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Original scientific paper

Assessing Health-Related Quality of Life Outcomes after the Surgical Removal of a Mandibular Third Molar

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A B S T R A C T

This study was designed to assess the impact of the surgical removal of a mandibular third molar on health-related quality of life (HRQoL) in the postoperative period. Data was obtained from 101 patients who had undergone 105 surgical procedures. Only one mandibular third molar was removed per visit. The inclusion criterion for surgical procedures was creating a mucoperiosteal flap either with or without osteotomy. Surgical details were noted in a pre-made questionnaire. A self-administered health-related quality of life questionnaire, designed for assessment of the patient's perception of recovery for pain, lifestyle and oral function, was given to all patients. Patients evaluated postoperative pain and other sequelae on a scale ranging from 0 (none) to 3 (severe). Follow-up visits were scheduled on the third and the seventh postoperative day, when wound healing was clinically evaluated and noted. At the review appointment, one week later, patients had their sutures removed and returned a completed follow-up questionnaire. Patients were contacted 14 days after surgery for the purpose of gathering additional data pertaining to their recovery. The mean score for pain had a peak value on day one (1.8), and showed an exponential decrease (1.2 on day three, 0.5 on day seven, 0.1 on day 14). All the other postoperative sequelae showed the same tendency to decrease exponentially. The type of operative procedure and tooth position showed significant impact on postoperative recovery. The surgical removal of a mandibular third molar causes severe deterioration in a patient's quality of life during the first 3 days postoperatively. The quality of life can be expected to return to a preoperative level by the end of the first postoperative week.

Key words: *third molar, pain assessment, oral surgical procedure, impacted tooth, wisdom tooth, postoperative period, Croatia*

Introduction

The surgical removal of the mandibular third molars is one of the most commonly performed dentoalveolar procedures in oral and maxillofacial surgery. Patients in the second and third decades of life who have retained third molars frequently seek treatment either because of clinical existing symptoms or to prevent such symptoms when recommended by dentists[1]. The surgical procedure can lead to postoperative complications and discomfort. Moreover, the removal of third molars is so common that the population morbidity of such minor complications may be significant[2–8]. This presumption makes the third molar issue a clinical problem of a special interest. While a great body of evidence exists about the possible signs and symptoms following third molar surgery in terms of pain, swelling, trismus and paresthesia, surprisingly little is known about the consequences of these on a patient's life, and how it affects their day to day life or life quality[9–14]. In the last three decades there has been a great increase in the use of health-related quality of life (HRQoL) questionnaires in medicine, but they have only recently been introducted in the field of oral surgery[10–11].

The aim of this study was to evaluate the patient's perception of pain and other postoperative sequelae after

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the surgical removal of a mandibular third molar, to determine the impact of the wisdom tooth position on the surgical outcome, as well as to percieve the impact of the two different surgical procedures on patient's quality of life.

Patients and Methods

Between November 2007 and May 2008 at the Department of Oral Surgery, School of Dental Medicine, University of Zagreb (Croatia) and in a private dental office in Split (Croatia), 101 consecutive patients who had undergone 105 surgical procedures of impacted mandibular third molars were included in this prospective case series study. Only 1 impacted mandibular third molar was removed per visit and all teeth were partially or completely covered with mucosa. Four female patients who needed bilateral extractions had their teeth removed on separate occasions. Raising a mucoperiosteal flap during the surgical procedure was the inclusion criterion for this study.

Participants were healthy individuals with no systemic diseases or history of treatment for psychiatric problems. Patients were not taking any medications in the preoperative period, except for the small percent of the female patients who regularly took oral contraceptives. Patients were given standard postoperative instructions: not to eat for 2 hours, to apply a cold compress to the extraction site extraorally, to hold the head in the upright position, a liquid diet for the first 12–24 hours, to avoid sunlight exposure, not to rinse their mouth immediately after surgery and to gently brush the teeth that were away from the extraction site. In cases of antibiotic prescription (n=30) a combination of amoxicillin and clavulanic acid was administered. A non-steroidal anti-inflammatory drug was prescribed for each patient (ibuprofen 400 mg – 3 times daily for 4 days). Informed written consent was obtained from all patients before they were included in this study. Ethics Committee of the School of Dental Medicine, University of Zagreb had approved this study.

All surgical details were noted in a pre-made questionnaire. The tooth position was defined by the Winter classification[2]. A self-administered health-related quality of life questionnaire, designed to assess a patient's perception of recovery for pain, oral function and lifestyle was given to all patients. The postoperative sequelae, such as pain, swelling, diet issues, halitosis, speaking and sleeping issues, were assigned a score on a scale ranging from 0 (absence) to 3 (severe). A patient's satisfaction with surgical outcome was also noted. Follow-up visits were scheduled on the third and the seventh postoperative day, when wound healing was clinically evaluated and noted. At the review appointment, one week after surgery, all patients had their sutures removed and returned a completed follow-up questionnaire. Patients were contacted at 14 days after the surgery for the purpose of gathering additional data pertaining to their recovery.

