

Characteristics of Middle 1/3 Fracture Fractures Assessed with the Facial Injury Severity Scale at the Oral Surgery Policy of Dr Hasan Sadikin Hospital Bandung Period June 2019 - June 2021

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Abstract

Maxillofacial trauma is damage that affects the face and surrounding tissue, where traffic accidents are the main cause of trauma. The location of facial fractures can occur in the upper third, middle third and lower third of the face. The position of the maxilla which is located in the middle third of the face causes it to be protected by the prominent bones of the mandible, zygoma, nasalis and frontalis, so that maxillary fractures are rarely found compared to mandibular fractures. The prevalence of fractures in the middle third of the face is higher than fractures in other areas of the face (upper third and lower third).

Keywords: MISS, FISS

Introduction

Maxillofacial trauma is damage that affects the face and surrounding tissue, where traffic accidents are the main cause of trauma. The location of facial fractures can occur in the upper third, middle third and lower third of the face. The position of the maxilla which is located in the middle third of the face causes it to be protected by the prominent bones of the mandible, zygoma, nasalis and frontalis, so that maxillary fractures are rarely found compared to mandibular fractures. The prevalence of fractures in the middle third of the face is higher than fractures in other areas of the face (upper third and lower third).

The severity of maxillofacial trauma depends largely on the mechanism of injury, the anatomical maxillofacial deformity involved, and the function

of the organ systems associated with the maxillofacial structure. Facial trauma requires a separate assessment system because it can cause multiple functional impairments. Several peer-reviewed journals report the existence of maxillofacial trauma assessment systems such as the Facial Injury Severity Scale (FISS) and Mandible Injury Severity Scale (MISS). The Facial Injury Severity Scale (FISS) is a simple and easy-to-use scoring system for assessing the severity of maxillofacial trauma. This method describes maxillofacial injuries associated with facial anatomical involvement.

This study aims to determine the characteristics of fractures of the middle 1/3 of the face as assessed by the Facial Injury Severity Scale at the Oral

Surgery Clinic, Dr Hasan Sadikin Hospital, Bandung for the period June 2019-June 2021.

Method

This research is a descriptive retrospective study describing patterns that occur in pre-existing patients seen from medical records. The research was conducted at Hasan Sadikin Hospital, Bandung. The time of the research was carried out in June 2019 - June 2021. The research was carried out using the following method: Collecting data on oral surgery patients at Hasan Sadikin Hospital Bandung who were diagnosed with a fracture of the middle 1/3 of the face in June 2019 - June 2021 and could be assessed using FISS, through emergency reports of oral surgery patients at the Oral Surgery Clinic, Hasan Sadikin Hospital, Bandung. Then submit an application for borrowing the patient's medical records which have been recorded in the medical records

department at Hasan Sadikin Hospital in Bandung, then identify the patient's diagnosis of a fracture of the middle 1/3 of the face according to the medical record data. through medical records then a recapitulation is made in Microsoft Excel format and data

processing, data analysis and discussion are carried out

Results

From 50 research samples, the results of the above research showed that the prevalence of fractures of the middle 1/3 of the face in men was 258 patients (86%) and in women there were 42 patients (14%) according to table 1, where the results of the age distribution of patients diagnosed with fractures of the middle 1/3 of the face between the ages of 10-78 years with a mean age and standard deviation of 23 years + 12.7

Table 1: Results of research on the characteristics of patients diagnosed with a fracture of the middle 1/3 of the face in June 2019 – June 2021

Characteristics	N =
Gender	
• Man	258
• Woman	42
Age (min-max) (years)	
10-78	
Age (mean ± SD) (years)	
27 + 12.7	
Etiology	
• Traffic accident	222
• Interpersonal violence	6
• Fall	48
• Sports accident	12
• Work accident	12
• Etc	0
FISS score (range)	
3-15	
FISS Score (Mean ± SD)	
8 + 3.8	

Based on the research results above, the age distribution of patients diagnosed with a fracture of the middle 1/3 of the face is between the ages of 10-78 years with a mean age and standard deviation of 23 years + 12.7 (2).

Based on the etiology that causes trauma to the middle 1/3 of the face, namely caused by work

accidents in 222 patients (74%), caused by interpersonal violence in 6 patients (2%), caused by falls in 48 patients (16%), caused by accidents. 12 patients (4%) had sports, 12 patients (4%) had work accidents, and 0 patients had other causes.

Based on the results of research, patients who were diagnosed with a fracture of the middle 1/3 of the

face and whose severity was measured using the FISS score had a range of degrees between the

ages of 3-15 with a mean score and standard deviation of $8 + 3.8$ (Table 2).

