

Characteristics of Maxillofacial Fractures That Entered the ER at Dr. Mohammad Hoesin General Hospital Palembang Period 1 January 2019 - 31 December 2019

Bram Permadi Tanto¹, Abda Arief^{2*}

¹Resident of Surgery, Faculty of Medicine, Universitas Sriwijaya/Dr. Mohammad Hoesin General Hospital, Palembang, Indonesia

²Staff of The Division of Plastic, Reconstructive, and Aesthetic Surgery, Surgical medical staff group/Dr. Mohammad Hoesin General Hospital/Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

*Corresponding Author Email: abdaarief@fk.unsri.ac.id

Abstract

Background: Maxillofacial trauma is a wound or injury that affects the face and jaw.¹ Trauma to the hard tissues of the face can cause maxillofacial fractures, which is damage or breaking of the continuity of the facial bones. Traffic accidents remain the main cause of maxillofacial injury, followed by violence, sports, work-related injuries, and falls^{9,10,11,12} The high number of traffic accidents and violence in Palembang city can increase the risk of maxillofacial fracture. The absence of data regarding the characteristics of patients with maxillofacial fractures at Dr. Mohammad Hoesin General Hospital Palembang became the reason for this research.

Methods: This research is a descriptive observational study with a cross sectional design using secondary data through patient medical records for the period January 2019- December 2019.

Results: There were 89 patients with maxillofacial fractures with complete medical record data. There were more men (83.14%) than women (16.85%). The youngest age of the patient was 7 years, while the oldest age was 70 years, with the mean age of the patient was 29 years. Traffic accidents were the most common cause (79.7%) followed by falls (11.2 %), violence (4.4 %), sports accidents (1.1 %), and other causes (3.3%). 28 fracture locations were recorded on the upper face, 55 with fracture locations at the midface, 26

with fracture locations on the lower face. The zygomaticomaxillaris complex fracture was the most common fractured bone (35.9%). Regarding management, most were managed with ORIF (66.2%) followed by elevated craniotomy (16.85%), conservative (12.35%), soft tissue debridement repair (2.2%) and closed reduction and nasal repositioning (2.2%).

Conclusion: Maxillofacial fracture are found commonly in men. Most patient age ranges. is the age of 21-30 years. The most common cause is traffic accidents. The most frequently affected fracture site is the midface, where the most commonly affected bone is the zygomaticomaxillaris complex. The treatment option most often applied is ORIF.

Keyword: maxillofacial fracture. characteristics of maxillofacial fractures

1. Introduction

Maxillofacial trauma is a wound or injury that affects the face and jaw.¹ Trauma to the hard tissues of the face can cause maxillofacial fractures, which is damage or breaking of the continuity of the facial bones. Maxillofacial fracture is divided into three fracture regions based on anatomy including, lower third fracture of the face, middle third fracture of the face, and fracture of the upper third of the face.²⁻³

The face is very susceptible to injury due to trauma, 20-60% of all traffic accidents cause fractures of the facial bones.^{4,5} Traffic accidents remain the main cause of maxillofacial injury, followed by violence, sports, work-related injuries, and falls^{9,10,11,12} The majority of maxillofacial fractures occur in men between the ages of 21 and 30 years, with a male-to-female ratio ranging from 2: 1 to 11: 1^{9,12,13}. The mandible is the bone most commonly fractured in several studies.²

Data from BPS for South Sumatra Province 2018 shows an increase in the number of motorized vehicles in Palembang by 5.7% between 2016-2018, from 667,786 to 706,025 motor vehicles¹⁵. The increase in the number of motorized vehicles can increase the risk of traffic accidents¹⁶. Data from the Directorate General of Land Transportation show that the rate of land transportation traffic accidents in the city of Palembang is quite high, namely 4,273 cases in 2010 and 3,128 cases in 2014¹⁷.

The high number of traffic accidents and violence in Palembang city can increase the risk of maxillofacial fracture. RSUP Dr. Mohammad Hoesin, as a class A public hospital in Palembang City as a referral center for health services in West Sumatra, is possible to become one of the referral centers for maxillofacial fracture cases. The absence of data regarding the characteristics of patients with maxillofacial fractures at RSUP Dr. Mohammad Hoesin Palembang for the period of January-December 2019 became the reason for this research.

