



ARAŞTIRMA / RESEARCH

Prevalence, treatment and complications of mandibular fractures

Mandibula kırıklarının prevalansı, tedavisi ve komplikasyonları

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Abstract

Purpose: The purpose of this study was to review and analyze the prevalence, treatment and complications of mandibular fractures managed by the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Çukurova University between March 2015 and March 2017.

Material and Methods: Mandibular fractures were sorted by etiology and classified according to the fracture location. Open reduction and internal fixation (ORIF) were performed using 2.0-mm or 2.4-mm fixation systems. Closed reduction (CR) of fractures was performed using arch bars, intermaxillary fixation screws or wire-composite splints. The complications were recorded.

Results: The most common cause of mandibular fractures in this study was interpersonal violence (32.1%), followed by road-traffic accidents (26.2%) and falls (25%). The least common cause of fractures was sports accident (7.1%). The most common fracture localization was the condyle (24.5%), followed by the angle (21.8%), body (17.3%), symphysis/parasymphysis (16.4%) and alveolar bone (15.5%). Fifty patients were treated by ORIF (59.5%), 29 patients were treated by CR (34.5%). Three patients (3.6%) received no treatment. Various complications were observed in 25 (29.7%) patients. The most common complication in this study was temporary paresthesia (13.1%) followed by TMD (6.0%).

Conclusion: Following contemporary trends in mandibular trauma to understand how different centers manage patients in different socio-economic regions and different levels of clinical facilities/resources is important for conducting better healthcare policy.

Keywords: Mandible, maxillofacial, trauma, epidemiology

Öz

Amaç: Bu çalışmanın amacı Çukurova Üniversitesi Diş Hekimliği Fakültesi Ağız, Diş ve Çene Cerrahisi tarafından 2015-2017 yılları arasında tedavi edilen mandibula kırıklarının prevalansı, tedavisi ve komplikasyonlarını incelemektir.

Gereç ve Yöntem: Mandibula kırıkları etiyojoloji ve kırıkların lokalizasyonuna göre sınıflandırıldı. Açık redüksiyon ve internal fiksasyon 2.0 mm veya 2.4 mm fiksasyon sistemleri kullanılarak yapıldı. Kapalı redüksiyonda ark-bar, intermaksiller fiksasyon vidaları veya tel-kompozit splint kullanıldı. Komplikasyonlar kaydedildi.

Bulgular: Bu çalışmada mandibula kırıklarının nedenleri sırasıyla kişilerarası şiddet (27 olgu,% 32.1), trafik kazaları (22 olgu,% 26,2) ve düşme (21 olgu,% 25) olarak bulundu. Kırıkların en nadir nedeni spor kazasıydı (6 olgu,% 7.1). En yaygın kırık lokalizasyonu sırasıyla kondil (27,% 24.5), ardından angulus (24,% 21.8), korpus (19,% 17.3), simfiz/parasimfiz (18,% 16.4) ve alveolar kemik (17, %15.5) idi. Elli hastada açık redüksiyon (% 59.5) uygulanırken, 29 hastada kapalı redüksiyon (% 34.5) yapıldı. Üç hasta (% 3,6) tedavi görmedi. Hastaların 25'inde (% 29.7) değişen derecelerde komplikasyonlar gözlemlendi. Bu çalışmada en sık rastlanan komplikasyon geçici parestezi (% 13.1) olmuştur. Bunu temporomandibular eklem rahatsızlığı (% 6.0) izlemiştir.

Sonuç: Farklı merkezlerin hastalarını farklı sosyo-ekonomik bölgelerde ve farklı klinik imkan / kaynak düzeylerinde nasıl yönettiğini anlamak ve güncel tedavi yöntemlerini takip etmek önemlidir. Mandibula kırıklarının görülme sıklığı ve nedenleri, toplum içindeki travma modellerini yansıması açısından daha iyi sağlık politikası stratejileri yürütmek için yol gösterici olabilir.