Table 2: Results of research on the severity of patients diagnosed with a fracture of the middle 1/3 of the face

Severity	Frequency	Percentage
Mild (FISS Score 1-3)	48	16%
Medium (FISS Score 4-7)	102	34%
Weight (FISS Score 8-15)	150	50%
Total	300	100%

The results of the research on the degree of severity based on etiology in patients diagnosed with a fracture of the middle 1/3 of the face, namely patients with a mild degree (FISS score 1-3), were 48 patients consisting of 24 cases of traffic accidents, 6 cases of interpersonal violence, and 18 cases of falls. For patients with moderate degrees (FISS score 4-7) there were 102 patients consisting of 66 cases of traffic accidents, 30 cases of falls, and 6 cases of work accidents. For patients with severe degrees (FISS score 8-15) there were 150 patients consisting of 132 traffic accident cases, 12 sports accident cases, and 6 work accident cases.

Discussion

The gender prevalence in cases of fractures of the middle third of the face in this study was found to be more men than women, with the results being 258 patients (86%) in men and 42 patients (14%) in women. The results of this research are in line with research from Lee et. Al stated that the prevalence based on gender was highest in men, amounting to 79% of the total sample studied.¹⁹ This finding is consistent with the fact that men tend to work outside and do a lot of activities using vehicles on the road, while women usually have social limitations^{20,21}. This higher prevalence rate in men is also assumed to be due to extreme behavior in driving, sports and violence. Due to their desire to enjoy the pleasures of life, these subjects have the potential to exceed speed limits, and even engage in physical conflict as a result of their increased physical energy.¹⁸ This is also related to the gender roles of men and women and

also to the social limitations of women in riding motorbikes and other vehicles. Men are more likely to be involved in work outside the home and on the street than women. In a study in Iran it was estimated that only 12.5% of women worked outside their homes.²¹

Based on age characteristics, in this study the age results were between 10-79 years with a mean age of 23 years \pm 12.7. The results of this study are in accordance with previous research which found that the average age at which mid-facial fractures occurred was in the second decade, namely 28 years.¹⁷ In contrast to other studies, the results obtained for cases of fractures of the middle 1/3 of the face mostly occurred at an average age in the fourth and third decades, namely at the age of 48.7 years.¹⁹ and age 34.43 years \pm 11.98 years with a minimum age of 15 years and a maximum of 70 years.²² Maxiofacial trauma often occurs in the age group 21-30 according to Septa et al²³ and Udeabor et al.²⁴ Individuals in the second and third decades of life are the most productive and have a lot of energy to engage in more outdoor activities, leading to a high probability of these activities leading to traumatic maxillofacial fractures.^{18,20} In a study, middle-aged people were the main group in car accidents and a higher proportion of young people had bicycle and motorbike accidents, while pedestrian accidents involved older people. Increasing age is believed to be related to the occurrence of traffic accidents after adjusting for socio-economic factors. Several possible reasons for this have been suggested including greater risk

behavior in young people or greater exposure to high-risk positions.²¹

Based on the etiology of fractures of the middle 1/3 of the face, other journals also say that these three etiologies are also the most common etiologies of fractures of the middle 1/3 of the face, but there is a slight difference in order, in this journal it is said that the most common etiology of fractures of the middle 1/3 of the face is traffic accidents (41%), falls (25%), and violence (16%).¹⁹ A study explains that traffic light accidents are the main cause of trauma in developing countries⁷, while interpersonal violence is the main cause in developed countries.²⁵ Traffic light accidents are related to the lack of enforcement of traffic regulations such as seat belts and helmets for car and motorbike drivers and passengers. Other etiologies of fractures are fall-related, work-related, and sports-related.²⁶ In each study, different cultures, sports, daily activities, and occupations account for variations in the etiology of maxillofacial fractures.²⁰ In a study, of 73 patients, the most common biomechanism of trauma was motorbike accidents at 81.4%. More than half of motorcyclists do not use helmets as head protection (54.4%).²⁷ African authors have also reported that traffic accidents are the main cause of Lefort fractures with proportions of 90%, 73%, and 39% respectively for Moussa *et al.* in Niger, N'Diaye *et al.* in Morocco, Bouguili *et al.* in Tunisia.^{28,29} In Western countries, traffic accidents, falls and assault are the most dominant etiologies. In France, sports accidents are the main cause of facial trauma, with mountain sports leading the way, followed by team sports and combat sports. It is therefore clear that Lefort fractures caused by traffic accidents are more common in developing countries.