2. Method

This research is a descriptive observational study with a cross sectional design using secondary data through patient medical records for the period January 2019- December 2019. The research sample was maxillofacial fracture patients who entered through the Emergency Room of Mohammad Hoesin Hospital Palembang during January 2019 s.d. December 2019. Exclusion criteria were medical record data of patients with maxillofacial fractures which did not contain one or more of the criteria to be investigated including etiology, sex, age, and anatomical location. This study used a purposive sampling technique. Variables researched were age, gender, etiology, location of fracture, and treatment. The data analysis technique used is descriptive analysis, namely by presenting the data numerically and graphically in the form of a diagram of the prevalence of maxillofacial fractures

3. Results

There were 89 cases of maxillofacial fracture who were treated at the ER RSUP Dr. Mohammad Hoesin Palembang for the period of January 1, 2019 to December 31, 2019 who went to the subdivision of plastic surgery with complete data. The gender distribution of research subjects can be seen in diagram 1. There were 74 men with maxillofacial fractures and 15 women.

From the distribution based on age, there were 0 patients in the age group 0-2 years and 3-5 years, 3 patients in the age group 6-11 years, 34 patients in the age group 12-21 years, 28 patients in the age group 22-39 years, 21 patients in the 40-59 years age group, and 3 patients in the > 60 years age group. The youngest age of the patient was 7 years, while the oldest age was 70 years, with the mean age of the patient was 29 years.

From the distribution based on etiology there were 71 maxillofacial fractures caused by traffic accidents, 4 maxillofacial fractures due to violence, 1 maxillofacial fracture due to sports accidents, 10 maxillofacial fractures due to falls, 3 maxillofacial fractures due to other causes.

Table 1. Distribution of age, gender and etiology of maxillofacial fracture of research subjects

Variables	%	(n)
Age		
0 - 2 year	0	0
3-5 Years	0	0
6-11 years	3.3	3
12-21 years	38.2	34
22-39 years	31.4	28
40-59 Years	23.5	21
> 60 years	3.3	3
Gender		
Male	83.14	74
Female	16.8	15
Etiology		
Violence	4.4	4
Traffic accidents	79.7	71
Sports accidents	1.1	1
Falls	11.2	10
Other causes	3.3	3

Table 2. Distribution of location of fracture, type of bones, and treatment of maxillofacial fracture of research subjects

Variables	%	(n)
Location of fracture		
Upper face	31.4	28
Mid Face	61.7	55
Lower face	29.2	26
Type of bones		
Frontal	31.4	28
Orbita	6.7	6
Nasoorbitoethmoid	1.1	1
Maxilla	31.4	28
Nasal	5.6	5
ZMC	35.9	32
Zygomatic Arch	5.6	5
Mandible	29.2	26
Treatment		
Conservatively	12.3	11
Debridement and repair	2.2	2
ORIF	66.2	59
Closed reduction	2.2	2
Nasal repositioning		
Elevation craniotomy	16.8	15

Regarding the distribution of fracture location, 28 fracture locations were recorded on the upper face, 55 with fracture locations at the midface, 26 with fracture locations on the lower face. The zygomaticomaxillaris complex fracture was the most common fractured bone in this study followed by the maxilla and frontal and mandibular bones.

Regarding the distribution of treatment, 11 people were managed conservatively, 2 people were treated with debridement and soft tissue repair, 59 people were treated with ORIF, 2 people were treated with closed reduction and nasal repositioning, 15 people were treated with elevation craniotomy.

4. Discussion

Our study revealed that there were more men (83.14%) than women (16.85%). The results of this study are in accordance with the research of Sahand et al (2017) which states that the prevalence of maxillofacial fractures is more in men (80.3%) than in women (19.7%).⁴¹ The results of this study are also in accordance with the research of Udeabor et al. Males suffered more maxillofacial fractures with a percentage of 75.6%.⁴² In general, men have a high intensity of driving, often do heavy work, and often do outdoor activities, while women have many restrictions, from social, cultural, and religious rules to the various activities they do^{27,49}

The youngest age of the patient was 7 years, while the oldest age was 70 years, with the mean age of the patient was 29 years. The largest age distribution was age group 12-21 years (38,2%) followed by age group 22-39 years (31.4%) and 40-59 years (23.5%) The results of this study are different from the results of the study by Sahand et al, who reported that maxillofacial fracture patients were mostly found in the age range of 21-30 years.⁴¹ According to Udeabor et al., maxillofacial fractures in Nigeria were mostly found in the 21-30 year age category with a percentage of 50%.⁴² According to research by Chee Wei Lee et al in Sabah, ages 21-30 years have the highest percentage of cases of maxillofacial fractures.⁴³ Similarly, a similar study of maxillofacial fractures at Mohammad Hoesin Hospital Palembang in 2014-2017 by Budiman, H. showed that the age range of 22-39 years is the most common age for midfacial fractures⁵⁰. However, this study is in line with research by Juwita, N, et al. In 2011, the age range of patients who experienced maxillofacial fractures was in the range of 11-20 years (39.26%) at Arifin Achmad Hospital Pekanbaru from the period 2009-2011⁵¹. At the age of 11-21 years, individuals are in puberty and adolescence, so they are vulnerable to being unprepared to face physical and psychological changes, accepting their own condition, so they often show an unpleasant attitude to their environment. In addition, in this age range, individuals generally have unstable emotional development, and have a high level of curiosity, besides that they are just entering their productive period, so they often do strenuous activities

