

Effect of age on the site of mandibular fracture

Mandibular kırık yeri üzerine yaşın etkisi

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Abstract

The mandible is the largest and strongest bone of the face, and it is basically a tubular long bone which is bent into a blunt V-shape. The aim of the study was to study effect of age on the site of mandibular fracture. The study included 100 patients (80 were males and the rest were females) with mandibular injuries admitted to Maxillofacial Unit, Specialized Hospital for Surgery in Baghdad from April 1996 to December 1996. The majority of those patients were of civilian type of injury, and a few of them were of bullet injury. The highest number of patients' age was between 20 to 29 years, males constitute higher numbers than females. The common etiology for mandibular fractures were fight (35%), and fall from height (31%). The common site of single fracture was angle (42.31%), and in the multiple fractures were condyles and parasymphysis (27.27%). Mandibular fracture is more common in younger age group (20-29 years) and then 30-39 years. This study showed that fight and falls are most common cause of mandibular fracture in younger men affecting angle and condylar region.

Keywords: Age; fracture; mandible

Özet

Mandibula yüzün en geniş ve en kuvvetli kemiğidir ve temelde kün V-şekline bükülmüş tübüler uzun bir kemiktir. Çalışmanın amacı, mandibular kırık yeri üzerine yaşın etkisini çalışmaktır. Çalışmaya, Nisan 1996 - Aralık 1996 arasında Bağdat'ta Specialized Hospital for Surgery'nin Maksillofasial Ünitesi'ne başvuran mandibular hasarlı 100 hasta (80'ni erkek ve diğerleri bayan) alındı. Bu hastaların çoğunluğu sivil tipi hasardı ve bir kaçı kurşun yarasıydı. Hastaların yaşının en yüksek olduğu sayı 20 ila 29 yaş arasıydı, erkekler bayarlardan daha fazla sayıdaydı. Mandibular kırığın başlıca etyolojisi kavga (%35) ve yüksekte düşme (%31) idi. Tek kırığın başlıca bölgesi açı (%42.31) idi ve çoklu kırıklarda ise kondiler ve parasimfis (27.27) idi. Mandibular kırık 30-39 yaşa göre genç yaş grubunda (20-29 yaş) daha yaygındı. Bu çalışma, kavga ve düşmenin açı ve kondilar bölgeyi etkileyen genç erkeklerdeki mandibular kırığın en yaygın nedeni olduğunu gösterdi.

Anahtar kelimeler: Yaş; kırık; mandibula

Introduction

Mandible fractures present a unique problem to the facial surgeon. They were described in ancient Egypt around 1650 BC. Hippocrates described facial injuries around 400 BC (1). The mandible is a cantilever beam that interfaces the skull base via the temporomandibular joint. This relationship creates a ring-like structure prone to certain fracture patterns (2). Fractures of the mandible are described as comminuted or simple, open (compound) or closed, favorable or unfavorable, direct or indirect, pathologic, and by location. The coronoid, condyles, subcondylar region, ramus, angle, body, symphysis, parasymphysis, and alveolus are terms commonly used to describe fracture regions (3).

The cause of the injury may be road traffic accidents, assault, falls, industrial or sports injuries but the relative number of each varies considerably between countries and areas (4). Under the age of 25, dental trauma accounts for more lost teeth than caries or gum disease. In terms of violence, young males are most at risk. Women and children are much less at risk, but can be from domestic violence. There is a male preponderance of about 3:1 in adults and 3:2 in children (5). Hagan and Huelke (6) found that in younger patients the subcondylar and lateral chin fractures were the most common site of fracture, angle and body fractures were more frequently found in older patients.

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In this study, we try to demonstrate the effect of age on mandibular fracture.

Patients and methods

The study consisted from 100 patients (80 were males and the rest were females) with mandibular injuries admitted to Maxillofacial Unit, Specialized Hospital for Surgery in Baghdad from April 1996 to December 1996. The majority of those patients were of civilian type of injury and a few of them were of bullet injury.

Written informed consent was obtained for all patients. The Ethics Committee of the Specialized Hospital for Surgery approved this study.

On admission, careful history, examination, X-ray were taken and diagnosis of mandibular fracture was made. Treatment was done either by closed reduction with intermaxillary fixation under local anesthesia and others by open reduction with internal fixation and intermaxillary fixation under general anesthesia.

Statistical analysis was done using MiniTab statistical software program 13.20. A p value ≤ 0.05 was considered to be significant.

Results

Patients with mandibular fracture, their ages range from 4 to 73 years. The highest number of patients was between 20 to 29 years, males constitute higher numbers than females. The second group of patients, their ages

were between 30 to 39 years and the last group their ages were more than 70 years as demonstrated in Table 1.

The common etiology for mandibular fractures were fight (35%), fall from height (31%), road traffic accident (14%), bullet and shell injury (7%) and the least one was pathological fracture (2%) as shown in Table 2. The common site of single fracture was angle (42.31%) and in the multiple fracture was condyler and parasymphysis (27.27%) (Table 3). Mandibular fracture is more common in younger age group (20-29 years) and then 30-39 years, angle constitute the highest number and last one is 70-79 years as demonstrated in Table 4.

