

Atena  
Editora  
Ano 2022

# ODONTOLOGIA:

Colaborações e trabalhos  
interdisciplinares e inovadores

EMANUELA CARLA DOS SANTOS  
(Organizadora)



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**Revisão:** Os autores  
**Organizadora:** Emanuela Carla dos Santos

### Dados Internacionais de Catalogação na Publicação (CIP)

026 Odontologia: colaborações e trabalhos interdisciplinares e inovadores / Organizadora Emanuela Carla dos Santos. – Ponta Grossa - PR: Atena, 2022.

Formato: PDF  
Requisitos de sistema: Adobe Acrobat Reader  
Modo de acesso: World Wide Web  
Inclui bibliografia  
ISBN 978-65-258-0273-2  
DOI: <https://doi.org/10.22533/at.ed.732222605>

1. Odontologia. 2. Saúde bucal. I. Santos, Emanuela Carla dos (Organizadora). II. Título.

CDD 617.6

Elaborado por Bibliotecária Janaina Ramos – CRB-8/9166

**Atena Editora**  
Ponta Grossa – Paraná – Brasil  
Telefone: +55 (42) 3323-5493  
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## APRESENTAÇÃO

Por muito tempo a ciência caminhou em direção à fragmentação, sendo a especialização entendida como a melhor forma de conhecimento. Sem sombra de dúvida, o profundo saber sobre determinada área é de extrema importância, porém o entendimento do todo não pode ser deixado de lado.

A colaboração de diferentes áreas traz enriquecimento e melhorias, pois observa o problema por diferentes ângulos e busca soluções a partir de pontos de vista incomuns. A interdisciplinaridade e inovação são pontos-chaves na formação e evolução dos profissionais e das profissões.

Este e-book da Atena Editora conta com a colaboração de cientistas de diferentes especialidades, que trazem seus trabalhos para serem compartilhados com a comunidade científica e acadêmica, mostrando o que há de novo através das pesquisas mais recentes.

Ótima leitura!

Emanuela Carla dos Santos



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## AN EPIDEMIOLOGICAL STUDY ON THE PATTERN AND PREVALENCE OF MANDIBULAR FRACTURE IN HADRAMOUT GOVERNMENT

*Data de aceite: 02/05/2022*

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**ABSTRACT: Objective:** The aim of this study was to determine the etiology, frequency of mandibular fractures among different age and sex, to determine the frequency of types of trauma, and to report the different modalities of treatment provided to among patients of AL-wadi Hospital (2004-2017). **Methods:** A retrospective analysis of the registration files of various mandibular fracture patients was conducted on cases diagnosed during (2004-2017) in patients of AL-wadi hospital in Hadramout which were treated by maxillofacial surgeon dr, Mohammed M Baraja. **Results:** Out of 43 patients, Forty were males (93%) and three were females (7. %). We found a peak occurrence in young adults, aged 21-40 years (35%). In case of etiology of fracture, road traffic accidents (RTAs) was the most common (58%). In most (60,5) of the patients, an open reduction and rigid internal fixation using bone plate and screws with intramaxillary fixation

were done. **Conclusion:** In the present study, the prevalence of mandible fractures was more prevalent in male patients, especially during the 2<sup>ed</sup> and 3<sup>rd</sup> decade of life. The most common cause was road traffic accident . Open reduction and rigid internal fixation using miniplates and screws with intramaxillary fixation was the most commonly used treatment.

**KEYWORDS:** MF=Mandibular fracture; CRIF=close reduction, ORIF=Open reduction with internal fixation by miniplates and screws .

### **OBJECTIVES**

To assess the prevalence of mandibular fractures and it's relationships to age, sex, trauma types and treatment options among patients of AL-wadi Hospital (2004-2017).