Anahtar kelimeler: Mandibula, alt çene, kırık, fraktür, maksillofasiyal, travma, epidemiyoloji

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INTRODUCTION

Maxillofacial trauma often leads to morbidity and varying degrees of esthetic and functional deformity. The etiology of maxillofacial trauma have been changing over the past decades. Also the patterns of maxillofacial fractures differ among economic, social and cultural variance of the examined population and geographic regions¹⁻⁸. Maxillofacial trauma can be managed by different specialities with different treatment approaches based mostly on availability and experience of institutions^{6, 9, 10}. Mandibular bone is among the most commonly fractured bones during maxillofacial trauma, and consists the majority of traumatic injuries treated by the oral and maxillofacial surgeons^{1, 2, 6}. The high rate of mandibular fractures can be explained by being the only mobile bone and having limited support when compared to other facial bones⁷.

Several studies have investigated the epidemiology of mandibular fractures in different countries and populations. However, there is still limited data regarding the epidemiology and treatment of mandibular fractures in developing countries, especially in Turkey. Some authors have investigated and analysed the demographics of mandibular fractures according to different criteria, from different regions of Turkey^{1, 6, 8, 11-14}. However, the information about the etiology, epidemiology and complications of these injuries, especially from the East Mediterranean Region of Turkey is still lacking. The etiology of fractures varies significantly between countries but road traffic accidents (RTA) and interpersonal violence (IPV) are the most frequent causes of mandibular fractures. RTA is the most common cause of mandibular fractures in most papers published in Turkey^{1, 6, 8, 9, 11, 15}.

Historically, different treatment modalities for the management of a mandibular fracture have been described. Although in the past the majority of the fractures of the mandible were managed with closed reduction and maxillomandibular fixation, surgical management and internal fixation with an osteosynthesis material is the preferred method today¹⁶⁻¹⁸. The overall complication rate for mandibular fractures in the literature is reported to be between 9 to 36%¹⁸. However the data about the complications in this region of Turkey is lacking. In this context, the purpose of this study was to review and analyze the prevalence, treatment and complications of mandibular fractures managed by

the department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Çukurova University.

MATERIALS AND METHODS

This retrospective study was approved by the Ethical Committee of Çukurova University (Decision no: 62-9). The study sample consisted of mandibular trauma patients treated at the Oral and Maxillofacial Surgery Department of Çukurova University Faculty of Dentistry between March 2015 and March 2017. The medical records, cone beam computer tomography and panoramic radiographs were investigated to collect data including patient gender, age, etiology of trauma, fracture localization, treatment method, method of fixation and complications. Only acute cases were included in the study, patients who had been operated before or referred for a revision surgery were not included. Patients with less than 6 months of follow-up and patients with missing information were excluded from the study.

Mandibular trauma was sorted by etiology: Road traffic accidents (RTA), falls, interpersonal violence (IPV), sports accidents and others (e.g. work accidents, tooth extraction, pathology)^{6, 19}. Mandibular fractures were classified according to the fracture location: Condyle, coronoid process, alveolar process, symphysis/parasymphysis, ramus, angle, and body. All patients were treated by oral and maxillofacial surgeons, or residents under supervision. Open reduction and internal fixation (ORIF) of mandibular fractures was performed using 2.0-mm or 2.4-mm fixation systems. Closed reduction of fractures was performed using arch bars, intermaxillary fixation screws or wire-composite splints.

The following complications were extracted from the records: Temporary paresthesia (paresthesia that resolves within 6 months), permanent paresthesia, malocclusion, infection, temporomandibular joint disorder (TMD), plate exposure and root damage¹⁸. Temporary or permanent paresthesia of the inferior alveolar nerve was determined as a patient compliant as reduced sensitivity of the lip and chin region and no objective analyses were performed.

Statistical analysis

All analyses were performed using SPSS 20.0 statistical software (SPSS, IBM, Chicago, IL). Categorical variables were expressed as numbers and percentages, whereas continuous variables were summarized as mean and standard deviation where

appropriate. Pearson chi-square test was used to compare categorical variables between the groups in Table 5 and 6.