In this study, the FISS score was used to evaluate the severity of maxillofacial trauma because this scoring system is simple, the data needed to calculate the FISS score is available in the medical record. This assessment is considered to be able to be used to evaluate the severity of maxillofacial trauma patients. The use of severity scales for

maxillofacial trauma is potentially beneficial, facilitating communication among health professionals about injury severity through standardized classifications. Additionally, it can act as a prognostic and predictive tool to allow physicians to describe the extent of injury to patients, family members, and administrative staff.¹¹ FISS can also be a tool to determine the prognosis of a patient's length of stay through the severity of the patient's maxillofacial injury.

Based on the FISS score, from this study, the results of the degree of severity using the FISS score ranged between 3-15 with a mean score and standard deviation of $8 + 3.8$. The results of this study are almost the same as research conducted by Bagheri, where the results obtained were an average FISS score of 4.4 ± 2.73 and a maximum score of 13.³⁰ This is different from other studies which say the average FISS score obtained was 2.73 ± 1.163 with a score range of 1 to 8.²⁵ The different grading ranges of our study may be because in our study more trauma was caused by high speed, causing more severe facial trauma. Meanwhile, in other studies, most maxillofacial trauma was caused by low speeds. Different FISS scores may also be influenced by injury mechanism, vehicle speed, and traffic volume.²⁷

Based on this research, the distribution of severity as measured using the FISS score was obtained, namely mild degree (FISS score 1-3) in 48 patients (16%), moderate degree (FISS score 4-7) in 102 patients (34%), and moderate degree (FISS score 4-7) in 102 patients (34%), and moderate degree (FISS score 4-7) in 102 patients (34%), weight (FISS score 8-15) as many as 150 patients (50%) with a total sample size of 300 samples. The results of this study differ from those carried out by Shams *et al* where the frequency distribution of mild degrees was found to be the most, with the severity distribution value using FISS the following results were obtained. The severity of the FISS score was classified as Mild (FISS score 1-3) at 54/167 (32, 3%), Moderate (FISS score 4-7) in 80/167 (47.9%), and Severe injury (FISS score 8-15) in 33/167 (19.8%).⁷ The difference in

results from our study may be because in our study more cases were caused by trauma due to high speed, causing more severe facial trauma. Meanwhile, in other studies, most maxillofacial trauma was caused by low speeds.

The results of this study, which assessed the degree of severity based on etiology in patients diagnosed with a fracture of the middle 1/3 of the face, showed that 48 patients had a mild degree (FISS score 1-3), consisting of 24 cases of traffic accidents, 6 cases of interpersonal violence, and 18 cases fell. For patients with moderate degrees (FISS score 4-7) there were 102 patients consisting of 66 cases of traffic accidents, 30 cases of falls, and 6 cases of work accidents. For patients with severe degrees (FISS score 8-15) there were 150 patients consisting of 132 traffic accident cases, 12 sports accident cases, and 6 work accident cases. This is in accordance with research which states that the degree of severity based on the etiology evaluated using the FISS Score is that most are caused by traffic accidents with the highest FISS Score being 11, compared to the FISS score due to other etiologies of interpersonal violence of 8, falling at 10.³¹

In a study, it was shown that the higher the FISS value, the greater the likelihood that the patient would be hospitalized. Patients with a FISS score > 5 were 18 times more likely to be hospitalized for more than 3 days, regardless of need for other specialties. Patients in this study demonstrated higher FISS scores having a strong correlation with the need for intervention in other medical specialties, perhaps due to the fact that the higher the number of facial fractures, the greater the trauma and the greater the risk. possible fractures or injury to other parts of the body.¹¹

Finally, epidemiological studies of facial trauma make it possible to outline the risk situations, as well as the characteristics of individuals susceptible to this type of trauma. Additionally in planning how to manage their patients, evaluating the effectiveness of treatment and understanding complications can provide more realistic and consistent interpretations. It is worth mentioning

that this problem should not only be seen exclusively as a medical condition, but also as a social and economic problem. Health care costs to care for victims, property damage involved in traumatic events, lost wages, and permanent or temporary disability often create difficulties in reintegrating and rehabilitating victims into society and returning to work.

Conclusion

Based on the results of data analysis in this study which was carried out in the oral surgery department of Hasan Sadikin Hospital Bandung with the aim of obtaining an overview of the characteristics of middle 1/3 fractures of the face as assessed by the Facial Injury Severity Scale for the period June 2019-June 2021 which were recorded in the medical record, the results were obtained. as follows. Male gender characteristics are the ones that most often experience fractures in the middle 1/3 of the face, with an average age of 27 years, and the most common cause of fractures in the middle 1/3 of the face is traffic accidents in 74% of cases, a total of 300 samples. , the most common degree of severity experienced by patients with fractures in the middle 1/3 of the face is severe, namely 50% of cases with a FISS score of 8-15. This severity is mostly experienced by male patients (86% of patients) with the most common cause of fractures in the middle 1/3 of the face in male patients being traffic accidents (88% of cases).

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