### **INTRODUCTION**

Injuries of the maxillofacial complex represent one of the most important health problems worldwide.[1] Maxillofacial injuries, such as soft-tissue injuries, dental injuries, or maxillary, mandibular, and zygomatic fractures; are the most common injuries treated by oral and maxillofacial surgeons.[2]. The mandible is a unique bone having a complex role in esthetics of the face and functional occlusion. Because of the prominent position of the lower jaw, mandibular fractures are the most common fractures of the facial skeleton. It has been reported that fractures of the mandible account

for 36% to 59% of all maxillofacial fractures.[3] Despite the fact that it is the largest and strongest facial bone, it is the tenth the most often injured bone in the body[4] and second to nasal bone fractures[5] and it is fractured two or three times more often than other facial bones.[6]

The causes of maxillofacial fracture have changed continuously over the past three decades, and they continue to do so. The main causes of this fracture type worldwide are traffic accidents, assaults, falls, and sport-related injuries. Many studies have examined the incidence and causes of maxillofacial injury .[7]

The epidemiology of facial fractures varies among populations with respect to type, severity, and cause [8]. An understanding of maxillofacial trauma aids the assessment of behavioral patterns in people in different countries and helps to establish effective measures for injury prevention and treatment[9].

Mandibular fractures have been studied extensively, and some controversy remains regarding the ideal treatment approach. The advent of AO/ASIF (Arbeitsgemeinschaft für Osteosynthesefragen/Association for the study of internal fixation) and microplating systems has further increased debate as to whether open reduction is a better treatment option for mandibular fracture treatment compared with closed reduction[10]

## METHODOLOGY

- **Study design and setting:**

The study was retrospective descriptive study, relied on data that have been collected through medical records. The study was carried out at Al-wadi hospital.

Sayun is located on Hadramout coast of the arabia sea, which stretches on 450 Kilometers in the south of Yemen. The total population of wadi – Hadramout district in at 2013 is about 614670 person.

- **Study population and data collection:**

In this study, we included all patients with respected mandibular fractures entered in al-wadi hospital , during the study period from 1st January 2004 to 31st December 2017.

- **Statistical methods:**

The data was checked for completeness, coded then was entered into computer by statistical package for social (SPSS).

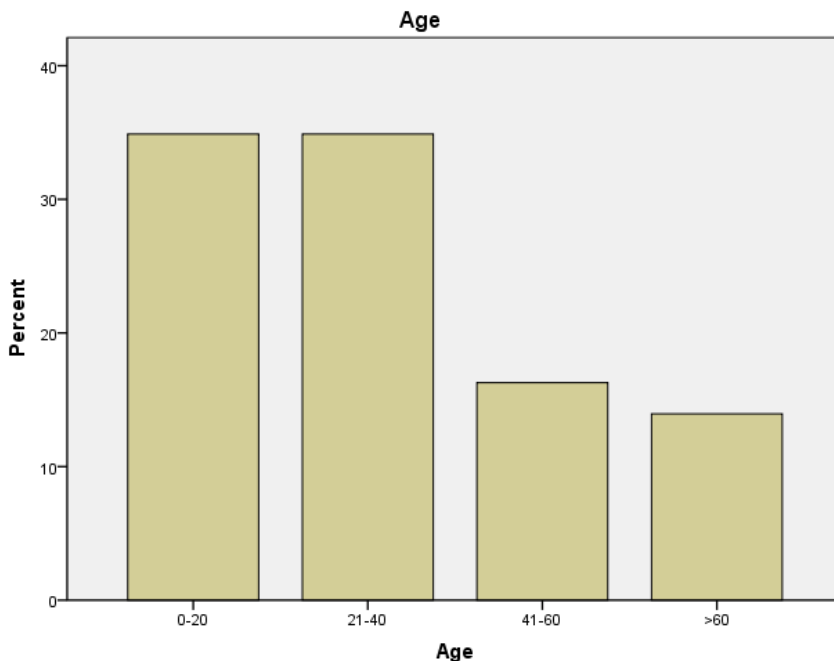
Obtained data was analyzed by using descriptive statistical tables (frequencies, percentages). Data was presented in tables and graphs by using computer applications (Excel & Word).

- **Ethical considerations:**

We ensure that the information involved in the study and used for the benefits of the

community.

