Epidemiological study of Mandibular Fractures Aetiology and Site Using computed tomography in AL Kut city

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دراسة ميدانية لكسر الفك السفلي اسباب الكسر والموقع التشريحي للكسر باستخدام الاشعة في مدينة الكوت

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المستخلص

الفك السفلي يمثل الجزء الاكبر والمتحرك من بين عظام الوجه يبدء بشكل عظمين منفصلة يلتحمان في السنة الاولى من عمر الطفل وكونه هو العظم البارز من عظام الوجه فهو االاكثر عرضة للكسر.الغرض من البحث هولدراسة مسببات الكسر والموقع التشريحي للكسر وتضمنت الدراسة 115 شخص قد تعرض للكسر وحول الى قسم جراحة الوجه والفكين في مدينة الكوت بعد ان اجري له الفحص الطبي والفحص بالاشعة.الدراسة تضمنت تقييم وتسجيل الجنس ,العمر اسباب وموقع الكسر.ومن نتائج كان فئة العمر بين21الى30سنة هي فئة العمر الاكثر بنسبة 26.08%و17.39%هم عمرهم اقل من10 سنوات بينما كانت نسبة الاشخاص الاكبرعمرا من60 سنة .نسبة الرجال الى النساء كانت 1:4 وكانت الحوادث المرورية هي الاكثر سببا لحدوث الكسر بنسبة 52.1% تتبع بالسبب الاخر وهو السقوط اما الحوادث الصناعية هو الاقل تسببا لكسر الفك السفلي بنسبة 1.7% وكان مجموع الكسور هو 146 كسر من 115 شخص تعرض للكسر يعني انه يوجد اكثر من كسر لنفس الشخص وكان المجاور لمنتصف الفك السفلي هو المكان الاكثر عرضة للكسربنسبة 30.43% (في كل العالم يعتبر كسر الفك السفلي في موقع الجدل بالنسبة للباحثين نظرا لاهميته الوضيفية .نسبة الرجال اعلى من النساء نظرا لفعاليات الرجال اكثر من النساء المتضمنة في سياقة الشاحنات والنشاطات الاجتماعية).

Abstruct:

The mandible is the largest and only moveable facial bone. It begins as 2 separate bones and unites anteriorly when a child approaches 1 year of age. Being a prominent bone of the facial skeleton, it is fractured most commonly among maxillofacial injuries.

This epidemiological study was conducted to evaluate the etiology of mandibular fractures and anatomical site of the fracture in 115 patients treated in the Department of Oral and Maxillofacial department ALZhraa hospital in ALKut city from 2012 to 2014. These patients were examined both clinically and radio-graphically for mandibular fractures. Records related to age, sex, and etiologies of fracture and sites of fracture were evaluated and reviewed. The most common age group affected was

21-30 years (26,08%). Only 17.39% of patients were less than 10 years of age, and 1.7% was more than 60 years of age. Male to female ratio was 4:1. The most common cause of mandibular fractures was road traffic accidents (52.1%) followed by accidental fall (26.08%), while the least involved group was industrial accidents (1.7%), A total of 146 fractures were sustained by 115 patients at different sites there were multipl fractures in the same person .The most common site of mandibular fracture was parasymphysis (30.43%). All over the world, mandibular fractures have continued to generate discussion among researcher due to their important fuction .The male to female ratio shows 4:1 this is also in agreement with most of the studies due to their freqent participation in high risk activity such as driving vehicles sport that involve physical and active social life .

Keywords: Mandibular fractures, Etiology, Road traffic accidents (RTA), Accidental fall

Introduction

Mandible is the only mobile bone of the facial skeleton which plays an important role in mastication, speech, and deglutition. Being a prominent bone of the facial skeleton, it is fractured most commonly amongmaxillofacial injuries.[1] Its fracture causes severe loss of function and disfigurement.[1]

The mandible with its U-shaped bony structure forms the skeleton of the lower facial height. It is a relatively well exposed and prominent portion of the facial skeleton. As a result, mandibular fractures form between 36% to 54% of all facial bone fractures.[2]The mandible is divided into eight regions. The symphysis is located in the midline, joining the right and left halves of the mandible. The parasymphyseal region is located on either side of the symphysis, and spans from canine to canine. Moving posterolaterally, the body is the region from the canine to the angle, which is the non-tooth bearing region between the body and the ramus. The ramus is the vertical portion of the mandible that extends from the angle toward the terminating at the zygomatic arch coronoid process and condyle. The condyle articulates with the glenoid fossa providing the pivot point for motion of the mandible. The mandibular notch is located between the condyle and the coronoid process Mandible is the only mobile bone of [34] the facial skeleton which plays an important role in mastication,speech, and deglutition. Being a prominent bone of the facial skeleton, it is fractured most commonly among maxillofacial injuries.[5] Its fracture causes severe loss of function and disfigurement The key to success for the treatment of fractured mandible is proper diagnosis to detect the site, direction and degree of displacement of each fracture line. However, proper diagnosis depends on detailed history,

clinical examination, followed by good and clear radiographic views [6]Mandible occupies very prominent and vulnerable position on the face and is a much favored target inintentional and unintentional impact [.7] it is the tenth most often injured bone of the body and the second most in the face [7,8]

Aetiology varies from country to country and they can usually be attributed to cultural, social, environmental and economical factors. The relationship between alcohol consumption and maxillofacial injuries is well known.[9] Studies around the world have shown that assaults are the predominant cause of maxillofacial fractures in developed countries, while motor vehicle accidents (MVA) are the most common cause in developing countries. [10]

studies regarding maxillofacial fractures are helpful in evaluating the quality of patient care and in planning preventive strategies. These studies are also valuable in identifying new frequencies and patterns of these fractures.[11]

Current established methods in the management of mandibular fractures include conservative treatment with maxillomandibular fixation (MMF) by surgical dental wiring, arch bars and Gunning splints, open reduction and intraosseous wiring, open reduction with rigid internal fixationby miniplates, non-compression plates, compression plates and lag screws[12] The purpose of this study is to evaluate various epidemiological features of mandibular fractures, as the etiology of mandibular fractures is a direct reflection of the social status of the society and the level of education of the public. This study also highlights themeasures to be taken in the prevention of mandibular fractures.