RESULTS

A total of 84 patients with mandibular fractures were identified. All patients were treated under elective conditions. No patient had a life-threatening issue like airway obstruction, bleeding, etc. at the time of referral. The patients who needed emergency care were referred to our department after emergency treatment. Patients without urgency applied to the clinic themselves by simply walking in. The mean patient age was $32.8 \pm (13.8)$ (Range 6-67). Males constituted 77.4% (n=65) and females constituted 22.6% (n=19) of the patients. Males had a 3.4 fold higher incidence of mandibular fractures compared to females. The peak incidence of mandibular

fractures was seen in 21 to 30 years age group (Table 1).

The most common cause of mandibular fractures in this study was IPV (27 cases, 32.1%), followed by RTA (22 cases, 26.2%) and falls (21 cases, 25%). The least common cause of fractures was sports accident (6 cases, 7.1%). Other causes of fractures including work accidents, pathology and tooth extraction had an incidence of 9.5% (8 cases) (Table 2). The most frequent cause of fractures among men was IPV, followed by RTA and falls. The most frequent cause of fractures among women was falls, followed by IPV and RTA. No sports accident was seen in women in this study. All sports accidents seen in men occurred during a soccer match on an astroturf. Two work accidents, 3 fractures due to pathology, and 3 iatrogenic fractures (two impacted tooth extraction and one implant surgery) were among the other rare causes of mandibular fractures.

Table 1. Patient distribution according to age groups.

Age	Number of Cases	Percent %
0-10	3	3.6%
11-20	11	13.1%
21-30	31	36.9%
31-40	16	19%
41-50	12	14.3%
51-60	7	8.3%
61-70	4	4.8%
Total	84	100%

Table 2. Mandibular fractures, distributed by etiology of trauma and gender.

Etiology		Gender		Total
		Male	Female	
Fall	Count	14	7	21
	% within gender	21.5%	36.8%	25.0%
	% of Total	16.7%	8.3%	25.0%
Road Traffic Accident	Count	18	4	22
	% within gender	27.7%	21.1%	26.2%
	% of Total	21.4%	4.8%	26.2%
Interpersonal Violence	Count	21	6	27
	% within gender	32.3%	31.6%	32.1%
	% of Total	25.0%	7.1%	32.1%
Sports Accident	Count	6	0	6
	% within gender	9.2%	0.0%	7.1%
	% of Total	7.1%	0.0%	7.1%
Other	Count	6	2	8
	% within gender	9.2%	10.5%	9.5%
	% of Total	7.1%	2.4%	9.5%
Total	Count	65	19	84
	% within gender	100.0%	100.0%	100.0%
	% of Total	77.4%	22.6%	100.0%

A total of 110 fracture lines were identified in 84 patients. Fracture patterns seen in patients were shown in Table 3. Two patients had three fracture lines, 22 patients had two fracture lines and 60 patients had a single fracture line in the mandible.

The most common fracture localization was the condyle (27, 24.5%), followed by the angle (24, 21.8%), body (19, 17.3%), symphysis/parasymphysis (18, 16.4%) and alveolar bone (17, 15.5%). Ramus and coronoid process fractures were rare entities. Frequency of fractures was shown in Figure 1.

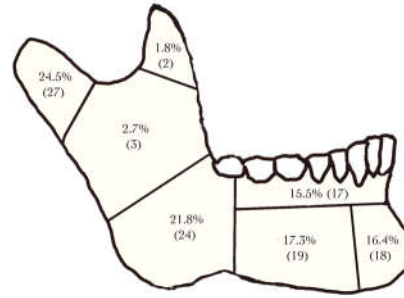


Figure 1. The frequency of fracture lines according to regions of mandible.