## RESULTS



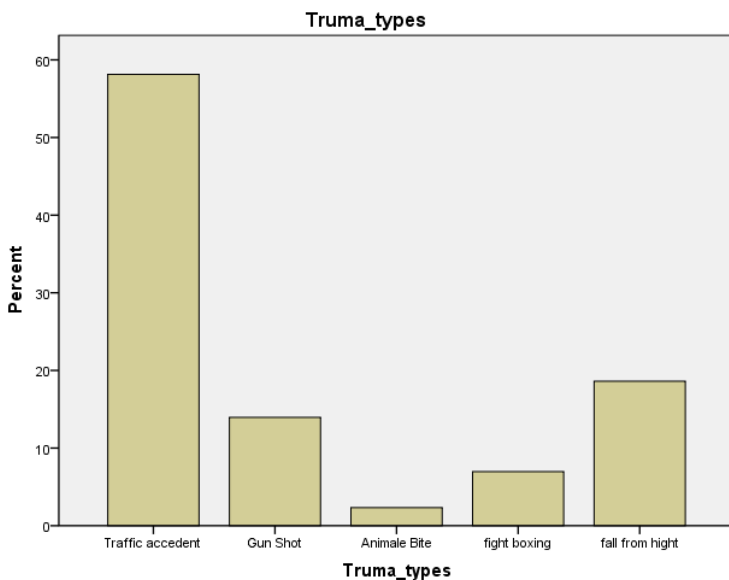
The graph (1) : age distribution of patient show the majority of patient on age 0-20 and 21-40.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	40	93.0	93.0	93.0
	Female	3	7.0	7.0	100.0
	Total	43	100.0	100.0	

Table (2): sex distribution of patient , majority of patients was male .

Trauma_types	Age				Total
	0-20	21-40	41-60	>60	
Traffic accident	8	8	3	6	25
Gun Shot	0	4	2	0	6
Animale Bite	1	0	0	0	1
fight boxing	2	1	0	0	3
fall from hight	4	2	2	0	8
Total	15	15	7	6	43

Table ( 3): Etiologic distribution of mandibular fractures in ages. The most etiologic type as traffic accident occurred on age 0-20 and 21-40 , and less occurred on age more than 60 years old.

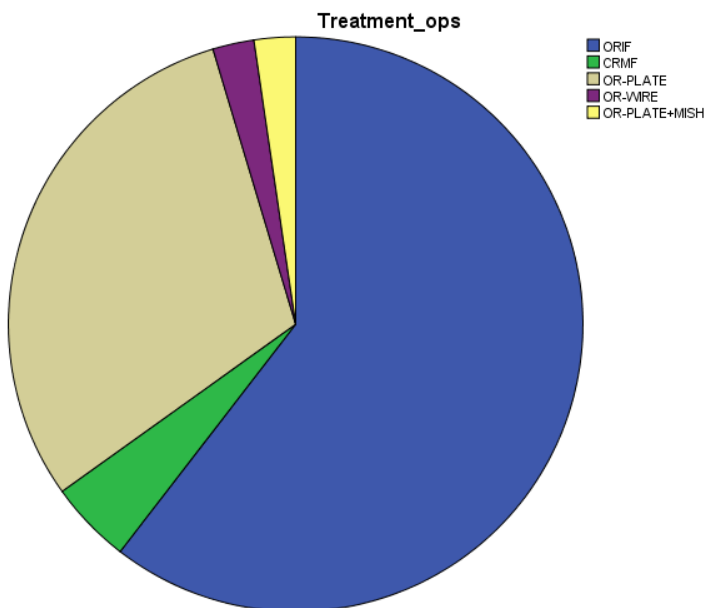


(graph 4) : trauma types distribution of patient, this table showed the most common type of trauma type was traffic accident and the less common one was animal bite.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ORIF	26	60.5	60.5	60.5
	CRMF	2	4.7	4.7	65.1
	OR-PLATE	13	30.2	30.2	95.3
	OR-WIRE	1	2.3	2.3	97.7
	OR-PLATE+MISH	1	2.3	2.3	100.0
	Total	43	100.0	100.0	

(5)





(6)

Table and graph (5+6) : treatment options distribution of patient , this showed the most common type of treatment option was ORIF and less common were fixation with wire and fixation with plate and mish.