Descriptive statistics was performed for all of the assessed variables: frequencies (absolute frequency, relative frequency or ratios) were calculated for all of the categoric (nominal) variables, mean score and standard deviation were calculated for all of the ordinal variables. Correlations between preoperative or operative and postoperative variables were tested with the use of univariant methods of statistic analysis. In the case where both of the compared variables had been categoric, a χ^2-test was used. A Fisher's exact test was used in the case of low frequency of a certain variable. In the case where one of the variables of the analysis had been ordinal, a Wilcoxon rank-sum test was used. If the nominal variables had been assigned more than two values, a Kruskal-Wallis test was used. A value of $p<0.05$ was accepted as statistically significant. SAS© System software on a Windows XP platform was used for calculating statistics.

Results

One hundred and one patients (62 female, 39 male), representing 105 extraction sites of mandibular third molars, were entered into this study. The age group distribution is summarized in Table 1. There was 32.4% of patients with smoking habits. Thirteen point six percent of females regularly took oral contraceptives.

Reasons for surgical removal of the mandibular third molars were partial eruption in 21% of the cases, soft tissue impaction also in 21% of the cases and bony impaction in 58% of the cases, all of them in irregular third molar position in the lower jaw. Pericoronitis was noted in 26.7% of the cases. Surgical procedures included raising of the mucoperiosteal flap, either with or without osteotomy. In 66.7% of the cases a mucoperiosteal flap with osteotomy was performed, while in 33.3% of the cases no osteotomy was performed. Wisdom tooth positions were defined using the Winter classification: vertical position was noted to be the most common (31.4% of the cases), followed by mesioangular position in 30.5% of the cases, horizontal in 16.2% of the cases, distoangular in 12.4% of the cases, buccoangular in 4.8% of the cases, linguoangular in 3.8% of the cases and inverted in 1% of the cases. Surgical procedures were performed on the left side of the mandible in 56.2% of the cases and on the right side of the mandible in 43.8% of the cases. Twenty eight point six percent of the patients received antibiotic treatment in the perioperative period. Non-steroid anti-

TABLE 1
AGE GROUP DISTRIBUTION OF PARTICIPANTS

Variable	N	%
Age group		
13–18 years old	6	5,7
19–24 years old	43	41,0
25–30 years old	26	24,8
Above 30	30	28,6

-inflammatory drugs were prescribed to be taken in the postoperative period as required for pain relief in 75.2% of the cases.

Patients evaluated pain and other sequelae on a scale ranging from 0 (abscence) to 3 (severe). The mean score for pain had a peak value on first day (1.8), and showed an exponential decrease (1.2 on day 3, 0.5 on day 7, 0.1 on day 14) during the postoperative period (Figure 1). Furthermore, patients evaluated swelling (Figure 2), diet issues (Figure 3), halitosis (Figure 4), speaking (Figure 5) and sleeping issues (Figure 6), all of which showed an exponential decrease during the postoperative period. Symptoms regarding the tooth position and the surgical procedure are summarized in Tables 2 and 3.

Most of the participants (42.9%) in this study considered the second day after the surgery the most uncomfortable. Fourty percent of the participants found the first day to be the most uncomfortable, followed by the third day (14.3%), the fifth day (1.9%) and the fourth day (1%).

Lack of taste was noted in 22.9% of the cases during the first 7-day postoperative period, and in 4.8% of the cases in the second week following surgery. vAs for work-

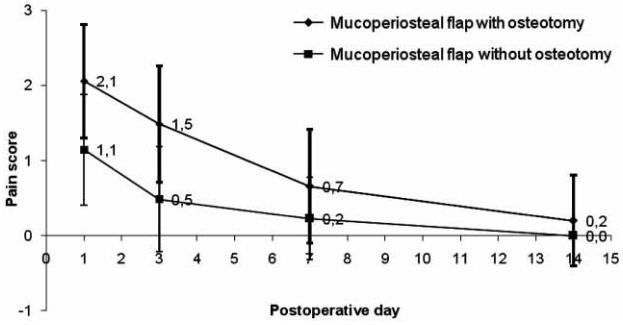

Fig. 1. The pain score comparison between the two types of surgical procedures.