such as exercising, driving, and even getting into fights. This factor increases the risk of physical trauma that can result in maxillofacial fracture⁵².

The largest distribution of etiology of maxillofacial fracture was traffic accident (79.7%) followed by falls (11.2 %), violence (4.4 %), sports accidents (1.1 %), and other causes (3.3%) The results of this study are in accordance with Udeabor's research which shows that traffic accidents are the most common etiology of maxillofacial fractures with a percentage of 45.6% .⁴² This is in line with the results of research by Chee Wei Lee et al which stated that traffic accidents are the main cause of maxillofacial fractures.⁴³ This condition could be caused by the high number of traffic accidents and violence in Palembang. Data from the Directorate General of Land Transportation show that the rate of land transportation traffic accidents in the city of Palembang is quite high, namely 4,273 cases in 2010 and 3,128 cases in 2014¹⁷ The high number of accidents in Palembang may have been influenced by the number of damaged road facilities, the capacity of narrow roads, and the behavior of motorized vehicle drivers who do not obey traffic signs. The number of accidents in Palembang is also influenced by the high number of motorized vehicles in Palembang. Data from BPS for South Sumatra Province 2018 shows an increase in the number of motorized vehicles in Palembang by 5.7%¹⁵. The increase in the number of motorized vehicles can increase the risk of traffic accidents¹⁶.

Our study revealed that the largest distribution of fractured location was on the midface (61.7%). The zygomaticomaxillaris complex fracture (35.9%) was the most common fractured bone in this study followed by the maxilla (31.4 %) and frontal (31.4%) and mandibular bones (29.2%). The results of this study were different with studies by Sahand Samieirad et al.⁴¹, Udeaabor et al.⁴², Chee Wei Lee et al.⁴³, Wasiu Lanre Adeyamo et al.⁴⁴, Prasad B Rajendra et al.⁴⁶, which showed the most frequent fracture location results on the lower face (mandible). The results of this study are consistent with the research of Ammar Al-Hassani et al.⁴⁵, Seval Komut et al.⁴⁷ and Yamamoto et al.³⁹ who showed the most fracture locations in the midface (zygoma). The results of this study are not in accordance with the research of A. Agrawal et al.⁴⁸ which stated that the most fracture locations were in the upperface (frontal). According to the geometry of the face, the most prominent part of the face is the one with the most injuries³². Zygoma and ZMC are bony structures that protrude at the midface and are therefore susceptible to various types of impact fractures if they are subjected to direct trauma³⁹.

Regarding management, most of maxillofacial fracture were managed with ORIF (66.2%) followed by elevated craniotomy (16.85%), conservative (12.35%), soft tissue debridement repair (2.2%) and closed reduction and nasal repositioning (2.2%). The results of this study were different from Udeabor et al, which showed that closed reduction was the most common treatment for maxillofacial fractures.⁴² This result was due to differences in the distribution of variations in the anatomical location of the affected fracture. However, this study is in line with the studies of Yamamoto et al.³⁹, Sahand Samieirad et al.⁴¹, Chee Wei Lee et al.⁴³ who showed ORIF as the most common treatment for maxillofacial fractures. Surgeons prefer ORIF because it offers the advantage of stable and precise reduction of anatomical fragments, allows for immediate recovery of function, as well as increased patient comfort. Indications for ORIF of a zygomatic complex fracture include diplopia, enophthalmus, poor aesthetics, poor aesthetics, and limited mouth opening. This treatment plan will reduce the bone healing period and the recovery period^{41,42,43}.

5. Conclusion

Maxillofacial fracture are found commonly in men (80.3%). Most patient age ranges. is the age of 12-21 years (38.2%). The most common cause is traffic accidents (79.7%). The most frequently affected fracture site is on the midface (61.7%), where the most commonly affected bone is the zygomaticomaxillaris complex (35.9%). The treatment option most often applied is ORIF (66.2%).

6. References

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