

DETERMINATION OF INCIDENCE OF COMPLICATIONS AND LIFE QUALITY AFTER MANDIBULAR IMPACTED THIRD MOLAR SURGERY*

Mandibuler Gömülü Üçüncü Molar Dişlerin Çekimi Sonrası Gelişen Komplikasyonların İnsidansının ve Hastaların Yaşam Kalitesinin Belirlenmesi

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Makale Gönderilme Tarihi: 15/11/2013

Makale Kabul Tarihi: 27/12/2013

ABSTRACT

Purpose: The aim of this study is determination of the frequency of occurrence, severity and type of complications developing after mandibular impacted third molar teeth surgery, examination of their reasons, prevention of observed complications, and to increase the patients post-operative quality of life.

Material and Methods: The study involved 121 mandibular impacted third molar teeth of a total of 105 patients (77 female, 28 male). The age, gender, medical history, bad habits, classification of impacted third molar teeth, postoperatif complications such as pain, edema, trismus and paresthesia, oral hygiene in addition to oral contraceptive use and menstruation periods of patients were recorded.

Results: Statistically significant results were seen between existence of edema (94, 5.5±3.06, p=0.004) and bleeding complication (29, 6.24±2.77, p=0.019), between the operation period and existence of edema (94, 30.65±15.49, p=0.005) also between the operation period and paresthesia complication (10, 41.2±5.15, p=0.006).

Conclusion: The post-operative findings affecting quality of life are pain, edema, trismus, and paresthesia. A careful surgical technique and operative diligence coupled with implementation by the patients of post-operative directives reduce the frequency and intensity of complications.

Keywords: *Mandibular impacted third molar; complication, visual analogue scale, life quality*

ÖZ

Amaç: Bu çalışmanın amacı; mandibuler gömülü üçüncü molar diş cerrahisi sonrası gelişen komplikasyonların görülme sıklığı, şiddeti ve çeşidinin saptanması, nedenlerin araştırılması, görülen komplikasyonların önlenmesi ve hastaların cerrahi operasyon sonrası yaşam kalitesinin belirlenmesidir.

Gereç ve Yöntem: Çalışma, yaşları 16 ile 83 arasında değişen, 77'si bayan, 28'i erkek toplam 105 hastanın 121 mandibuler gömülü üçüncü molar dişi üzerinde yürütüldü. Tüm hastaların yaşı, cinsiyeti, sistemik durumu, kötü alışkanlıkları, ağız hijyenleri, oral kontraseptif kullanımı ve menstrüasyon dönemleri ayrıca mandibuler gömülü üçüncü molar sınıflaması, ağrı, ödem, trismus, parestezi gibi postoperatif komplikasyonlar kaydedildi.

Bulgular: Ödem varlığı (94, 5.5±3.06, p=0.004) ve kanama komplikasyonu arasında (29, 6.24±2.77, p=0.019), operasyon süresi ile ödem varlığı arasında (94, 30.65±15.49, p=0.005) ve operasyon süresi ile parestezi komplikasyonu arasında (10, 41.2±5.15, p=0.006) istatistiksel olarak anlamlı bir fark kaydedildi.

Sonuç: Yaşam kalitesinin kötüleşmesine neden olan postoperatif bulgular, ağrı, ödem, trismus ve parestezi olup, dikkatli bir cerrahi teknik, operatif özen ve hastaların postoperatif önerileri uygulaması komplikasyonların sıklığını ve şiddetini azaltacaktır.

Anahtar kelimeler: *Mandibuler gömülü üçüncü molar; komplikasyon, görsel analog skala, yaşam kalitesi*

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* Berkem ATALAY DDS, Kemal ŞENÇİFT Prof. Incidence of complications and life quality after mandibular impacted third molar surgery. Belgrade, Serbia, 2008. XII. Congress of Serbian Association of Maxillofacial Surgeons with International Participation First Meeting of Maxillofacial Surgeons of Balkans. Oral Presentation.

Introduction

Third molar operation removal is the most commonly performed surgical procedure and the mandibular third molar are mostly seen (1). The most commonly seen complications during third molar removal are edema, trismus, infection, bleeding and paresthesia. Less common complications are infection, iatrogenic damage of the second molar and bone fractures (2). It has been argued that the factors that sum up these complications are complicated. However, the basic factor is the inflammatory process caused by surgical trauma (3).