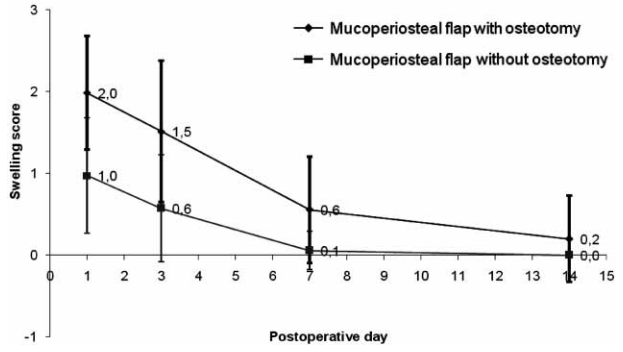

Fig. 2. The swelling score comparison between the two types of surgical procedures.

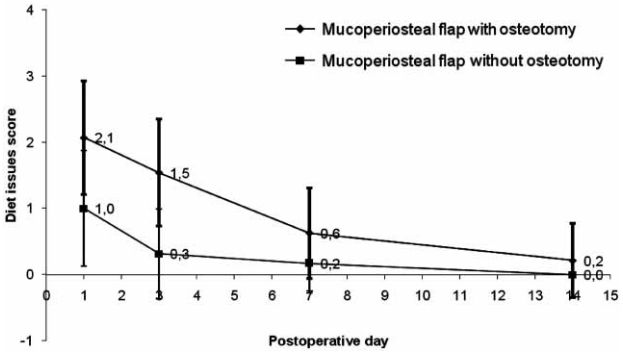

Fig. 3. The diet issues score comparison between the two types of surgical procedures.

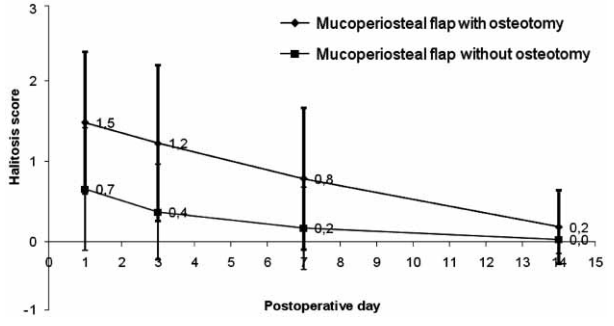

Fig. 4. The halitosis score comparison between the two types of surgical procedures.

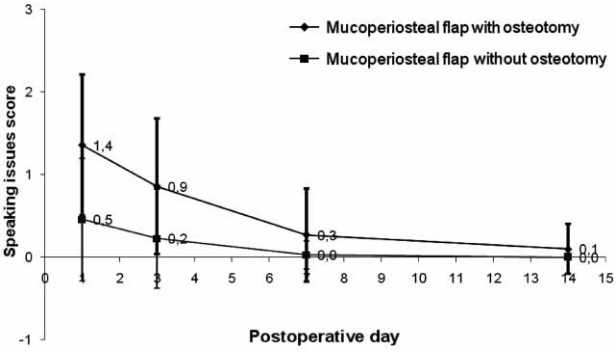

Fig. 5. The speaking issues score comparison between the two types of surgical procedures.

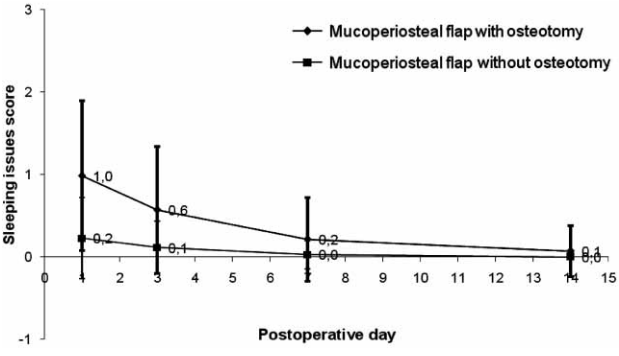

Fig. 6. The sleeping issues score comparison between the two types of surgical procedures.

