of the head complex. Additionally, because the bones of the facial skeleton articulate and interdigitate so intricately, it is challenging to break one bone without damaging the neighbouring one.[2]

The severity and pattern of the fracture will be determined by the magnitude of the causative force, the duration of the impact, the acceleration imparted to the body part struck, and the rate of acceleration change. The surface area where the impact occurs is also important.[3]

Disregard for safety while driving, working, or going about daily activities can lead to physical trauma. Furthermore, treatment and rehabilitation are linked to psychological issues, severe morbidities, disabilities, and mental harm. Furthermore, these traumatic experiences place a significant financial burden on individuals and societies.[4] While one injury mechanism may predominate in any given population studied, it is unsure which mechanisms are associated with any given type of mandibular fracture.[5]

The purpose of this article was to investigate the occurrence and cause of facial injuries associated with major trauma, as well as the role of the maxillofacial surgeon in the management of severely injured patients[6] and also the study's purpose was to report on a survey of fractures, frequency of presentation, sex and age distributions, aetiology, site distributions, associated

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https://doi.org/10.18231/j.jooo.2023.006

injuries, and treatment modalities given at government dental college and hospital, Aurangabad treated by the division of oral and maxillofacial surgery between 2019 and 2022 in Maharashtra, India. Such epidemiological data can be used to guide the public health prevention programmes.[7]

2. Materials and Methods

Data from 2,436 patients were analysed retrospectively by age, gender, fracture pattern related to cause, and treatment given over a 4-year period, from 2019 to 2022. Data were obtained from the records of inpatients visited at the trauma centre maxillofacial surgery units in Government dental college and hospital Aurangabad, Maharashtra (Marathvada part), Aurangabad has a population of 37,01,282: (CENSUS 2011) and covers an area of 10,100 km^2. A fracture is diagnosed based on the clinical history, signs and symptoms, visual findings, manual examination, and proper radiograph interpretation. The pattern of facial fracture is determined by fractures of the mandible, midface, and alveolar bone in relationship to various aetiological factors. The LeFort classification was used to classify fractures in the middle third of the facial skeleton. Associated injuries were noted, and treatment options were highlighted. The current study did not include fractures at the base of the skull.

3. Results

The study's data was analysed on a percentage basis. From 2019 to 2022, the annual incidence of facial fractures was studied. There was a male preponderance, with a 7:1 male to female ratio. The most vulnerable age group in both sexes was, predictably, 21-30 years.

3.1. Fracture pattern and cause of injury

The most common type of fracture was isolated mandibular fracture, which was seen in 1257 patients (51.6%), followed by isolated mid face fractures in 586 patients (24.05%). Fractures from traffic accidents occurred in 1843 patients (75.65%). Motorcycles were involved in the majority of traffic accidents (56.8%). The second most common cause of facial fractures (18.6%) was a fall from a great height, followed by an assault (19.6%).

3.2. Mandibular factures and causes of injury

There were 1257 isolated mandibular fractures and 250 associated with midface fractures among 1607 patients with mandibular fractures.

3.3. Face fractures and cause of injury

Among the 829 patients with midface fractures, 586 had isolated midface fractures and 250 had midface fractures associated with mandibular fractures. Automobile accidents were the next most common cause of midface fracture, resulting in isolated fractures in 86 patients and associated with a mandible in 59 patients. A fall from a great height was the third most common cause of midface fracture, with 94 patients suffering isolated fractures, 25 suffering associated mandible fractures, and 22 suffering nasal fractures.

3.4. Sites of facture of middle third facial skeleton

The middle third of the facial skeleton was found to have 829 fractures. In descending order, zygomatic bone and arch accounted for 24%, followed by LeFort II fracture (9.3%), Unilateral LeFort II, Nasal complex fractures, LeFort I&II, Unilateral LeFort I, LeFort I, Blow out fractures. The least common fractures were LeFort III alone and in combination with LeFort I&II. The most common cause of an isolated alveolar fracture in 49 patients was a fall from a great height. Other causes included a motorcycle, an assault, and a bicycle, in that order.

3.5. Associated injury

Lacerations, abrasions, and swelling were the most commonly encountered concomitant injuries in traffic accidents, accounting for approximately 51.2% of all injuries. The next most common injury was associated fractures elsewhere, which accounted for 24.3% of all injuries, with 336 patients suffering from traffic accidents and 174 from other causes.

3.6. Treatment given

Open reduction and internal fixation were used in 36.7% of cases, while closed methods were used in 63.3%. This is consistent with the current trend of closed reduction and internal fixation.