		Treatment_ops					Total
		ORIF	CRMF	OR-PLATE	OR-WIRE	OR-PLATE+MISH	
Age	0-20	7	2	6	0	0	15
	21-40	11	0	2	1	1	15
	41-60	3	0	4	0	0	7
	>60	5	0	1	0	0	6
Total		26	2	13	1	1	43

Table (7): treatment options distribution of mandibular fractures in ages, this showed the most common treatment options (the ORIF) which was related to age group 21-40. Also the less common treatment options ( with wire and with plate +MISH) related to age group 21-40.

		Treatment_ops			
		ORIF	CRMF	OR-PLATE	OR-WIRE
Trauma_types	Traffic accident	14	2	8	1
	Gun Shot	4	0	1	0
	Animale Bite	0	0	1	0
	fight boxing	3	0	0	0
	fall from hight	5	0	3	0
	Total	26	2	13	1

		Treatment_ops	
		OR-PLATE+MISH	Total
Trauma_types	Traffic accident	0	25
	Gun Shot	1	6
	Animale Bite	0	1
	fight boxing	0	3
	fall from hight	0	8
	Total	1	43

Table 8 : treatment options distribution of mandibular fractures in trauma types showed the commonest type of trauma (traffic accident) was treated commonly by ORIF . but the less common type ( animal bite) was treated with plate.

## DISCCUSION

In the recent study, the result of (graph-1) showed that the majority of the patients of MF were 34.9% of sample on both group age 0-20 years and 21-40 years . also (graph1) showed that 16.3% of sample were on age 41-61 years old, 14% were more than 61 years old . Also The results of this study (Table-2) showed that the males (93 % ) were at higher risk of MF than the females (7%) , this result agree with KSA study which performed in Riyadh stated that males were more affected with MF than females. [9] . In Riyadh , a MF is three times more common in men than women [9] .

In the resent study as in table 3 showed traffic accident (58.1% of the whole sample),were the main etiological factor in maxillofacial injury in those of age(0-20) and (21-40) years old, This finding is in agreement with those of many studies [12], also the fight ( boxing or assault) more in age less than 20 years as 25 cases from 43 , In contrast to our study results, other studies have reported that assault was the main etiological factor in maxillofacial injury [12+13]

The causes of fracture have extremely variable incidence depending on social, geographical, and economic characteristics[14] ,Table (4) shows the distribution of patients with MF based on its trauma types . 59% of sample shows accident traffic In the present study, RTAs was the most frequent cause of fracture, this might be because a large proportion of the population uses a motorcycle on a daily basis.[4] The increasing number of RTAs in developing countries like Yemen exactly(Hadramout) may be attributed to many factors like sharing of roadways by pedestrians and animals with fast-moving vehicles, with almost no segregation of pedestrians from wheeled traffic; the large numbers of old and poorly maintained vehicles on road; large numbers of motorcycles; low driving standards; large numbers of overloaded buses; widespread disregard for traffic rules; defective roads; poor street lighting; and defective layout of cross roads and speed breakers. In addition, the increasing volume of traffic as a result of economic expansion and rapid increase in the density of urban population may also be the factors responsible for increasing RTAs in

recent times.[15]

Treatment of mandibular fractures has changed over the last 20 years.[3] In 1989, Arthur and Berardo introduced a simplified technique of maxillomandibular fixation (MMF) by the use of cortical bone screws and stainless steel wire. This technique offers several advantages over traditional closed reduction techniques; including ease of technique, reduced operative time, and diminished chance of glove penetration and transmission of human immunodeficiency virus (HIV) and hepatitis B virus.[16]

There has been a decrease in the use of wire osteosynthesis and intermaxillary fixation and an increase in preference for open reduction and internal fixation with bone plates and screws. This has helped to reduce malocclusion, nonunion, improved mouth opening, speech and oral hygiene, decreased weight loss, and increased the ability for patients to return to work earlier.[3]