TABLE 2
POSTOPERATIVE SEQUELAE REGARDING THE TOOTH POSITION

	vertical		mesioangular		Distoangular		horizontal		linguoangular		buccoangular		inverted		
Variable	mean	SD	mean	SD	mean	SD	mean	SD	mean	SD	mean	SD	mean	SD	p[1]
Pain															
1st postoperative day	1.4	0.8	1.8	0.8	1.92	1.04	2.00	0.79	2.25	0.50	1.60	0.55	3.00	.	0.06
3rd postoperative day	0.6	0.6	1.1	0.8	1.62	0.96	1.76	0.66	1.50	0.58	1.60	1.34	2.00	.	0.0000
7th postoperative day	0.3	0.6	0.6	0.7	0.69	0.63	0.71	0.92	0.50	1.00	0.80	0.84	0.00	.	0.20
14th postoperative day	0.0	0.0	0.0	0.2	0.23	0.44	0.29	0.77	0.00	0.00	1.00	1.41	0.00	.	0.010
Swelling															
1st postoperative day	1.1	0.9	1.9	0.7	2.15	0.90	1.82	0.53	2.25	0.50	1.40	0.55	2.00	.	0.0001
3rd postoperative day	0.6	0.7	1.3	0.8	1.62	0.96	1.53	0.94	2.00	0.82	1.20	1.10	3.00	.	0.0005
7th postoperative day	0.1	0.3	0.5	0.6	0.46	0.66	0.65	0.79	0.50	0.58	0.40	0.55	1.00	.	0.025
14th postoperative day	0.0	0.2	0.1	0.3	0.15	0.38	0.24	0.75	0.25	0.50	0.60	0.89	0.00	.	0.22
Diet issues															
1st postoperative day	1.0	0.8	1.8	1.0	2.31	0.75	2.12	0.78	2.50	0.58	1.80	1.10	2.00	.	0.0002
3rd postoperative day	0.5	0.8	1.3	1.0	1.46	1.05	1.65	0.79	1.75	0.50	1.20	0.84	2.00	.	0.0003
7th postoperative day	0.2	0.5	0.5	0.7	0.69	0.63	0.82	0.73	0.50	0.58	0.60	0.89	1.00	.	0.014
14th postoperative day	0.0	0.0	0.1	0.2	0.31	0.63	0.29	0.77	0.25	0.50	0.60	0.89	0.00	.	0.037
Halitosis															
1st postoperative day	0.9	0.9	1.4	1.0	1.46	0.88	1.12	0.78	1.75	0.96	1.20	0.84	3.00	.	0.10
3rd postoperative day	0.5	0.7	0.9	0.9	1.62	1.19	1.12	0.93	1.25	0.50	1.20	0.84	3.00	.	0.0036
7th postoperative day	0.2	0.5	0.6	0.9	0.85	0.90	1.00	0.94	0.75	0.50	1.00	1.22	1.00	.	0.0061
14th postoperative day	0.0	0.0	0.2	0.5	0.08	0.28	0.24	0.56	0.00	0.00	0.60	0.55	0.00	.	0.008
Speaking issues															
1st postoperative day	0.5	0.8	1.3	1.0	1.54	0.88	1.24	0.83	1.00	0.00	1.20	0.84	2.00	.	0.0043
3rd postoperative day	0.2	0.6	0.7	0.9	0.92	0.86	0.82	0.73	1.00	0.00	1.20	0.84	2.00	.	0.0029
7th postoperative day	0.0	0.2	0.1	0.3	0.23	0.44	0.53	0.87	0.25	0.50	0.20	0.45	1.00	.	0.019
14th postoperative day	0.0	0.0	0.0	0.2	0.23	0.44	0.06	0.24	0.25	0.50	0.20	0.45	0.00	.	0.06
Sleeping issues															
1st postoperative day	0.4	0.8	0.8	0.9	1.08	0.86	0.65	0.79	1.50	1.00	0.80	0.84	2.00	.	0.04
3rd postoperative day	0.1	0.3	0.4	0.8	0.85	0.80	0.47	0.62	0.50	1.00	0.60	0.89	2.00	.	0.013
7th postoperative day	0.1	0.2	0.3	0.6	0.15	0.38	0.12	0.33	0.00	0.00	0.40	0.89	0.00	.	0.71
14th postoperative day	0.0	0.0	0.0	0.2	0.08	0.28	0.00	0.00	0.00	0.00	0.60	0.89	0.00	.	0.00

[1] p – value for the Kruskal-Wallis test

day loss, 33.3% of the patients did not lose any working days, 15.2% lost 1 working day, 14.3% lost 2 working days, 14.3% lost 3 working days as well, 5.7% lost 4 days, 6.7% lost 5 days, 1% lost 6 days, 5.7% lost 7 days and 3.8% lost 8 days or more.

The suture removal was found uncomfortable by 2.9% of the patients. Almost all of the patients were satisfied with the surgical outcome (96.2%), while 86.7% of them would have agreed to repeat the procedure if necessary.

Postoperative complications occured in 34.3% of the participants of this study, most of which were healing complications (20%) and trismus (30.5%), followed by paresthesia (1.9%) and anesthesia (1%). The healing process was occasionally compromised by alveolar osteitis (12.4%), acute socket inflammation (5.7%) and acutely infected alveolus (1.9%).