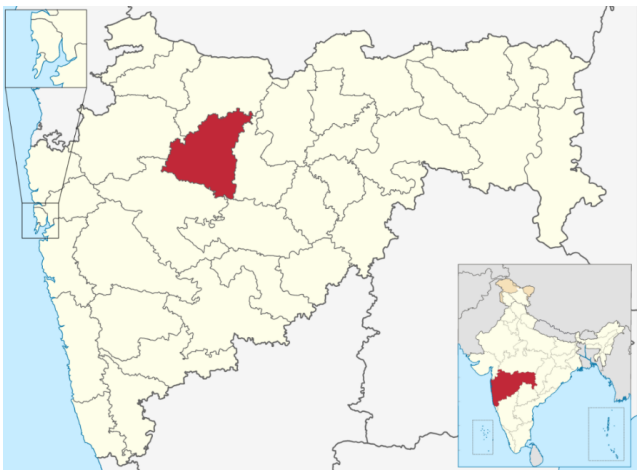

Fig. 1: Location of Aurangabad in Maharashtra

Table 1: Annual incidence of fractures of facial region

Year	Number of cases	Percentage
2019	686	28.16
2020	498	20.44
2021	565	23.19
2022	687	28.20

Table 2: Age and gender distribution

Age group	Male	Female	Others	Total	Percentage
0-10	66	18	-	84	3.5
11-20	346	56	-	402	16.5
21-30	625	311	12	948	38.9
31-40	507	117	2	626	25.7
41-50	129	85	-	214	8.8
>50	95	67	-	162	6.7
Total	1897	525	14	2436	

Table 3: Sites of fractures of the middle third of facial region

Types of fracture	Number of cases	Percentage
Zygomatic bone & arch	332	40.0
Unilateral Lefort I	45	5.4
Unilateral Lefort II	35	4.2
Lefort I	47	5.5
Lefort II	121	14.6
Lefort I & II	39	4.7
Lefort III	71	8.5
lefort I, II & III	41	4.9
Nasal complex	76	9.1
Orbital	22	2.6
Total	829	34.03

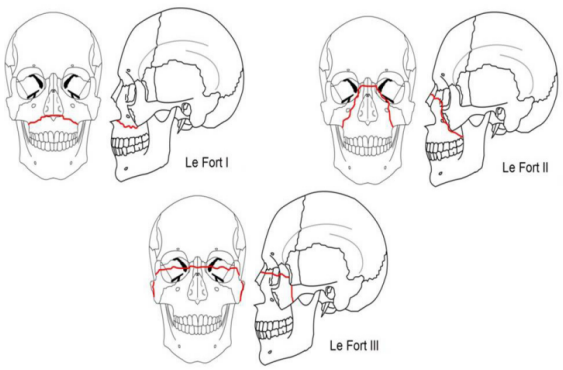

Fig. 2: MId-face fractures

4. Discussion

Geographic region, population density, socioeconomic status, regional government, and time will all influence epidemiologic surveys,[8] and the type of facilities used for the research. The purpose of this study was to assess the epidemiological data of facial skeleton fracture patterns and their relationship to various etiological factors. Data was gathered from patients who visited the government dental college and hospital in Aurangabad, Maharashtra, India.

The finding that men between the ages of 21 and 30 had the highest rate of jaw fracture is consistent with previous reviews.[9–12]

According to the current literature, the incidence of paediatric trauma ranges between 1 and 16% in children under the age of 15, and 0.9-1% in children under the age of 5. Dentoalveolar and soft tissue injuries, rather than facial bone fractures, account for the majority of paediatric maxillofacial injuries.[13] This finding is consistent with our reported cases.

According to this study, the peak incidence of fractures occurred between the ages of 21 and 30. These findings are consistent with other studies that show that young people are more traumatised.[9,10,14–18]

As assumed, there was a male preponderance, with 77.87% of the cases being men and 21.55% being women in a 6:1 ratio. This can be explained by the fact that the majority of such casualties are caused by traffic accidents, falls, assaults, work-related accidents, and violence, in which men are more frequently involved.[9–11,14,17,19,20]

Other reasons for this disparity include social and religious constraints faced by females, particularly in Aurangabad. In this study, women suffered fractures as a result of car accidents, falls, and assaults with decreasing frequency.[10,12,19,21]

Traffic accidents continue to be the leading cause of death in many developing countries, including India. Traffic accidents accounted for approximately 50% of fractures, with violence accounting for 22%.[21,22]

According to the findings of our study, traffic accidents were the most common cause of maxillofacial fractures. Previous research by various authors also revealed that trauma such as motor vehicle accidents, alleged assaults, and falls are the most common causes of maxillofacial fractures.[5,9,10,23]

Our findings contradict the findings of Van beek and Merkx (1999),[24] in which sports and violence were the primary frequent cause of facial fractures.