Material and method

This descriptive study had been carried out on 115 consecutive patients of any sex and age group presenting with the features of mandibular fractures at oral and maxillofacial department in ALZhraa hospital from 2012 to 2014 in al kut city . Data regarding age, sex, causes and anatomic sites of fractures and treatment modalities were collected. The computed radiographs of the mandible were obtained in all patienst Computed Radiography (CR) **figure 1** is the generic term applied to an imaging system comprised of: Photostimulable Storage Phosphor to acquire the x-ray projection image CR Reader to extract the electronic latent image and Digital electronics to convert the signals to digital form. The radiograph projections included anteroposterior projection as in the **figure 2** ,lateral and Towne and Waters in patients suspected of having subcondylar fractures or associated facial fractures. Radiographs were scanned using a high-resolution scanner, and fracture lines were marked.

Age was classified into groups according to the age of patient . The causes of the accidents were grouped into the following categories: road traffic accidents (RTA),sports, falls, bullet and other causes based on the documented radiographic findings, the fracture sites were assigned to one of six anatomical subsites including

symphysis/parasymphysis, body, angle, ramus, condyle and coronoid process.

figure 1:Computed Radiography (CR)

Figure 2: radiograph with posterior anterior projection showing parasymphysal fracture of the mandibl

Results:

The study was conducted on 115 patients. The most common age group affected was 21-30 years (26,08%) and the mean age of 26.8 years.

Only 17.39% of patients were less than 10 years of age, and 1.7% was more than 60 years of age (Table - I). Male to female ratio was 4:1. The most common cause of mandibular fractures was RTA (52.1%) followed by accidental fall (26.08%), while the least involved group was industrial accidents (1.7%), (Table - II). A total of 146 fractures were sustained by 115 patients at different sites (Table – III). The most common site of mandibular fracture was parasymphysis (30.43%), followed by body and condylar area of the mandible (26.08%), followed by angle of mandible and the least involved site was coronoid (1.73%).

Table I:Showing Reiationship between Age Groups and Number of Patients

Age groups in year	Number of patients	Percentage
1-10	20	**17.39**
11-20	30	**26.08**
12-30	35	**30.43**
31-40	15	**13.04**
41-50	10	**8.69**
51-60	3	**2.60**
Above 60	2	**1.73**
Total	115	**100%**

Table II:Showing Relationship between Eitiology of Fracture and Number of Patients

Eitiology of fractures	Number of patient	Percentage
RTA	60	**52.1**
FALL	30	**26.08**
Bullet	5	**4.3**
ASSULT	10	**8.6**
SPORT	5	**4.3**
Industerial	2	**1.7**
Other cause	3	**2.6**
Total	115	**100**

Table III:Showing Relatioship between Fracture Site and Number of Patients

Fracture site	Number of patient	Percentage
Symphysis	20	**17.39**
Parasymphysis	35	**30.43**
Body	30	**26.08**
Angle	27	**23.47**
Ramus	1	**0.86**
Codyle	30	**26.08**
Coronoide	2	**1.7**
Total	146	**100**

Discussion:

The mandible is the largest and only moveable facial bone. In the United States, the mandible is the third most fractured bone of the face. [13] This study was retrospectively evaluated; of the 115
patients seen, there were 146 confirmed mandibular fractures, thus emphasizing the likelihood of multiple mandibular fractures occurring in the same patient. In this study, the age group of 21 – 30 years predominated the incidence of mandibular fractures[14,15]may be due to their involvement more in travelling to work place and outdoor activities. The other cause of increased incidence of accidents in this age group may be their risk taking behavior along with lack of knowledge or in most of the cases, violation of traffic rules. The other possible cause for incidence of fracture may be the more activity in sports, fights, violent activities, industry and high speed transportation and thus people in this age group are more vulnerable to trauma. The low frequencies of very young and old age groups are due to the low activities of these age groups in violent activities and high speed transportation .Male were affected in 80. % of total cases and females in 20%.the male to female ratio shows 4:1 this is also in agreement with most of the studies [16.]

Many authors have reported motor vehicle accidents as a major cause of mandibular fractures[17,18] Stylogianni L et al [19] reported that road traffic accident (RTA) followed by fall as the leading cause of mandibular fractures in developing countries. whereas others have recorded physical assault as dominant cause.[20] Road traffic accidents were the most frequent cause of jaw fracture in this study (52.1%) this may be due to over speeding, negligence of traffic rules and bad road conditions [21]followed by fall from height(26.08%).

In this study the most common site of mandibular fracture was the parasymphysis (30.43%) followed by the body angle and codyle .Parasymphysis fracture pre-dominates other sites of the mandible and may be due to the fact that mandible is a very prominent bone and majority of these fractures are caused by road traffic accidents. Similar results were given by study by Abbas I et al[18] where parasymphysis was accounts for 29.40% and as well as study done by Renton TF et al [22]and Moreno JC et al [23] where parasymphysis predominated other sites of mandible.

Conclusion: Road traffic accidents (RTA) represented the major etiological factor of mandibular

fracture, with young adult males as their main victims.

This study can guide us to evaluate various etiological features of mandibular fractures, as it help to study the modes of accident, pattern of injury, causes of RTA and possible preventive measures that can be undertaken in this area .

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