The patient's age, gender, habits, and perioperative antibiotic treatment were not significantly correlated to the postoperative recovery. The type of operative procedure and the tooth position showed a significant impact ($p \leq 0,05$) on the postoperative recovery. The correlation between the third molar position in the lower jaw and the postoperative complications is shown in Table 4, as well as the correlation between the type of the performed surgical procedure and the postoperative complications. Patients experienced the least healing problems when their tooth had been in vertical position preoperatively – 43.5% of the patients who had no complaints were those with vertical position of the extracted tooth. Correlation

TABLE 3
POSTOPERATIVE SEQUELAE REGARDING THE SURGICAL PROCEDURE.

	Mucoperiosteal flap with osteotomy		Mucoperiosteal flap without osteotomy		
Variable	N	%	N	%	p[1]
Pain					
1st postoperative day					
Absent	1	1.4	5	14.3	0.0000
Mild	15	21.4	22	62.9	
Moderate	33	47.1	6	17.1	
Severe	21	30.0	2	5.7	
3rd postoperative day					
Absent	4	5.7	22	62.9	0.0000
Mild	36	51.4	9	25.7	
Moderate	22	31.4	4	11.4	
Severe	8	11.4	0	0.0	
7th postoperative day					
Absent	35	50.0	29	82.9	0.01
Mild	25	35.7	4	11.4	
Moderate	9	12.9	2	5.7	
Severe	1	1.4	0	0.0	
14th postoperative day					
Absent	61	87.1	35	100.0	0.17
Mild	6	8.6	0	0.0	
Moderate	1	1.4	0	0.0	
Severe	2	2.9	0	0.0	
Swelling					
1st postoperative day					
Absent	2	2.9	8	22.9	0.0000
Mild	11	15.7	21	60.0	
Moderate	43	61.4	5	14.3	
Severe	14	20.0	1	2.9	
3rd postoperative day					
Absent	7	10.0	18	51.4	0.0000
Mild	30	42.9	14	40.0	
Moderate	23	32.9	3	8.6	
Severe	10	14.3	0	0.0	
7th postoperative day					
Absent	37	52.9	33	94.3	0.0000
Mild	27	38.6	2	5.7	
Moderate	6	8.6	0	0.0	
Severe					
14th postoperative day					
Absent	59	84.3	35	100.0	0.043
Mild	9	12.9	0	0.0	
Moderate	1	1.4	0	0.0	
Severe	1	1.4	0	0.0	
Diet issues					
1st postoperative day					
Absent	2	2.9	11	31.4	0.0000
Mild	17	24.3	15	42.9	
Moderate	25	35.7	7	20.0	
Severe	26	37.1	2	5.7	
3rd postoperative day					
Absent	6	8.6	28	80.0	0.0000

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Mild	28	40.0	3	8.6	
Moderate	28	40.0	4	11.4	
Severe	8	11.4	0	0.0	
7th postoperative day					
Absent	34	48.6	30	85.7	0.0007
Mild	28	40.0	4	11.4	
Moderate	8	11.4	1	2.9	
Severe					
14th postoperative day					
Absent	59	84.3	35	100.0	0.07
Mild	8	11.4	0	0.0	
Moderate	2	2.9	0	0.0	
Severe	1	1.4	0	0.0	
Halitosis					
1st postoperative day					
Absent	8	11.4	17	48.6	0.0001
Mild	30	42.9	14	40.0	
Moderate	22	31.4	3	8.6	
Severe	10	14.3	1	2.9	
3rd postoperative day					
Absent	18	25.7	24	68.6	0.0001
Mild	26	37.1	9	25.7	
Moderate	18	25.7	2	5.7	
Severe	8	11.4	0	0.0	
7th postoperative day					
Absent	32	45.7	31	88.6	0.0001
Mild	25	35.7	2	5.7	
Moderate	9	12.9	2	5.7	
Severe	4	5.7	0	0.0	
14th postoperative day					
Absent	59	84.3	34	97.1	0.21
Mild	9	12.9	1	2.9	
Moderate	2	2.9	0	0.0	
Severe					
Speaking issues					
1st postoperative day					
Absent	9	12.9	24	68.6	0.0000
Mild	35	50.0	6	17.1	
Moderate	18	25.7	5	14.3	
Severe	8	11.4	0	0.0	
3rd postoperative day					
Absent	28	40.0	30	85.7	0.0000
Mild	25	35.7	2	5.7	
Moderate	16	22.9	3	8.6	
Severe	1	1.4	0	0.0	
7th postoperative day					
Absent	54	77.1	34	97.1	0.03
Mild	14	20.0	1	2.9	
Moderate	1	1.4	0	0.0	
Severe	1	1.4	0	0.0	
14th postoperative day					
Absent	63	90.0	35	100.0	0.092
Mild	7	10.0	0	0.0	
Moderate					