There are many different therapeutic possibilities, but many authors disagree about the best treatment approach.[3]

The treatment of mandible fractures requires adequate fracture reduction and stabilization through a closed or open technique. Success relies on the restoration of normal dental occlusion and bony union.[16] The treatment chosen may differ as there are many factors like cost of treatment, affordability by the patient, feasibility in the hospital, doctor's decision and skill, and patient's willingness to avail the treatment advised; all of which may vary from one country to another.[15]

In the present study as on tables (5.6.7.8), 2 patients (4.7%) were submitted to closed reduction, all of them due to traffic accident and with age group between (0-20 years), 13 patients(30,2%) was treated with open reduction and rigid internal fixation using bone plates followed by physiotherapy,(8 of them due to traffic accident, 3 due to fall from high and 1 due to animal bite also last 1 due to gunshot),the most of them on age group (0-20 years old).

1 patient (2.3%) was treated with open reduction and rigid internal fixation (ORIF) using bone plates and mish, which is due to gunshot and on age group (21-40) years old.

also 1 patient (2.3%) was treated with open reduction and rigid internal fixation using wire, which was due to traffic accident and age group (21-40 years old).

this is in agreement with other literature studies.[6,17,18] And remaining 26 patients (60,5%) were treated with open reduction and rigid internal fixation using miniplates and screws with intramaxillary fixation which were majority patients of them due to traffic accident and on age group (21-40 years old).

Closed reduction and MMF treatment was preferred in cases of single, simple, or bilateral fractures; with little deviation or when the number of teeth and dental support provide conditions for the stability of the occlusion. ORIF was advised in patients with partial dentition, multiple, displaced, or severely comminuted fractures. Subcondylar fractures were mostly treated by CR and MMF or ORIF followed by physiotherapy to avoid TMJ stiffness

whereas high condylar fractures were treated by soft diet and physiotherapy.

Epidemiological reviews of these injuries are needed to identify the risk factors leading to such trauma and help to train medical and dental practitioners to diagnose facial trauma and to provide immediate and long-term treatment.[19] These reviews are useful for reaffirming previously established trends and identifying new patterns of disease frequency. Additionally, the success of treatment and the implementation of preventive measures are more dependent on the epidemiological assessments.[20]

Mandibular fractures occur in people of all ages and races, in a wide range of social settings.[21] It is hoped that such assessments as the one presented here will be valuable to government agencies and healthcare professionals involved in planning future programs of prevention and quantifying demands or services[3] and treatment.[21].

## CONCLUSION

In the present study, the incidence of mandible fractures was more prevalent in male patients, especially during 2<sup>nd</sup> the 3<sup>rd</sup> decade of life. The most common cause was traffic accident and. Open reduction and rigid internal fixation using miniplates and screws was the most commonly used treatment.

The coordinated and sequential collection of information concerning demographic patterns of maxillofacial injuries may assist healthcare providers to record detailed and regular data of facial trauma. An understanding of the cause, severity, will permit the clinical and research priorities to be established for effective treatment and prevention of those injuries.

Since, the main cause of these fractures proved to be traffic accident, any efforts made to enforce traffic and safety rules in the roads and improve traffic culture can be an effective measure to promote the present situation. In addition, the need to encourage massive investments in safer alternative transport system needs to be emphasized.

Since, significant association was found between cause of fracture and options of treatment involved in the present study, more studies are needed to confirm these associations which will help the attending healthcare professional in making quicker and correct diagnosis and management in all head and neck trauma patients.

## RECOMMENDATIONS

For persons:

- 1- Reducing the excessive speed in driving vehicles that move from the movement of vehicles.
- 2- No negligence, whether by vehicle drivers or pedestrians, such as the car drivers' preoccupation with setting the radio or adjusting the cooling device, or the preoccupation of pedestrians and vehicle drivers with their phones

3- Not to cross traffic laws, such as cutting a traffic light, driving at a speed that is not allowed, or crossing the street without turning right and left, and this transgression may be intentional, or due to lack of awareness of traffic laws

4- The vehicle is not free from safety conditions, such as seat belts and good brakes.

