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Comparison of Two Different Flap Design on Impacted Mandibular Third Molar Surgery: A Split Mouth Randomized Clinical Study

Gömülü Mandibular Üçüncü Molar Cerrahisinde Kullanılan İki Farklı Flep Tasarımının Karşılaştırılması: Split Mouth Randomize Klinik Çalışma

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ABSTRACT Objective: Different mucoperiosteal flap designs are suggested throughout the extraction of the impacted lower third molar to decrease postoperative complications. The aim of the current study compare triangular flap and the envelope flap related to pain, trismus and edema on mandibular third molar extraction. **Material and Methods:** The present prospective split mouth study included 24 patients. Impacted third molar on one side of jaw was be extracted with a triangular flap, other side was be extracted with an envelope flap. In order to evaluate the edema and trismus, measurements were be made on the operation day, day 1, day 3 and day 7 with caliper. Patients marked on a 100 mm scale on the 1st, 3rd and 7th days after the operation to evaluate the pain and difficulty chewing in the postoperative period. **Results:** One of 24 patients were excluded from the study because vasovagal syncope developed during the procedure, and the study was completed with 23 patients. There was no statistically significant difference between the triangular and envelope flap groups in terms of edema and pain (p>0.05) (p>0.05). No statistically significant difference was found between 2 groups in terms of pain measurements and difficulty chewing on the 1st day, 3rd day, 7th days (p>0.05) (p>0.05). **Conclusion:** In conclusion, the current study observed that flap design had no effect on postoperative complications. According to the results of this study, flap design in the extraction of impacted wisdom teeth should be determined with the surgeon's preference.

Keywords: Impacted tooth; postoperative complications; morbidity

ÖZET Amaç: Postoperatif komplikasyonları azaltmak için gömülü alt üçüncü azı dişinin çekimi sırasında farklı mukoperiosteal flep tasarımları önerilmektedir. Bu çalışmanın amacı, mandibular üçüncü molar diş çekiminde ağrı, trismus ve ödem ile ilişkili triangular flep ile zarf flebinin karşılaştırılmasıdır. **Gereç ve Yöntemler:** Mevcut prospektif split-mouth çalışmaya 24 hasta dâhil edildi. Çenenin bir tarafındaki gömülü üçüncü molar dişi triangular flep ile diğer tarafı ise zarf flebiyle çekilmiştir. Ödem ve trismusun değerlendirilmesi amacıyla operasyon günü, 1. gün, 3. gün ve 7. günde cetvel ile ölçümler yapıldı. Ameliyat sonrası dönemdeki ağrı ve çiğneme güçlüğünü değerlendirmek için hastalar ameliyat sonrası 1, 3 ve 7. günlerde 100 mm'lik bir ölçekte işaretlendi. **Bulgular:** İşlem sırasında vazovagal senkop gelişmesi nedeniyle 24 hastadan 1'i çalışmadan çıkarıldı ve çalışma 23 hasta ile tamamlandı. Triangular flep ve zarf flep grupları arasında ödem ve ağrı açısından istatistiksel olarak anlamlı fark yoktu (p>0,05) (p>0,05). 1. gün, 3. gün ve 7. gün ağrı ölçümleri ve çiğneme güçlüğü açısından 2 grup arasında istatistiksel olarak anlamlı fark bulunamadı (p>0,05) (p>0,05). **Sonuç:** Sonuç olarak bu çalışmada, flep tasarımının postoperatif komplikasyonlar üzerinde hiçbir etkisinin olmadığı gözlemlendi. Bu çalışmanın sonuçlarına göre gömülü 20 yaş dişlerin çekiminde, flep tasarımı cerrahın tercihine göre belirlenmelidir.

Anahtar Kelimeler: Gömülü diş; postoperatif komplikasyonlar; morbidite

Mandibular third molar surgery can be considered as the most common procedure in dentolaveolar surgery and postoperative complications such as trismus, pain, edema and dry socket are frequently seen after surgery.[1] Following extraction of the third molar surgically, the severity of edema and degree of pain

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are the main determiner of postoperative patient ease.[2] Surgical methods and approaches in the third molar extraction are researched to minimize these complications.[3] Different mucoperiosteal flap designs are suggested throughout the extraction of the impacted third molar, but the most prevalent flap designs include the envelope flap and the triangular flap.[4] These flap techniques, which are widely described in the literature, are routinely used in third molar removal.[5,6]

The method of reflection the mucoperiosteal flap affects the complications and their frequency in the postoperative period in mandibular third molar extraction.[7] While some studies have reported more severe postoperative swelling with a vertical incision, however, some studies claimed that surgical flaps have no effect on edema formation.[8]

The aim of the current study compare triangular flap and the envelope flap related to pain, trismus and edema on mandibular third molar extraction. We hypothesized that there would be less edema and pain on impacted mandibular third molar extraction with envelope flap.

MATERIAL AND METHODS

SELECTION AND DESCRIPTION OF PARTICIPANTS

The split-mouth prospective study included 24 patients who scheduled in the Department of Oral and Maxillofacial Surgery Clinic of Ankara Yıldırım Beyazıt University at August 2023. The study was conducted under the guidance of the Consolidated Standards of Reporting Trials statement. The study was approved by Yıldırım Beyazıt University Clinical Research Ethical Committee (date: August 2, 2023; no: E-2023-36). Written informed consent was gotten approval from the subjects before starting the study, and patients were incorporated in the study according to the Declaration of Helsinki.