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Severe					
Sleeping issues					
1st postoperative day					
Absent	25	35.7	28	80.0	0.0001
Mild	25	35.7	6	17.1	
Moderate	16	22.9	1	2.9	
Severe	4	5.7	0	0.0	
3rd postoperative day					
Absent	41	58.6	31	88.6	0.005
Mild	19	27.1	4	11.4	
Moderate	9	12.9	0	0.0	
Severe	1	1.4	0	0.0	
7th postoperative day					
Absent	58	82.9	34	97.1	0.13
Mild	9	12.9	1	2.9	
Moderate	3	4.3	0	0.0	
Severe					
14th postoperative day					
Absent	66	94.3	35	100.0	0.70
Mild	3	4.3	0	0.0	
Moderate	1	1.4	0	0.0	
Severe					
Febrility					
1st postoperative day					
No	48	68.6	34	97.1	0.000
Yes	22	31.4	1	2.9	
3rd postoperative day					
No	62	88.6	35	100.0	0.05
Yes	8	11.4	0	0.0	
7th postoperative day					
No	70	100.0	35	100.0	1.000
Yes					
14th postoperative day					
No	68	97.1	35	100.0	0.55
Yes	2	2.9	0	0.0	
Working ability					
1st postoperative day					
No	51	72.9	3	8.6	0.0000
Yes	19	27.1	32	91.4	
3rd postoperative day					
No	30	42.9	1	2.9	0.0000
Yes	40	57.1	34	97.1	
7th postoperative day					
No	7	10.0	1	2.9	0.26
Yes	63	90.0	34	97.1	
14th postoperative day					
No	1	1.4	1	2.9	1.00
Yes	69	98.6	34	97.1	

[1] p – value for the Fischer's exact test

between vertical position of the third molar and postoperative healing problems was statistically significant (p=0.0002). Patients who experienced healing problems were in 8.3% of those cases with vertically positioned wisdom tooth. Horizontal position of the extracted tooth turned out to be the most inconvenient one – 33.3% of the patients who experienced healing problems were those with horizontally positioned wisdom tooth, while

TABLE 4
POSTOPERATIVE COMPLICATIONS REGARDING THE TOOTH POSITION AND THE SURGICAL PROCEDURE

	No complications noted		Complications noted			
Variable	N	%	N	%	p[1]	
Tooth position						
Vertical	30	43.5	3	8.3	0.0002	
Mesioangular	22	31.9	10	27.8		
Distoangular	7	10.1	6	16.7		
Horizontal	5	7.2	12	33.3		
Linguoangular	2	2.9	2	5.6		
Buccoangular	3	4.3	2	5.6		
Inverted	0	0.0	1	2.8		
Surgical procedure						
Mucoperiosteal flap with osteotomy	34	49.3	36	100.0	0.0000	[2]
Mucoperiosteal flap without osteotomy	35	50.7	0	0.0		

[1] p – value for the χ^2-test
[2] Fischer's exact test

being a minority amongst patients with no complaints (7.2%). The correlation between the surgical procedure that included raising of mucoperiosteal flap with osteotomy and postoperative discomfort was statistically sifnificant (p=0). Healing complications were noted only after the surgical procedures that included osteotomy.

There was a statistically significant correlation between the severity of postoperative sequelae and the surgical procedure as well as the tooth position. Postoperative sequelae were proven to be more severe after the surgical procedures that included osteotomy (Figure 1, p=0) and in cases where the tooth had been in a horizontal and liguoangular position (p<0.05)

Workday loss was significantly correlated to the surgical procedure (p<0.001, Wilcoxon rank-sum test) as well as to the wisdom tooth position (p=0.03, Wilcoxon rank--sum test). The correlation between wisdom tooth position and workday loss is shown in Table 5, as well as the correlation between performed surgical procedure and workday loss.

Discussion

The primary goal of this study was to evaluate the patient's perception of pain, swelling, diet issues, halitosis, speaking and sleeping issues after the surgical removal of a mandibular third molar, to determine the impact of the wisdom tooth position on the surgical outcome, as well as to percieve the impact of the two different surgical procedures on patient's health-related quality of life.