These postoperative complications can result in a longer treatment process, social and financial difficulties and a corresponding decrease in patient's life quality. Therefore it is important to determine the patients with higher complication risk factors (3). The studies about the postoperative complications focused on systemic risk factors such as gender, age and systemic diseases, and local risk factors such as the position and impaction rate of the tooth. It is known that analyzing these factors and determining the complexity of the third molar plays an important role in the success rate of the surgical procedure and decreases complication risks.

The "quality of life" of a patient has many aspects, and in the last 10 years the measurement techniques have been greatly improved. Today there are many surveys about quality of life. These surveys are widely used by oral surgeons and give information about the effects of the treatment procedure on

the life quality of the patients, and about the importance of oral health. The most important point in the preparation of a survey is comprehensibility (4).

The aim of this study is to determine the incidence, degree and kinds of postoperative complications, to investigate the causes of these complications and to prevent them. We also aim to enlist the effect of the surgical procedure in the first 24 hours and the degree of the pain and discomfort caused by the postoperative complications according to the answers of the questions in the survey.

Material and Methods

The study was performed at the Yeditepe University, Faculty of Dentistry, Oral and Maxillofacial Surgery Department, on patients who have mucosal, partial bony or complete bony impacted third molar teeth. The age interval of the patients was between 16 and 83. In total, 77 of 105 patients were female and 28 patients were male. The number of these patients' teeth included in the study was 121.

The age, gender, systemic conditions, oral hygiene, bad habits, use of oral contraceptives and menstruation periods of the patients were all recorded (Table 1). Based on the classification of the American Anesthesiology Association, class I and class II patients were accepted to the study group. To determine the positions of the third molars, Pell-Gregory and Winter classifications were used.

Table 1. The distribution of patients as gender, age, unilateral mastication, bad habits, oral contraceptive use, menstruation, systemic diseases and oral hygiene.

		Number of Patients	%
Gender	Male	28	26.7
	Female	77	73.3
Age	Age 16-20	25	23.8
	Age 21-30	63	60
	Age 31-40	7	6.7
	Age >41	10	9.5
Unilateral Mastication	No	75	71.4
	Right	19	18.1
	Left	11	10.5
Bad Habits	No	70	66.7
	Smoking	24	22.9
	Alcohol	3	2.9
	Smoking + Alcohol	8	7.6
Oral Contraceptive Use	Yes	4	5.2
	No	73	94.8
Menstruation	Yes	11	14.3
	No	66	85.7
Systemic Diseases	No	82	78.1
	Yes	23	21.9
Oral Hygiene	Good	67	63.8
	Moderate	31	29.5
	Bad	7	6.7

All surgical procedures were performed in two sterile operation rooms. The extractions of the impacted third molars were made with the standard surgical technique under the inferior alveolar nerve blockage and buccal nerve anesthesia (Ultracaine® D-S, Ultracaine® D-S Forte, Isocaine®). The triangle mucosal flap was lifted and alveolar bone removal and/or tooth split was made. The bone removal was performed with tungsten carbide burr, with a low speed dental motor under the sterile saline solution irrigation. For the closure of the flap, 3.0 silk suture was used. The patients were informed about postoperative wound care, and extraoral cooling in the first 24 hour was suggested. Antibiotics, non-steroidal anti-inflammatory medications

and 0.2% chlorhexidine mouthwash were all written in a prescription. The sutures were removed at the 7th day after the surgery.

Before the operations patients were taken informed consent that the questionnaire was designed to determine quality of life after mandibular third molar surgery. Patients filled out the survey forms on the 7th day after the surgery, when they came for suture removal and postoperative control. Postoperative complications and the results of the survey were evaluated by the same surgeon. Based on the patients' answers to 10 questions and VAS scores, the postoperative pain, the effect of the medicaments, the general condition and the experience of the patients were noted down.

Statistical Analysis

In this research, the GraphPad Prism V.2 software program was used for the statistical analysis. For data evaluation, descriptive statistics (mean, standard deviation) were computed together with ANOVA (one-way analysis of variance) when comparing the groups. In the sub-group comparisons, Tukey's multiple comparison test was used. In comparing pairs, the independent t test and in qualitative data analysis chi-square test were utilized. Results were given with 5% significance ($p < 0.05$).

Results

In total, 121 impacted third molar tooth extractions were performed on 28 male and 77 female patients. Fifty-five (45.5%) of

these teeth were located at the left side of the mandible, while the other 66 (54.5%) were located on the right side.