Table 3. Fracture patterns according to patients

Location	Frequency	Percent %
Angle	18	21.4%
Alveolar bone	16	19.0%
Condyle	14	16.7%
Body	11	13.1%
Symphysis+Condyle	7	8.3%
Body+Angle	4	4.8%
Symphysis	2	2.4%
Symphysis+Angle	2	2.4%
Symphysis+Ramus	2	2.4%
Bilateral Symphysis	1	1.2%
Symphysis+Bilateral Condyle	1	1.2%
Symphysis+Coronoid	1	1.2%
Bilateral Body	1	1.2%
Body+Ramus	1	1.2%
Body+Condyle+Alveolar bone	1	1.2%
Bilateral Condyle	1	1.2%
Condyle+Coronoid	1	1.2%
Total	84	100.0

Table 4. Distribution of etiologic factors and fixation methods according to fracture localization

	Symphysis	Body	Angle	Ramus	Condyle	Coronoid	Alveolar Bone	Total	p*
Etiology, n (%)									0.56
RTA	10(28.6)	6(17.1)	7(20.0)	1(2.9)	9(25.7)	1(2.9)	1(2.9)	35(100.0)	
IPV	4(12.5)	4(12.5)	9(28.1)	0(0.0)	6(18.8)	1(3.1)	8(25.0)	32(100.0)	
Falls	3(11.1)	5(18.5)	4(14.8)	1(3.7)	8(29.6)	0(0.0)	6(22.2)	27(100.0)	
Sports accident	0(0.0)	1(16.7)	1(16.7)	0(0.0)	3(50.0)	0(0.0)	1(16.7)	6(100.0)	
Other	1(10.0)	3(30.0)	3(30.0)	1(10.0)	1(10.0)	0(0.0)	1(10.0)	10(100.0)	
Fixation method, n (%)									0.23
Wire-composite splint	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	16(100.0)	16(100.0)	
IMF screw	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(100.0)	0(0.0)	0(0.0)	2(100.0)	
Arch bar	0(0.0)	1(4.5)	0(0.0)	0(0.0)	20(90.9)	1(4.5)	0(0.0)	22(100.0)	
Reconstruction plate	0(0.0)	2(100.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(100.0)	
Two miniplates	18(42.9)	14(33.3)	3(7.1)	3(7.1)	4(9.5)	0(0.0)	0(0.0)	42(100.0)	
One miniplate	0(0.0)	1(4.5)	21(95.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	22(100.0)	

* Pearson chi-square; (Each fracture line was analysed as a separate entity).

Treatment and method of fixation

Fifty patients were treated by ORIF (59.5%), 29 patients were treated by closed reduction (34.5%). Three patients (3.6%) who had no displacement and good occlusion received no treatment. The method of fixation according to fracture localizations was shown in Table 4.



Figure 2. Angle fracture repaired by a single 2.0 miniplate according to the method described by Champy²⁰. Note the occlusal relationship of the upper and lower teeth after fixation.

All alveolar bone fractures were treated by wire-composite splint. One coronoid process fracture received no specific treatment other than soft diet and follow-up and the other received closed reduction because of a concomitant condyle fracture. Twenty-two of the condylar fractures (80.8%) were treated by closed reduction achieved by maxillomandibular fixation, either with Erich arch bars (73.1%) or IMF screws (7.7%). Five condyle fractures (19.2%) were treated by ORIF with two 2.0mm miniplates. All ramus and angle fractures were treated by ORIF.

Twenty-one angle fractures were treated by a single miniplate (87.5%) with the method described by Champy²⁰ (Figure 2), whereas 3 angle fractures (12.5%) and all ramus fractures were treated by two miniplates. Fourteen body fractures were treated by two miniplates (77.8%), two body fractures were treated by reconstruction plates (11.1%) (Figure 3) and one body fracture was treated by a single miniplate (5.6%). All symphysis/parasymphysis fractures were treated by two miniplates (Figure 4).

Complications

Complications in varying severity were observed in 25 (29.7%) patients. The most common complication in this study was temporary paresthesia (13.1%) followed by TMD (6.0%). Other mentioned complications were seen infrequently (Table 5). Fracture localization, etiology and method of fixation according to the complications were summarized in Table 6.