TABLE 5
WORKDAY LOSS REGARDING TO THE SURGICAL PROCEDURE AND THE TOOTH POSITION

	Workdays lost					
Variable	N	mean	SD	min.	max.	p[1]
Surgical procedure						
Mucoperiosteal flap with osteotomy	70	3.2	2.6	0	13	0.0000
Mucoperiosteal flap without osteotomy	35	0.4	0.8	0	4	
Tooth position						
Vertical	33	0.8	1.5	0	5	0.0001
Mesioangular	32	2.1	1.9	0	7	
Distoangular	13	2.6	2.2	0	7	
Horizontal	17	4.5	3.0	0	10	
Linguoangular	4	2.3	1.0	1	3	
Buccoangular	5	4.8	5.3	0	13	
Inverted	1	0.0	.	0	0	

[1] p – value for the Wilcoxon rank-sum test
[2] Kruskal-Wallis test

The following describes the outcomes of the study and how our findings might influence the outcome of previously published studies on this matter.

The mean scores for postoperative pain, swelling, diet issues, halitosis, speaking and sleeping issues after the surgical removal of a mandibular third molar showed a tendency to decrease exponentially in the 14-day postoperative period. A patient's age, gender, habits, and perioperative antibiotic treatment were not significantly correlated to the postoperative recovery. The type of operative procedure and the wisdom tooth position showed a significant impact on the postoperative recovery.

Gbotolorun et al[15] healing complications after third molar surgeries found in 14.2% of the cases, half of which were alveolar osteitis (dry socket). In our study healing complications were noted at a higher rate – in 20% of the cases: 12.4% of which were alveolar osteitis, 1.9% acute socket inflammation and 5.7% acute infection of the alveolus. In a study made by Grossi et al[3], there was no correlation between postoperative complications and gender, age and the use of oral contraceptives. In that study there was a statistically significant correlation between postoperative complications and the type of surgical procedure, smoking, surgeon's experience and the use of antibiotics. In our study there was no statistically significant difference in postoperative complications regarding gender, age, the use of oral contraceptives, smoking, surgeon's experience and the use of antibiotics. A statistically significant difference in postoperative complications was noted regarding the type of surgical procedure and the wisdom tooth position. Correlation between vertical position of the third molar and postoperative healing problems was statistically significant ($p=0.0002$). Correlation between surgical procedure that included raising of mucoperiosteal flap with osteotomy and postoperative discomfort was statistically sifnificant ($p=0$). Healing complications were noted only after the surgical procedures that included osteotomy. Results regarding gender, age and the use of oral contraceptives match those of Grossi et al., while the results regarding smoking, the use of antibiotics and surgeon experience greatly differ.

In a study made by White et al[16], most of the patients recovered in the first 5-day period after the surgery. The mean score for pain was the highest on day 1 and then showed a decrease over the following days. In our study, the mean score for pain also had the highest value on day 1 (1.8) and then showed an exponential decrease (1.2 on day 3, 0.5 on day 7, 0.1 on day 14). The other sequelae showed the same tendency to decrease exponentially.

In our study the patients whose surgical procedure included osteotomy had significantly higher values for pain than those whose surgical procedure did not include osteotomy. Hence, the greater the trauma, the more intensive the pain. There has been a significant correlation between the pain intensity and the tooth position. The horizontal and inverted positions were noted to be the most inconvenient. This seemed consistent since the surgical trauma during the removal of such teeth had been the greatest. However, this result differs for the result of a study made by Blondeau[17] et al. where mesioangular and distoangular positions showed the highest complication rate. Most of the participants (42.9%) in our study considered the second day after the surgery the most uncomfortable, 52.9% of which were those patients whose surgical procedure included osteotomy. Fourty percent of the participants found the first day to be the most uncomfortable, 71.4% of which were those patients whose surgical procedure did not include osteotomy.

Colorado-Bonnin et al[18] in their study have noted a lack of taste in 45% of the cases. Nerve cords of chorda tympani are situated lateral to the lingual nerve and are myelinated and very thin. Therefore, compression during the lower third molar surgery or postoperative swelling can lead to a lack of taste. The depth of wisdom tooth impaction was also found to be related to this phenomena[19]. In our study, 22.9% of the participants experienced a lack of taste during the first postoperative week and 4.8% of the participants experienced a lack of taste during the second postoperative week. This differs from the previously mentioned study.

In the other studies[20–23], the incidence of lingual nerve injury during the mandibular third molar removal varies from 0% to 23%, while the incidence of nerve injury to alveolar inferior nerve varies from 0.4% to 8.4%. The lingual nerve injuries are related to iatrogenic causes, such as irregular shape of the mucoperiosteal flap, faulty instrumentation and lingual plate perforation[24,25]. The injuries to the inferior alveolar nerve can be related to the tooth impaction depth[26], the lack of surgical experience[27], the use of burs during the bone removal[28] and the proximity of wisdom tooth roots to the mandibular canal[29,30]. In our study the incidence of nerve injury was within the parameters set by previously mentioned studies. The incidence of paresthesia was 1.9% and the incidence of anesthesia was 1%. The injuries were only affecting the lower alveolar nerve in all of the paresthesia and anesthesia cases mentioned.