According to the Pell-Gregory classification the third molars existed mostly at the A position (47.1%), class I (45.4%), partial bony impacted (50.4%). According to the Winter classification, they were mostly in a vertical position (52.9%).

On the 7th day postoperative, the relationship between petechiae, ecchymosis, infection, edema, hemorrhage, trismus, paresthesia, alveolitis, mandibular fracture and the number of the extracted teeth was listed in table 2. The infection and petechiae (0.8%) were the rarest complications, while edema (77.7%) was the most common. The distribution of oral hygiene with edema, paresthesia, trismus and hemorrhage has been shown in table 3.

Table 2. The distribution of the mandibular third molar teeth extractions according to the type of postoperative complications.

		Number of	
		Teeth	%
Petechiae, Echymosis	No	120	99.2
	Yes	1	0.8
Infection (soft tissue)	No	120	99.2
	Yes	1	0.8
Edema	No	27	22.3
	Yes	94	77.7
Hemorrhage	No	92	76
	Yes	29	24
Trismus	No	113	93.4
	Yes	8	6.6
Paresthesia	No	111	91.7
	Yes	10	8.3
Alveolitis	No	121	100
	Yes	0	0
Mandibular Fracture	No	121	100
	Yes	0	0

Table 3. Distribution of oral hygiene with edema, paresthesia, trismus and hemorrhage.

Edema	Oral Hygiene		
	Good	Moderate	Bad
No	19	7	1
	%24.4	%19.4	%14.3
Yes	59	29	6
	%75.6	%80.6	%85.7

$\chi^2:0.61$ $p=0.734$

Paresthesia	Oral Hygiene		
	Good	Moderate	Bad
No	72	32	7
	%92.3	%88.9	%100
Yes	6	4	
	%7.7	%11.1	

$\chi^2:1.04$ $p=0.592$

Trismus	Oral Hygiene		
	Good	Moderate	Bad
No	74	32	7
	%94.9	%88.9	%100
Yes	4	4	
	%5.1	%11.1	

$\chi^2:1.95$ $p=0.376$

Hemorrhage	Oral Hygiene		
	Good	Moderate	Bad
No	57	28	7
	%73.1	%77.8	%100
Yes	21	8	
	%26.9	%22.2	

$\chi^2:2.64$ $p=0.267$

The results of the survey that the patients filled out on the 7th day after the surgery are shown in table 4. Sixty-five patients (53.7%) described themselves as “good” in the 24 hour period after the surgery, while 83 (68.6%) patients noted pain at the extraction area. Seventy-one patients (58.7%) noted that the medicaments given after the surgery were “effective.” Fourteen patients (11.6%)

indicated that they took another analgesic. Thirty-four patients (28%) complained about headache, 43 patients (35.5%) about sore throat and 58 patients (47.9%) about weakness after the surgery. Seventy-four patients (61.2%) could sleep well on the first night after the operation and 78 patients (64.5%) declared that the postoperative period was better than expected.

Table 4. Questionnaire used to determine the quality of life of patients in the postoperative period.

How did you feel after the surgery?	Very Good	13	10.7
	Good	65	53.7
	Bad	43	35.5
Did you have any pain at the extraction area?	Yes	83	68.6
	No	38	31.4
Was the analgesics effective controlling your pain?	Very Effective	43	35.5
	Effective	71	58.7
	Uneffective	7	5.8
Did you take any other analgesics other than given after the surgery?	Yes	14	11.6
	No	107	88.4
Did you have any headache after the surgery?	Yes	34	28.1
	No	87	71.9
Did you have any throatache after the surgery?	Yes	43	35.5
	No	78	64.5
Did you feel weakness?	Yes	58	47.9
	No	63	52.1
Did you sleep well at the first night after the surgery?	Yes	74	61.2
	No	47	38.8
Did you have any other discomfort after the surgery?	Yes	6	5
	No	115	95
How do you describe this surgery experience?	Better than expected	78	64.5
	Like expected	34	28.1
	Worse than expected	9	7.4

The general VAS mean was 5.07 ± 3.08 . The VAS mean of the patients with edema was statistically higher than the VAS mean of the patients with no edema. The VAS mean of the patients who had hemorrhage at the time of the operation were statistically higher than VAS mean of the patient group in which

no hemorrhage was observed. There was no statistically significant difference between the groups of gender, trismus and paresthesia complications and VAS scores (Table 5) and also in table 6 the distribution of VAS scores for questionnaire used to determine the quality of life of patients has been shown.