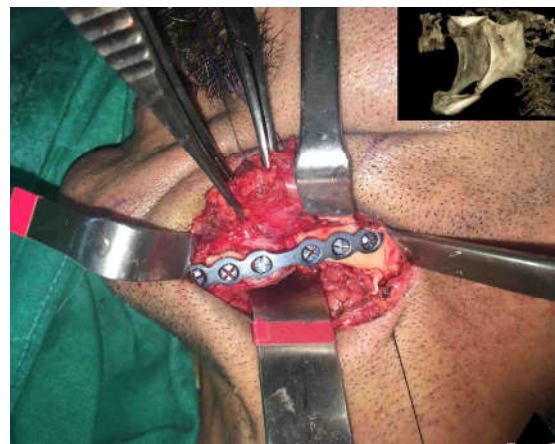


Figure 3. An atrophic mandibular fracture fixed by a 2.4mm non-locking reconstruction plate through a submandibular approach. Mental nerve is preserved (Arrowhead).

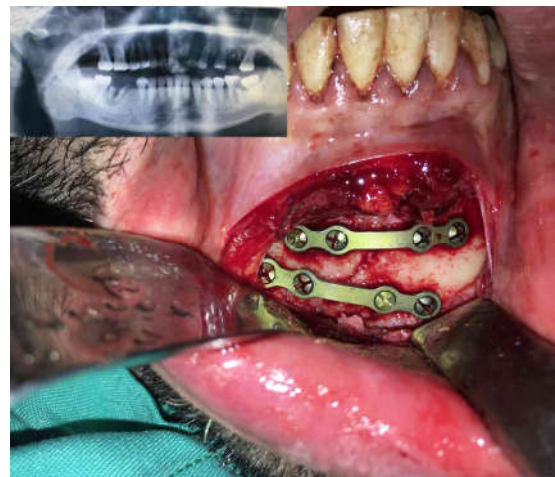


Figure 4. Symphysis/parasymphysis fracture fixed by two 2.0mm miniplates.

Table 5. Frequency of complications

Complication	n	% Within Total Cases	% Compli cations
Temporary Paresthesia	11	13.1%	44.0%
Malocclusion	2	2.4%	8.0%
Infection	1	1.2%	4.0%
TMJ Disorder	5	6.0%	20.0%
Plate Exposure	2	2.4%	8.0%
Permanent Paresthesia	2	2.4%	8.0%
Root Damage	2	2.4%	8.0%
Total	25	29.8%	100.0%

In general men had an increased complication rate compared to women. Temporary paresthesia, permanent paresthesia and malocclusion were seen

more frequently in men compared to women. Women had significantly increased TMD compared to men. Most of the complications in this cohort were seen in patients who had a RTA, followed by falls and IPV. Highest complication rate was seen in fractures localized in condyle and symphysis/parasymphysis regions. Temporary paresthesia was most frequently seen in symphysis/parasymphysis fractures followed by body and condyle fractures. Two cases of malocclusion were seen in a condyle and a symphysis/parasymphysis fracture. A case of infection was occurred in a body fracture. TMD was most commonly seen in condyle fractures. Plate exposure was seen in two cases of angle fractures. Highest complication rate with regards to the method of fixation was seen with two miniplates.

Table 6. Distribution of etiologic factors, localization and fixation methods according to complications

	Temporary Paresthesia	Malocclusion	Infection	TMD	Plate Exposure	Permanent paresthesia	Root Damage	Total	p
Etiology n (%)									0.235
RTA	7 (18.9)	2 (5.4)	0 (0)	3 (8.1)	0 (0)	2 (5.4)	1 (2.7)	15 (40.5)	
Falls	7 (18.9)	0 (0)	0 (0)	1 (2.7)	1 (2.7)	0	0	9 (24.3)	
IPV	0 (0)	2 (5.4)	0 (0)	1 (2.7)	1 (2.7)	1 (2.7)	1 (2.7)	6 (16.2)	
Others	5 (13.5)	0 (0)	1 (2.7)	1 (2.7)	0 (0)	0 (0)	0 (0)	8 (18.9)	
Localization n (%)									0.084
Condyle	4 (10.8)	2 (5.4)	0 (0)	4 (10.8)	0 (0)	0 (0)	1 (2.7)	11 (29.7)	
Ramus	2 (5.4)	0 (0)	0 (0)	0 (0)	2 (5.4)				
Angle	0 (0)	0 (0)	0 (0)	0 (0)	2 (5.4)				
Body	2 (5.4)	0 (0)	0 (0)	0 (0)	2 (5.4)	2 (5.4)	0 (0)	6 (16.2)	
Symphysis	4 (10.8)	0 (0)	1 (2.7)	0 (0)	0 (0)	1 (2.7)	1 (2.7)	7 (18.9)	
Fixation n (%)									0.001
IMF screw	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (2.7)	1 (2.7)	
Archbar	2 (5.4)	2 (5.4)	0 (0)	3 (8.1)	0 (0)	0 (0)	0 (0)	7 (18.9)	
Recon. plate	1 (2.7)	0 (0)	1 (2.7)	0 (0)	0 (0)	0 (0)	0 (0)	2 (5.4)	
Two miniplates	15 (40.5)	2 (5.4)	0 (0)	3 (8.1)	0 (0)	2 (5.4)	1 (2.7)	23 (62.2)	
One miniplate	1 (2.7)	0 (0)	0 (0)	0 (0)	2 (5.4)	1 (2.7)	0 (0)	4 (10.8)	