For community:

1- Spreading awareness among the general public about traffic laws

2- Teaching motorists the rules of the road well, in both theoretical and practical ways

3- While driving at night, the car lights must be turned on and the lighting must be dim

4- At night, pedestrians must wear light clothing so that motorists can see them

5- Treat the infrastructure so that the roads are two-way, allocate a bike lane and also take care to close the potholes

For emergency Doctor:

1- Must be to know how to deal with patients in emergency and how to help them

2- Speed and proper behavior in treating the injured

3- See everything new, increase knowledge and develop skills

For maxillofacial surgeon :

1- Must be to know how to deal with patients in emergency and how to help them

2- Carry out urgent and necessary operations for injured people from accidents

3- See everything new, increase knowledge and develop skills

For hospital :

1- The ability to receive the injured and the speed of treatment

2- Equipping hospitals with all the necessary equipment and equipment to treat the injured

3- The presence of qualified and specialized doctors and their continuous rehabilitation

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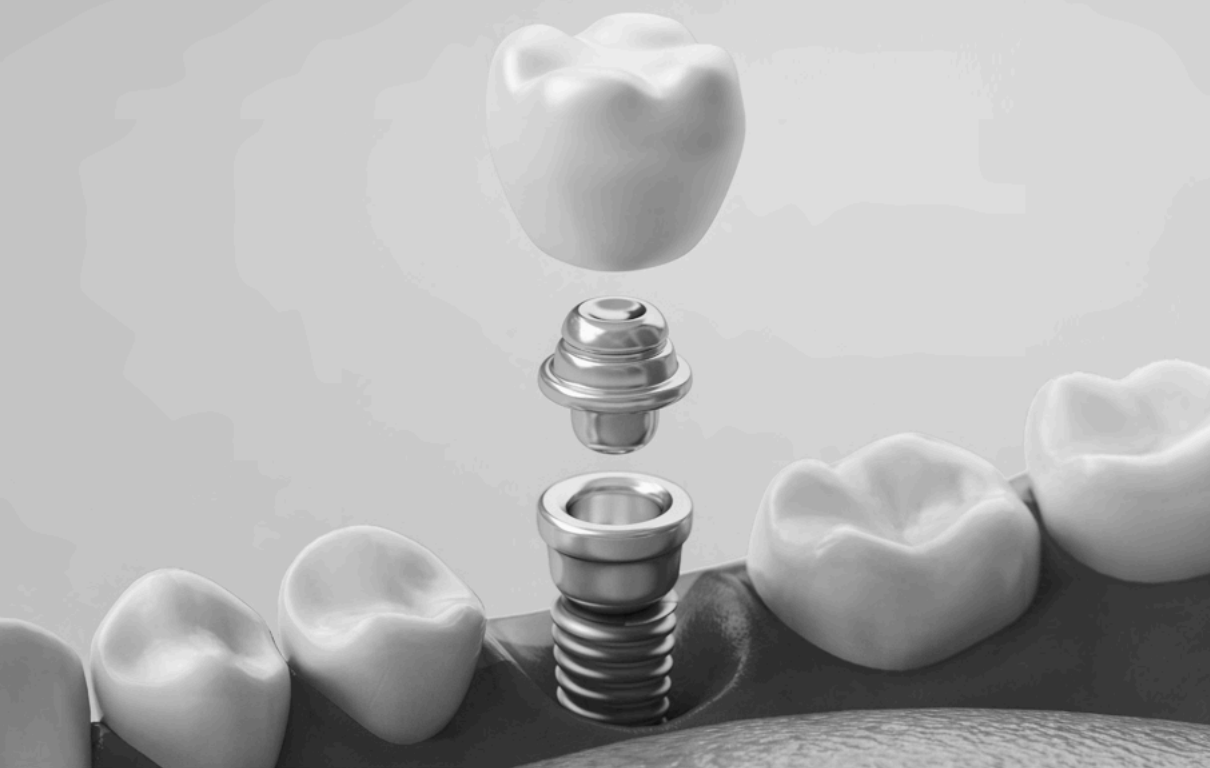
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