Table 5. The distribution of VAS scores for gender, edema, hemorrhage, trismus and paresthesia.

VAS		N	Avrg±SD	t	p
Gender	Male	28	4.27±2.86	-1.66	0.099
	Female	77	5.34±3.13		
Edema	No	27	3.59±2.76	-2.91	0.004
	Yes	94	5.5±3.06		
Hemorrhage	No	92	4.71±3.11	-2.37	0.019
	Yes	29	6.24±2.77		
Trismus	No	113	5.01±3.03	-0.88	0.383
	Yes	8	6±3.96		
Paresthesia	No	111	5.15±3.1	0.93	0.353
	Yes	10	4.2±2.97		

Table 6. The distribution of VAS scores for questionnaire used to determine the quality of life of patients.

VAS		N	Avrg±SD	t	p
How did you feel after the surgery?	Very Good	13	2.38±2.14	F:41.7 (ANOVA)	0.0001
	Good	65	3.89±2.53		
	Bad	43	7.67±2.22		
Did you have any pain at the extraction area?	Yes	83	6.18±2.8	6.83	0.0001
	No	38	2.66±2.22		
Was the analgesics effective controlling your pain?	Very Effective	43	4.49±3	F:2.94 (ANOVA)	0.056
	Effective	71	5.2±3.07		
	Uneffective	7	7.43±3.05		
Did you take any other analgesics other than given after the surgery?	Yes	14	6.86±3.13	2.34	0.021
	No	107	4.84±3.03		
Did you have any headache after the surgery?	Yes	34	6.24±3.31	2.64	0.009
	No	87	4.62±2.9		
Did you have any throatache after the surgery?	Yes	43	5.67±3.5	1.59	0.114
	No	78	4.74±2.82		
Did you feel weakness?	Yes	58	5.88±3.17	2.83	0.006
	No	63	4.33±2.85		
Did you sleep well at the first night after the surgery?	Yes	74	4.2±2.85	-4.14	0.0001
	No	47	6.45±2.98		
Did you have any other discomfort after the surgery?	Yes	6	5.5±2.43	0.34	0.731
	No	115	5.05±3.13		
How do you describe this surgery experience?	Better than expected	78	4.26±2.92	F:10.04 (ANOVA)	0.0001
	Like expected	34	6.21±3.02		
	Worse than expected	9	7.89±1.69		

Table 7. The distribution of edema with gender, age, position of the tooth, classification of the tooth, retention, angle, systemic conditions, bad habits, use of oral contraceptives and menstruation.

		Edema (-)		Edema (+)		
Gender	Male	7	28%	21	26.3%	$\chi^2:0.03$
	Female	18	72%	59	73.8%	$p=0.863$
Age	16-20 years old	9	36%	16	20%	
	21-30 years old	11	44%	52	65%	
	31-40 years old	2	8%	5	6.3%	$\chi^2:3.74$
	>41 years old	3	12%	7	8.8%	$p=0.290$
Position of the tooth	A	18	66.7%	39	41.5%	
	B	6	22.2%	43	45.7%	$\chi^2:5.73$
	C	3	11.1%	12	12.8%	$p=0.057$
Classification of the tooth	Class I	20	74.1%	35	37.2%	
	Class II	4	14.8%	46	48.9%	$\chi^2:12.2$
	Class III	3	11.1%	13	13.8%	$p=0.002$
Retention	Mucosa Retention	16	59.3%	26	27.7%	
	Partial bone Ret.	7	25.9%	54	57.4%	$\chi^2:10.1$
	Fully Bone Ret.	4	14.8%	14	14.9%	$p=0.006$
Angle	Horizontal	3	11.1%	24	25.5%	
	Mezioanguler	6	22.2%	24	25.5%	$\chi^2:3.29$
	Vertical	18	66.7%	46	48.9%	$p=0.193$
Systemic Conditions	No	19	70.4%	74	78.7%	$\chi^2:0.823$
	Yes	8	29.6%	20	21.3%	$p=0.364$
Bad habits	No	17	63.0%	65	69.1%	
	Smoking	9	33.3%	19	20.2%	
	Alcohol		0%	3	3.2%	$\chi^2:2.98$
	Smoking+Alcohol	1	3.7%	7	7.4%	$p=0.394$
Oral contraceptive use	Yes	1	5%	5	7%	$\chi^2:0.106$
	No	19	95%	66	93%	$p=0.745$
Menstruation	Yes	4	20%	9	12.7%	$\chi^2:0.684$
	No	16	80%	62	87.3%	$p=0.408$