Road traffic accidents are the leading cause of maxillofacial fractures in Aurangabad. The reasons for this high frequency are difficult to pin down, but they could be due to the factors listed below. Inadequate road safety awareness, unsuitable road conditions due to the lack of expansion of the highway network, speed limit violations, old vehicles lacking safety features such as anti-burst locks and energy absorbing materials, failure to wear seat belts or helmets, entering the opposite traffic lane, violation of the right of way, violation of the highway code, use of alcohol or other intoxicating agents, behavioural disorders, and socioeconomic insufficiencies of some.

Fall injuries have a bimodal age distribution, with the majority occurring in the first decade of life and then again in patients over the age of 50. The majority of facial fractures were caused by falls, particularly among the elderly.[25]

The pattern and severity of facial injury are determined by the victim's terminal velocity and mass, as well as the density, mobility, and area of contact with the object they strike. Fall-related facial injuries were the second most common cause of facial bone fractures in our study, especially affecting the mandible; this finding is consistent with previous research.[6]

Assault caused 90% of fractures in Zimbabwe, and in other studies, it also frequently led to fractures in nations like Jordan (16%) and Canada (41%),[26] Turkey (19.4%), and developing countries like Nigeria (13%) and Brazil (22.5%).[22,27,28] According to our study, assault was the third most common reason for facial injuries. In descending order, the nasal bones, mandible, zygoma, and mid face fractures happen most frequently after the assault.[19] This result contrasts with our findings, which indicated that assault-related injuries resulted in mandibular and maxillary fractures first, then fractures of the nasal bones.

In our study, mandibular fractures were the most prevalent facial fractures; this finding is consistent with earlier studies.[6,9,10,19,28,29] In our study, mid face fractures were the second most frequently observed fracture type after mandibular fractures. This finding was consistent with one from a prior study that was written about.[1,27] This ratio has decreased as the number of midface fractures due to assault, falls, and traffic accidents has increased.[14,15]

These findings are similar to those of Gomes et al. who examined zygomatic fractures and discovered that motor vehicle accidents were the primary cause, with pathological fractures and injuries caused by domestic animals being fewer common causes. Our study also revealed that mid face fracture was frequently sustained in motorcycle accidents, followed by auto accidents and falls from a height. Sports and a few other causes were the least common.

In our study, 63.3% of cases were handled using the closed method, and 36.7% were handled using the open method. This study is comparable to those conducted in the past by Ahmed et al. (2004), Ansari (2004), and Erol et al. (2004). Where closed reduction was applied more frequently. The use of restraints can reduce facial injuries of all severity levels by 25%, reducing the need for medical attention.[28] It has been demonstrated that preventive measures, such as making the use of seat belts and helmets mandatory, improving the enforcement of the "driving while intoxicated" law, warning people about the risks of all-terrain injuries, and providing proper safety guidelines before the purchase of a vehicle, can significantly lower the number of traffic accidents.[29,30]

5. Conclusions

The most frequent cause of facial fractures in this retrospective study of 2436 cases in the government dental college and hospital in Aurangabad between 2019 and 2022 was traffic accidents. A fall from a height was the second most typical reason, followed by an assault. Most fractures happened to people between the ages of 20 and 30. The mandible was the site that was involved most frequently. The most frequent maxillary fractures were zygomatic bone and arch fractures. Equal amounts of open reduction, internal fixation, and closed methods were employed. Programs for raising public awareness should be started. Every citizen should be required to abide by and enforce preventive measures legislation.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Adekeye EO. Pediatric fractures of the facial skeleton: a survey of 85 cases from Kaduna, Nigeria. *J Oral Surg*. 1980;38(5):355–8.