* Pearson chi-square; (Each fracture line was analysed as a separate entity).

DISCUSSION

In addition to esthetic, psychological and functional problems, facial trauma often results a financial burden to individuals and society in the form of treatment costs and loss of work power². Therefore, it is of high significance to identify the epidemiology, etiology, treatment choices and complications of maxillofacial injuries.

Consistent with the results of this study, the scientific literature seems to be in agreement that the majority of the mandibular fractures occur in males between 21 and 30 years of age^{2-4, 7, 21-24}. Males had a 3.4 fold higher incidence of mandibular fractures compared to females in this study. This finding is in line with studies reported by Erol et al.⁶ (Turkey), Ellis et al.⁷ (USA), and Oikarinnen et al.²⁵ (Finland). On the other hand, Chrcanovic et al.²⁶ (Brazil), Ogundare et

al.⁴ (USA), Kamulegeya et al.²³ (Uganda), and Elgehani and Orafi²⁴ (Libya) reported much higher ratios in terms of male predilection; whereas Zix et al.¹⁹ (Switzerland), Bormann et al.²⁷ (Germany) and Eriksson and Wilmar¹⁰ (Sweden) have reported lower ratios. Young male predominance in the current study may be explained by the more frequent involvement in high speed driving, IPV, sports and other outdoor activities than older patients and females. Most common cause of mandibular fractures in this study was IPV followed by RTA and falls. The least common cause of fractures was sports accidents. The most frequent cause of fracture in women was falls followed by IPV and RTA. This can be explained by the fact that women do not involve in interpersonal violence. No sports accident was seen in women in this study.

The epidemiologic information on maxillofacial injuries has changed with the onset of motor vehicle seat belt and airbag laws, reduced speed limits, and increasing urban violence. RTA is the most common cause of maxillofacial fractures in most papers published in Turkey^{1, 6, 8, 9, 11, 15}. In a study from the capital city of Turkey between 1991 and 2000, Şimşek et al.¹ reported that the most common cause of mandibular fracture was RTA (36.2%). They attributed this result to the low compliance rate of seat belt use which was 18% at 2004. The latest report (2016) by Turkish Security General Directorate indicates that the seat belt compliance rate has increased to 50.1% for driver seat and 40.6% for front passenger seat²⁸. This may explain the decreased fracture rate caused by RTA in the present study.

The etiology of fractures varies significantly between countries but RTA and IPV are the most frequent causes of facial fractures. However socio-economic, geographic and behavioral differences, make the comparison of data between studies extremely difficult. For example, Zix et al.¹⁹ (Switzerland) reported that 21% of all mandibular fractures were related to sports accidents, majority of which were winter sports. They also added that the actual number was probably higher because many of the cycling accidents were probably falsely categorised as RTA, but were in fact sports accidents. Sports accidents consists the smallest group in the present study and it almost never snows in the metropolitan area of Adana and there are no winter sport centers nearby so it is unlikely to see a mandibular fracture caused by winter sports in this region.