In comparing edema with gender, age, position of the tooth, classification of the tooth, retention, angle, systemic conditions, bad habits, use of oral contraceptives and menstruation, statistically significant differences were observed between edema and classification of the tooth ($\chi^2:12.2$, $p=0.002$). Absence of edema in the class II patients

was noted in 4 patients (14.8%) and presence was noted in 46 (48.9%). These rates were in class I 20 (74.1%) and 35 (37.2%). More edema was observed in class II than in classes I and III. There was a statistically significant difference between edema and partial bony and complete bony impaction ($\chi^2:10.1$, $p=0.006$) (Table 7).

In comparing trismus with gender, age, position of the tooth, classification of the tooth, retention, angle, systemic conditions, bad habits, use of oral contraceptives and menstruation period, statistically significant differences were observed between trismus and partial bony impaction of tooth ($\chi^2:6.16$, $p=0.046$). The absence of trismus after the extraction of partial bony impacted tooth was 56 (49.6%), presence of edema was 5 (62.5%), while these means were 0 (0%) and 42 (37.2%) for trismus after the extraction of mucosal impacted teeth and 15 (13.3%) and 3 (37.5%) for trismus after the extraction of complete bony impacted teeth. In comparing the other data, no statistically significant differences were noted.

In comparing hemorrhage with gender, age, position of the tooth, classification of the tooth, retention, angle, systemic conditions, bad habits, use of oral contraceptives and menstruation, there weren't any statistically significant differences ($p>0.005$).

Discussion

Third molar operation is the most commonly performed surgical procedure (1). It is known that the mandibular third molar is the most impacted of the third molars, and therefore it's treatment usually requires a surgical intervention. The most commonly observed complications after an impacted mandibular third molar surgery are pain, edema, trismus, secondary hemorrhage, paresthesia and alveolitis. Infection, iatrogenic damage of the second molar and mandible fracture are rare complications (2). These complications after an impacted mandibular third molar surgery can lead to longer postoperative therapy and prolonged pain.

Age is a risk factor for postoperative complications occurring after the surgical

interventions. There is a distinctive association between age and observed postoperative complications. These associations result from the fact that the intervention in older patients lasts longer because of increased bone density. Age depended maturing of tooth root formation and decreased healing capacity lead to intensive postoperative complications (5). Some authors argue that there is no relationship between age and the complications like pain, edema and trismus (6). On the other hand, Bruce and Chiapasco et al. argue that older patients have more pain, edema and trismus as postoperative complications (5, 7). Charparro-Avendano et al. asserts that pain, edema and trismus are observed more in younger patients (8). In this study, there was no significant relationship between age and complications like pain, edema and trismus. This could result from the ages from the patients, which were between 21 and 30 years old.

Yuasa et al. argue that the intensity of postoperative edema depends on the gender (9). Monaco et al. reported that the incidence of postoperative edema in female patients (12.7%) is significantly higher than in male patients (1.4%) (10). In addition, Capuzzi et al. reported that male patients have more pain than female patients (11). In this study there were no significant findings for an association between gender and edema. The mean of visual analog scale (VAS) for pain was, in the male patients, 4.27 ± 2.86 , while it was 5.34 ± 3.13 in the female patients. There was no significant relationship noted between postoperative pain and gender. In addition, there was no significant association between trismus and gender ($p>0.005$).

It is thought that complications like pain, edema and trismus are caused by surgical trauma depending on the inflammatory process. In surgeries for impacted mandibu-

lar third molars, time of the intervention is thought to be associated with tooth position, angle and the experience of the surgeon and these parameters determine the difficulty of the surgery and are related to the intensity and time of pain, edema and trismus (5). Longer surgical interventions are thought to increase tissue damage and vascular permeability can cause postoperative edema and effect its intensity (12). In addition, it was reported that longer surgical interventions lead to increased surgical trauma, and therefore increased postoperative VAS scores (12, 13). The significance of the relationship between the angle of impacted mandibular third molar and trismus is also reported. Deep impacted third molar surgery needs a bigger flap design. Tissues in the neighborhood and muscles can receive more damage because of this wide and large access flap (13). Kim et al. reported that edema is significantly associated with the third molar depth and surgery time, and trismus complication (12). However, Pedersen argues that postoperative observed trismus is related to pain, and that patients therefore abstain from opening their mouths (14).