2. Adekeye EO. The pattern of fractures of the facial skeleton in Kaduna, Nigeria: a survey of 1,447 cases. *Oral Surg Oral Med Oral Pathol*. 1980;49:491–5.
3. Ahmed HA, Jaber MA, 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 Endodontol*. 2004;98(2):166–70.
4. Ansari MH. Maxillofacial fractures in Hamedan province, Iran: a retrospective study (1987–2001). *J Cranio-Maxillofac Surg*. 1987;32(1):28–34.
5. Shankar AN, Shankar VN, Hegde N, Prasad R. The pattern of the maxillofacial fractures-a multicentre retrospective study. *J Cranio-Maxillofac Surg*. 2012;40(8):675–9.
6. Banks P, Brown A. Etiology, surgical anatomy and classification. In: Fractures of The Facial Skeleton. Philadelphia, USA: Elsevier; 2001. p. 1–4.
7. Boole JR, Holtel M, Amoroso P, Yore M. 5196 mandible fractures among 4381 active duty army soldiers, 1980 to 1998. *Laryngoscope*. 2001;111(10):1691–6.
8. Czerwinski M, Parker WL, Chehade A, Williams HB. Identification of mandibular fracture epidemiology in Canada: enhancing injury prevention and patient evaluation. *Can J Plast Surg*. 2008;16(1):36–40.
9. Dimitroulis G, Eyre J. A 7-year review of maxillofacial trauma in a central London hospital. *Br Dent J*. 1991;170(8):300–2.
10. Down KE, Boot DA, Gorman DF. Maxillofacial and associated injuries in severely traumatized patients: implications of a regional survey. *Int J Oral Maxillofac Surg*. 1995;24(6):409–12.
11. Erol B, Tanrikulu R, Görgün B. Maxillofacial fractures. Analysis of demographic distribution and treatment in 2901 patients (25-year experience). *J Cranio-Maxillofac Surg*. 2004;32(5):308–13.
12. Gassner R, Tuli T, Hächl O, Moreira R, Ulmer H. Craniomaxillofacial trauma in children: a review of 3,385 cases with 6,060 injuries in 10 years. *J Oral Maxillofac Surg*. 2004;62(4):399–407.
13. Hächl O, Tuli T, Schwabegger A, Gassner R. Maxillofacial trauma due to work-related accidents. *Int J Oral Maxillofac Surg*. 2002;31(1):90–3.
14. Haug RH, Prather J, Indresano AT. An epidemiologic survey of facial fractures and concomitant injuries. *J Oral Maxillofac Surg*. 1990;48(9):926–32.
15. Holmes PJ, Koehler J, McGwin G, Rue LW. Frequency of maxillofacial injuries in all-terrain vehicle collisions. *J Oral Maxillofac Surg*. 2004;62(6):697–701.
16. Huelke DF, Compton CP. Facial injuries in automobile crashes. *J Oral Maxillofac Surg*. 1983;41(4):241–4.
17. Iatrou I, Theologie-Lygidakis N, Tzerbos F. Surgical protocols and outcome for the treatment of maxillofacial fractures in children: 9 years' experience. *J Cranio-Maxillofac Surg*. 2010;38(7):511–6.
18. Iida S, Kogo M, Sugiura T, Mima T, Matsuya T. Retrospective analysis of 1502 patients with facial fractures. *Int J Oral Maxillofac Surg*. 2001;30(4):286–90.
19. Li R, Wang H, Guo L, Tang W, Long J, Liu L, et al. Analysis of maxillofacial fracture victims in the Wenchuan earthquake and Yushu earthquake. *Dent Traumatol*. 2010;26(6):454–8.
20. Moshy J, Mosha HJ, Lema PA. Prevalence of maxillo-mandibular fractures in mainland Tanzania. *East Afr Med J*. 1996;73(3):172–5.
21. Mourouzis C, Koumoura F. Sports-related maxillofacial fractures: a retrospective study of 125 patients. *Int J Oral Maxillofac Surg*. 2005;34(6):635–8.
22. Oji C. Jaw fractures in Enugu, Nigeria, 1985-95. *Br J Oral Maxillofac Surg*. 1999;37(2):106–9.
23. Özkaya Ö, Turgut G, Kayalı MU, Uğurlu K, Kuran İ, Baş L. A retrospective study on the epidemiology and treatment of maxillofacial fractures. *Ulus Travma Acil Cerrahi Derg*. 2009;15(3):262–6.
24. Rowe NL, Williams JLL, Hobbs JA. Etiology of injury. In: Williams JLL, editor. Rowe and Williams maxillofacial injuries. Churchill Livingstone; 1994. p. 34–6.
25. Samieirad S, Tohidi E, Shahidi-Payam A, Hashemipour MA, Abedini A. Retrospective study maxillofacial fractures epidemiology and treatment plans in Southeast of Iran. *Med Oral Patol Oral Cir Bucal*. 2015;20(6):729–36.
26. Schön R, Roveda SI, Carter B. Mandibular fractures in Townsville, Australia: incidence, aetiology and treatment using the 2.0 AO/ASIF miniplate system. *Br J Oral Maxillofac Surg*. 2001;39(2):145–8.
27. Thomas DW, Hill CM. Etiology and changing patterns of maxillofacial trauma. In: Maxillofacial Surgery. London: Churchill Livingstone; 1999.
28. Torgersen S, Tornes K. Maxillofacial fractures in a Norwegian district. *Int J Oral Maxillofac Surg*. 1992;21(6):335–8.
29. Ugboko VI, Odusanya SA, Fagade OO. Maxillofacial fractures in a semi-urban Nigerian teaching hospital: A review of 442 cases. *Int J Oral Maxillofac Surg*. 1998;27(4):286–9.
30. Beek GJV, Merkx CA. Changes in the pattern of fractures of the maxillofacial skeleton. *Int J Oral Maxillofac Surg*. 1999;28(6):424–8.

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Cite this article: Landge JS, Gavali P, Shah KM, Choudhary Y, Lahoti A. A retrospective study – Pattern of maxillofacial injuries in government dental college and hospital Aurangabad, Marathvada region. *J Oral Med, Oral Surg, Oral Pathol, Oral Radiol* 2023;9(1):22-26.