The anatomic localization and incidence of mandibular fractures varies in the literature. Many authors reported the angle as the most frequently affected site²⁹⁻³², whereas others reported the mandible body^{3, 7, 33, 34}, and condyle^{19, 22, 26, 27, 35, 36}. In the present study, the condyle was the most frequently fractured site (25.5%) followed by mandibular angle (21.8%). Usually, condyle fractures were accompanied by another fracture lines thus making them a more frequently seen entity. Condyle/symphysis fractures were the most common fracture pattern when there was more than one fracture line in a mandible.

Several authors have tried to identify a relationship between the etiology of trauma and regions affected in mandibular fractures^{19, 29, 36, 37}. According to these authors condylar fractures were most likely to result from falls. Fridrich et al. reported that the angle fractures were more common as a result of IPV²⁹. Muante-Cardenas reported that RTA resulted in angle fractures most commonly³⁷. IPV resulted in angle fractures, falls resulted in condylar fractures and RTA resulted in symphysis/parasymphysis fractures more frequently in the present study (Table 4).

Although surgical management is trending, both surgical and conservative management are well accepted treatment methods in the literature. In our study majority of the patients were treated by ORIF (59.5%), followed by closed reduction (34.5%). Three patients (3.6%) who had no displacement and good occlusion received no treatment. Majority of the condylar fractures (80.8%) were treated by closed reduction achieved by maxillomandibular fixation either with Erich arch bars or IMF screws. Five condyle fractures (19.2%) were treated by ORIF with two 2.0mm miniplates. Treatment of condylar fractures continues to be a controversial topic. Method of treatment is generally based on the experience of the surgeon. There are many studies in the literature that report both closed reduction and open reduction lead to good results in the treatment of condylar fractures.

Even though infection has been reported as the most frequent postoperative complication after mandibular fractures in some studies it was a rare complication in the present study^{31, 38, 39}. Lamphier et al. reported that ORIF has higher complication rates than CR which seems to be in line with the present study³¹. The most common complication in this study was temporary paresthesia (13.1%) followed by TMD (6.0%). Van den Bergh et al. reported that 15.1% of

patients had temporary paresthesia of the lip-chin region of the operated side¹⁸. Motamedi et al. reported that the most common complication was neurosensory disturbances of the inferior alveolar nerve (16.01%)⁴⁰. In general men had an increased complication rate compared to women in this cohort. Temporary paresthesia, permanent paresthesia and malocclusion were seen more frequently in men compared to women. Women had significantly increased TMD compared to males. Most of the complications in this cohort were seen in patients who had RTA. This result can be explained by the high energy impact seen in RTA which leads to more morbidity and displacement. Highest complication rate was seen in fractures localized in condyle and symphysis/parasymphysis regions. Temporary paresthesia was most frequently seen in symphysis/parasymphysis fractures followed by body and condyle fractures. TMD were most commonly seen in condyle fractures. Plate exposure was seen in two cases of angle fractures because of the shallow placement of a miniplate in Champy technique. Highest complication rate with regards to the method of fixation was seen with two miniplates. There are some limitations of this study. This is a retrospective study therefore the data relies on patient records. Some records were incomplete and had to be excluded from the study. Paresthesia were recorded as a patient complaint and no objective testing was performed. The minimum patient follow-up was 6 months therefore any long term complication could not be identified for some patients. Prospectively designed studies with longer followup is needed in order to overcome these limitations.

It is important to follow the contemporary trends to understand and appreciate how different centers respond and manage their patients in different socio-economic regions and different levels of clinical facilities/resources. The incidence and causes of mandibular fractures may reflect the trauma patterns within the community, which is important for conducting better health policy strategies.

Yazar Katkıları: Çalışma konsepti/Tasarımı: HCT,MEB; Veri toplama: HCT, MEB; Veri analizi ve yorumlama: HCT, MEB; Yazı taslağı: HCT, MEB; İçeriğin eleştirel incelenmesi: HCT, MEB; Son onay ve sorumluluk: HCT, MEB; Teknik ve malzeme desteği: HCT; Süpervizyon: HCT; Fon sağlama (mevcut ise): yok.

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