Operation time in patients with postoperative edema versus those without edema was reported as significantly high ($p=0.005$). Means of VAS of the patients with postoperative edema versus those without edema was also significant high (5.5 ± 3.06 , $p=0.004$). These findings show that increasing operation time leads to increased postoperative edema, and that pain and edema are related to each other (15). The reason for that could be longer operation time and increased tissue damage, as described in the literature. The fact that postoperative pain and trismus have no statistically significant relation to each other does not support the hypothesis that patients with postoperative pain avoid

opening their mouths. However, we observed significance between the existence of edema and trismus ($\chi^2:10.1$, $p=0.006$). According to the Pell-Gregory classification, there was a statistically significant difference between the existence of edema and classification relation ($\chi^2:12.2$, $p=0.002$). In class II more edema was observed than in classes I and III.

VAS is one of the most widely used methods to determine postoperative pain and edema (16). By this method, clinical data can be analyzed objectively and compared simply with other data (10). The assessment of pain with the VAS method is a subjective method and measured pain scores can vary in different individuals differently (16). Therefore, the filling out of the VAS scores was supervised by the same researcher.

Inadequate oral hygiene is related to increased bacterial plaque. Plaque in the surgical area and the existence of bacteria is reported to induce the physiopathology of postoperative pain and edema and increase chemical mediators and toxin production (17). Pernerrocha et al. noted a significant relationship between postoperative inadequate mouth hygiene and postoperative pain (18). In this study, the mouth hygiene was reported to be good in 64.46% of the patients, moderate in the 29.75% of them, and inadequate in 5.7% of them. In this study there was no significant association between mouth hygiene and complications like pain, edema and trismus noticed. It was thought that given orders and regular use of prescribed drugs induced less observed postoperative complications.

After the surgery of impacted mandibular third molars, the incidence of lingual nerve damage varies between 0.6% and 22%. Nerve damage can be temporary or permanent. Some authors argue that lingual nerve damage can occur during the use of the

lingual flap (19). On the other hand, Pogrel argues that using lingual flaps can prevent permanent lingual nerve damage (20). In this study, no nerve damage was noted. It can be assumed that not using a lingual flap in these surgical procedures did not result in any nerve damage complications.

It was reported that inferior alveolar nerve (IAN) damage incidences after surgery on impacted mandibular third molars varies between 0.3% and 8% (5, 21, 22). Radiolucent views of the impacted mandibular third molar root and the impossibility of following the radio opaque mandibular canal line in the radiography and/or the variations of the nerve canal are the risk factors for IAN damage (20, 23). Although permanent nerve damage is related to the impaction degree of the tooth, it was thought that postoperative IAN damage do not only occur because of the radiographic interpretation of the relationship between root and canal (24). In addition to the anatomical factors of the IAN damage, Kipp et al. reported that a direct view of the IAN can increase nerve incidence (23). Jerjes et al. also argued that the experience of the surgeon is related to IAN damage incidence (25). Although in the literature the influence of the operation time on the nerve damage isn't explained, some authors report that faster surgical interventions can also cause nerve damage (26). To et al. report that slow and careful interventions can prevent nerve damage (27). It is shown that IAN damage incidence occurs most commonly in the horizontal (2.8%) and distoangular (4%) positions of the teeth, but there is no statistical significance reported between the angulation of teeth and IAN damage (21). In this study we observed IAN damage in 10 patients 2 of them were male patients (7.1%), and 8 of them were female patients (10.8%). The most common IAN damage

was observed in patients with partial bony impacted third molars (60%). Paresthesia complications and position, classification and angulation of the impacted mandibular third molar were not observed to have any statistically significant relationship to each other. The reason for that can be that observed IAN damages were relatively few.

In this study, means of VAS of the patients with paresthesia versus patients without paresthesia were not significantly different. However, in the patients with paresthesia, the operation time was statistically significant in that it was longer than in the patients without paresthesia (41.2 ± 15.15 , $p=0.006$). The statistical significance between operation time and IAN damage supports the hypothesis of the study of Valmaseda-Castellon et al. (21). Longer operation time can be shown as a result of increased impaction degree of the tooth, and it was argued that IAN damage is related to the impaction degree of the tooth.