Table 1. Age and sex distribution of patients with mandibular fracture.

Age in years	No.	%	Male	Female
<10	12	12	7	5
10-19	16	16	12	4
20-29	32	32	27	5
30-39	18	18	15	3
40-49	11	11	10	1
50-59	7	7	6	1
60-69	3	3	2	1
>70	1	1	1	0
Total	100	100	80	20

Table 2. Causes of mandibular fractures.

Causes	Number	%
Fight	35	35
Fall from height	31	31
Road traffic accidents	14	14
Bullet and shell injury	7	7
Industrial	4	4
Sport	3	3
Children at play	2	2
animal kick	2	2
Pathological	2	2
Total	100	100

Table 3. Types and sites of mandibular fractures.

Types	Sites	Number	%
Single	Symphysis	3	5.77
	Body	10	19.23
	Parasymphysis	9	17.31
	Angle	22	42.31
	Ramus	1	1.92
	Condyler	7	13.46
Multiple	Condyler	27	27.27
	Parasymphysis	27	27.27
	Angle	17	17.18
	Body	16	16.16
	Symphysis	6	6.06
	Ramus	5	5.05
	Coronoid	1	1.01

Discussion

The mandible is the most fractured bones in the body and the most affected age group in this study was 20-29 years which is compatible with other studies (7,8). Males (80%) are more affected than females (20%) which is similar to other results (9). This is because most women are house wives and are not greatly involved in the economic activity of the society. The mandible can

be fractured by many etiological factors and this study showed that the common causes are fight 35% due to socioeconomic and family problems, fall and road traffic accidents (RTA). Edward et al. (10) found decrease in RTA due to use of safety belt and increase in a percentage of assaults while de Almeida et al. (11) and Yamamoto et al. (12) reported an increase in RTA and falls rank a second one. This study showed that the most common site of single mandibular fracture was angle region (42.31%) which is in agreement with Goldberg and Williams' study (13), and condylar region had a higher number in multiple fracture of mandible, it is one of the areas of natural weakness of the mandible because it is thin (14) and of small cross sectional area that can be fractured easily (15).

Table 4. Relation of mandibular fracture location with age.

Age	Mandibular fracture No (%)	Site of mandibular fracture
<10 years	16 (10.60)	8- parasymphyseal 6 -condylar 1-body 1-angle
10-19 years	28 (18.54)	7-condylar 7-parasymphyseal 6-body 6-angle
20-29 years	46 (30.46)	2-symphyseal 14-angle 13-condyle 8-body 6-parasymphyseal 3-symphyseal
30-39 years	31 (20.53)	2-ramus 9-angle 6-body 6-parasymphyseal 5-condylar 3-symphyseal
40-49 years	15 (9.93)	2-ramus 4-parasymphyseal 3-body 3-condyle 1-symphysis 1-ramus 1-cronid
50-59 years	10 (6.62)	5-angle 3-parasymphysis 1-body 1-ramus
60-69 years	3 (1.99)	2-parasymphysis 1-angle
70-79 years	2 (1.33)	1-body 1-angle
Total	151 (100)	
mandibular fracture		

There are many factors that affect pattern of mandible fracture: energy absorbing characteristics of the overlying soft tissue, mobility of the condyles at the impact, possible head movement on struck and different amounts of energy applied to the mandible. The large number of angle region fracture is due to natural weakness of angle and presence of unerupted or impacted third molar tooth causes additional weakness (16). In addition to that, insertions of the messeter and

medial pterygoid muscles provide a great source of strength to the ascending ramus and the anterior limit of their insertions (17). The large number of parasymphyseal fracture is due to more of the site of trauma are in the central and lateral chin regions that considered one of the natural areas of weakness because of incisive fossa which lies immediately lateral to the mental protuberance. Alveolar process in the anterior segment of mandible containing the incisors and has facial and lingual cortical plates and very little spongy bone separating the bony sockets from these plates so causes relative weakness as compared to the posterior segment which has amount of spongy bone available to absorb traumatic forces (14).

The study showed that condylar region injuries are more seen under the age of 30 years and getting decrease above the age of 30 years while fracture angle and body are more above the age of 30 years because the incidence of extracted teeth is increased above the age of 30 years, so there is loss of alveolar process by atrophy and during trauma, there is loss of occlusal support in edentulous and partially edentulous mandible so the fracture will occur first in these regions and the momentum of the force is absorbed by the fractures in these regions and the condyle will be away or escaped from the effect of the trauma. Stanley (14) considered edentulous and partially edentulous mandible as natural areas of weakness because of loss of alveolar process by atrophy and loss of occlusal support during trauma. Adding to that, trauma is most common in younger age group (schoolchildren) that leads to injuries of permanent incisors (18). Another cause is fall from a height that leads to condylar fracture (19).

In conclusion, this study showed that fight and falls are the most common cause of mandibular fracture in younger men affecting angle and condylar region.

Acknowledgement

I thank all who help me in this study. There was no conflict of interest in this article.

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