In his study, Berge[30] has found an average loss of 1.07 working days per patient following the lower third molar surgery. In our study there has been an average loss of 3.2 working days for patients whose surgical procedure included osteotomy, and an average loss of 0.4 working days for patients whose surgical procedure did not include osteotomy. This comparison significantly differs when examining workday loss. A higher tissue trauma lead to a higher workday loss. Smokers tend to lose more working days as well as patients with lower third molars positioned buccoangular (4.8 days) and horizontal (4.5 days). Patients who experienced workday loss mostly lost 1 (15.2%), 2 (14.3%) or 3 (14.3%) working days.

In a study made by Colorado-Bonnin et al.[18], 51.6% of the patients found the suture removal unpleasant, 97.8% of the patients were satisfied with surgical outcomes, and 59.3% of patients would agree to repeat the procedure if necessary. Over half of the patients involved in the previously mentioned study considered their appearance to have deteriorated in the postoperative period. In our

study, the patients found the suture removal unpleasant at a much lesser level (2.9%), while the surgical outcome satisfaction matched the results of the previously mentioned study (96.2%). Most of the patients (86.7%) would agree to repeat the procedure if necessary, which greatly differs from the results of Colorado-Bonnin et al. Over the half of the patients (59.5%) participating in this study considered their appearance to have deteriorated in the postoperative period, which matches the results of the previously mentioned study.

Conclusion

The mean scores for postoperative pain and other sequelae after the surgical removal of a mandibular third molar showed a tendency to decrease exponentially in the 14-day postoperative period. A patient's age, gender, habits, and perioperative antibiotic treatment were not significantly correlated to the postoperative recovery. The type of operative procedure and the wisdom tooth position showed a significant impact on the postoperative recovery. The surgical removal of a mandibular third molar causes severe deterioration in a patient's quality of life during the first 3-day period after the surgery. The quality of life in the postoperative period can be expected to return to a preoperative level by the end of the first week after the surgery. A limitation of the present study is a relatively small sample size. Therefore, a further verification of the obtained data by a larger sample size study is necessary.

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PROCJENA KVALITETE ŽIVOTA PACIJENATA NAKON KIRURŠKOG UKLANJANJA DONJEG TREĆEG MOLARA

SAŽETAK

Kirurško uklanjanje donjeg trećeg molara jedan je od najčešćih dentoalveolarnih operativnih zahvata u oralnoj i maksilofacijalnoj kirurgiji. Cilj ovog istraživanja bio je procijeniti bol i ostale postoperativne tegobe nakon operativnog uklanjanja mandibularnog umnjaka te procijeniti povezanost pojedinih čimbenika vezanih uz operativni zahvat, pacijenta te njegove navike i ponašanje u postoperativnom razdoblju s nastankom boli i ostalih tegoba, kao i procijeniti

kvalitetu života u postoperativnom razdoblju. Uzorak se sastojao od 101 pacijenta kojima je operativnim zahvatom uklonjeno 105 mandibularnih umnjaka. Samo jedan mandibularni umnjak je uklonjen po zahvatu. Kriterij za sudjelovanje pacijenta u istraživanju obzirom na operativne zahvate bio je potrebno odizanje mukoperiostalnog režnja sa ili bez uklanjanja kosti. Svi detalji kirurškog zahvata bilježeni su u zasebnom upitniku. Svim sudionicima uručen je upitnik na osnovu kojeg su procjenjivali tegobe prvog, trećeg i sedmog postoperativnog dana te su bili telefonski kontaktirani četrnaestog postoperativnog dana. Postoperativni posjeti bili su zakazani na treći i sedmi postoperativni dan kada je vršena evaluacija cijeljenja rane, uz skidanje šavova sedmog dana. Bol je na ljestvici od 0 (odsutna) do 3 (intenzivna) imala najvišu srednju vrijednost prvog postoperativnog dana (1,8) te je zatim eksponencijalno padala (treći dan 1,2, sedmi dan 0,5, četrnaesti dan 0,1). Sve tegobe eksponencijalno su padale u postoperativnom periodu od 14 dana. Statistički značajna razlika u tijeku oporavka nađena je kod različitih kirurških tehnika te položaja zuba, dok za dob, spol, navike pacijenta i perioperativnu antibiotsku terapiju nije utvđena. Operativni zahvat uklanjanja donjeg molara značajno narušava kvalitetu života pacijenta u prva 3 postoperativna dana. Povrat kvalitete života na preoperativnu razinu može se očekivati po završetku prvog postoperativnog tjedna.