Although it is known that the age of the patient can be a risk factor for postoperative IAN damage, there are only a few studies that analyze the influence of age on IAN damage (5, 21, 22). The surgical intervention on impacted mandibular third molars in older patients resulted in more IAN damage in comparison with germectomy (5, 28). Kipp et al. argue that age has no influence on IAN damage (23). Queral-Godoy et al. report that the healing of the IAN damage in older patient is slower than in younger patients (29). More frequent and intense nerve damage in older patients can be explained by decreased nerve regeneration rates and decreased nerve elasticity. This hypothesis is supported by the studies, which researched the influence of age on peripheral nerve regeneration (30, 31).

In this study, IAN damages were observed in 1 patient between the ages of 16 and 20

years, in 6 patients between the ages of 21 and 30 years, in 1 patient between the ages of 31 and 40 years, and in 2 patients with an age of more than 41 years. Although there wasn't a statistical significance between age and IAN damage, IAN damage is most commonly observed in patients between the ages of 21 and 30 years. This finding can be explained because of the greater number of patients between these ages.

Alveolitis, caused by the fibrinolysis of the clot, is one of the most common complications after a mandibular third molar surgical extraction. The incidence of alveolitis after routine tooth extraction is between 1% and 3%, while the incidence of alveolitis after surgical extraction of the mandibular third molar is between 1% and 65% (32). The reasons for alveolitis are use of oral contraceptives, smoking, difficult extractions, experience of the surgeon and bacterial contamination (33-38). Although Eshghpour et al. reported that oral contraceptives can dramatically increase the risk of developing alveolitis (39). No alveolitis complications were observed in this study. It is believed that the inadequate number of patients, the abundance of the patients to the postoperative directives and medication led this result.

Postoperative infection occurring particularly after mandibular third molar extraction can easily spread into other anatomical spaces. Drainage and antibiotic therapy are the most effective treatment methods. Prophylactic antibiotic therapy is still being debated (40). Macgregor declare that prophylactic antibiotic therapy is unnecessary and complicates the treatment of secondary infections and writes prescriptions for antibiotics to reduce postoperative complications rather than prevent infection (41). Mitchell supports antibiotic use to prevent postoperative infections after the surgical extraction

of mandibular third molars (42). Osborn et al. (43) and Goldberg et al. (44) argue that antibiotic use is unnecessary for patients with a lower postoperative infection risk. In this study we observed infection in one patient and petechiae in one patient. Because of the lower incidence of infection, it was concluded that aseptic conditions were provided in the operation room and the patients abided by the postoperative directives and oral hygiene rules. But it should be remembered that the number of the patients was inadequate for this study.

After mandibular third molar tooth extraction, the resistance of the angular region decreases, and it is the most common region for mandible fractures. Trauma, excessive use of force and use of inappropriate tools can cause intraoperative fractures (45). The incidence of intraoperative and postoperative fracture of mandible changes between 0.0033% and 0.3% (46, 47). Also facial trauma and lesion associated to the tooth can also cause mandibular fracture (48). No fracture complications after mandibular third molar tooth extraction were observed in this study.

Lamping et al. argue that research made without the participation of patients is inadequate (49). Therefore, more participation by the patients is necessary for the studies to improve postoperative life quality. Thomson et al. notes the problems that patients have during the postoperative period with a standard survey (50). The previous survey studies showed that the incidence of symptoms like headache, nausea, dizziness and vomiting caused by postoperative pain and complications are between 45% and 92% (51, 52). In this study, survey questions prepared by Thomson et al. were used. The number of patients who felt "bad" (35.5%), the number of patients who had postoperative pain (68.6%) and the number of patients

who answered “Yes” to the question “Do you have any pain at the operation area?” (68.5%) are lower, and the number of patients who describe the medicaments given after the surgery as “effective” or “very effective” in this study is greater than in Thomson’s study. In total, 11.5% of the patients took medicaments other than those written on a prescription. The percentage of patients who answered “Yes” to the question “Did you have headache?” (28.1%) is statistically higher than the patients who answered “No” (71.9%). These results are compatible with the results of Thomson’s study.

Conclusion

In the postoperative period, a decrease in the quality of life dependent on the oral health of the patients can be observed. The postoperative findings related to the decrease of life quality are pain, edema, trismus and paresthesia. But in this study, the inadequate number of patients caused a lower complication incidence and less complication types to be observed at the clinic. Nonetheless, the information we had from the survey data and techniques shed light to postoperative complications and the changes and degradation in the quality of life after the third molar extraction.

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