Patients were be randomly selected among the patients who met inclusion criteria of the study. Patients with any systemic disease and regular drug use were not included. The exclusion criteria were patients with pregnancy or lactating, presence of previous third molar extraction, presence of smoking, presence of acute inflammation, presence of pathology, refusal to join the study and presence of psychiatric disorder and drug treatment related to psychiatric disorder.

After examining the panoramic radiographs, the patients who will be undergone mandibular third molar extraction were included corresponding Class I or II and A or B positions on the authority of the Pell-Gregory classification, and the vertical or mesioangular position on the authority of Winter classification. The study comprised patients who have symmetric impacted lower third molars.

The type of mucoperiosteal flap type is considered as the determining variable and the outcome variables were measurement of interincisal distance, facial swelling, self-reported pain and difficulty of operation, among of analgesics used in the first postoperative week, and presence of alveolar osteitis.

Impacted third molar will be extracted respectively at intervals. The jaw side and flap method were determined for first extraction with lot by the nurse and the maxillofacial surgeon (Neda Hasanoğlu Erbaşar) who will perform the extraction was reported. The surgery was performed by the same surgeon (Neda Hasanoğlu Erbaşar) via a standard protocol. Impacted third molar on one side of jaw was be extracted with a triangular flap, other side was be extracted with an envelope flap. Patients were divided to 2 groups:

Group 1: Impacted tooth extraction by an envelope flap on one side of the patient.

Group 2: Impacted tooth extraction by an triangular flap on one side of the patient.

The time of surgery between incision and the end of the last suture were be recorded in the study. The interincisal distance (distance between the incisal edge of maxillary incisor and mandibular incisor teeth) was measured in milimeters with caliper to evaluate the trismus. In order to evaluate the edema, measurements were be made on the operation day, day 1, day 3 and day 7. Five line measurements, were be made among the determined points with caliper.[9,10]

- Distance from angle of mandible to labial commissura

- Distance from angle of mandible to nasal edge
- Distance from angle of mandible to lateral canthus
- Distance from tragus to labial commissura
- Distance from tragus to lateral canthus

Patients were asked to mark on a 100 mm scale on the 1st, 3rd, and 7th days following the surgery to evaluate the pain and difficulty chewing in the postoperative period. The total painkiller intake were be recorded by the patient from the end of the operation. After the operation, the patients were asked to evaluate the difficulty level of the operation with a 100 mm scale. It was recorded whether the patient have dry socket during the follow-up period. The maxillofacial surgeon (Kevser Sancak), who was blind in the study, made the measurements.

SURGICAL PROCEDURE

The impacted third molar surgery was carried out under local anesthesia (40 mg/mL articaine+6 mcg/mL adrenaline) with no sedation or premedication. A no.15 scalpel blade was used for incision and a full-thickness mucoperiosteal flap was raised. Bone removal and/or tooth sectioning were carried out under irrigation with sterile saline solution. The third molar was extracted and granulation tissue was removed. The alveolar cavity was irrigated with sterile saline solution and bleedding control was made. Lastly, mucoperiosteal flap was sutured by 3.0 silk sutures. Paracetamol were prescribed to use only when needed and patients were advised not to exceed the maximum 4 doses per day. 0.2% chlorhexidine mouth rinse after the next day was recommended to the patients. They were described to use an application of icepacking to the surgical area after surgery.

STATISTICS

IBM SPSS Statistics 21.0 (Armonk, NY: IBM Corp. IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0) were used for statistical analysis. Values with a statistical significance level of $p<0.05$ were considered significant. Power analysis with 90% power and a probability of <0.05 showed that this study should be performed with 24 patients. Number (n) and percentage (%) values were used to show the distribution of individuals in demographic information. Mean±standard deviation and median (interquartile width-interquartile range) values were given for the descriptive statistics of the variables.

Shapiro-Wilk test was applied to evaluate the normality distribution of variables in the study. In order to examine whether the parameters in the study differed in the measurement times (operation day, day 1, day 3, day 7), the analysis of variance in repeated measures (repeated measures analysis of variance) was used for the parameters with normal distribution, and the dependent sample Friedman's test was used for the parameters that did not show normal distribution. In paired comparisons, Bonferroni Correction was made and the analysis results were given.

If the parameters showed normal distribution, independent sample t-test was chosen. Otherwise Mann-Whitney U test was applied in order to compare the values of operation day, 1st, 3rd, and 7th days between triangular and envelope flap groups.

Cross tables were created for the comparison of alveolitis status between triangular and envelope flap groups and number (n), percent (%) and chi-square (c^2) test statistics were given.

RESULTS

One of 24 patients were excluded from the study because vasovagal syncope developed during the procedure, and the study was completed with 23 patients. It was determined that the mean age of the patients in the study was 22.57±4.04 years, the minimum age value was 18.0, and the maximum age value was 31.0. 52.2% (n=12) of the patients were female, 47.8% (n=11) were male. When their educational status is evaluated, 4.5% (n=1) of the individuals are secondary school graduates, 4.5% (n=1) associate degree, 36.4% (n=8) high school graduates, 54.6% (n=12) undergraduate degrees (Table 1).

According to 4 distance measurements, there was no significantly difference the Group 1 compared by the Group 2 related to the operation day, 1st day, 3rd day, 7th day ($p>0.05$). There were statistically significant difference according to 4 distance measure-

TABLE 1: Demographic characteristics of the study groups.

		Patients
Age (year)	X̄±SD	22.57±4.04
	Median (minimum-maximum)	22.0 (18.0-31.0)
Gender, n (%)		
Female		12 (52.2)
Male		11 (47.8)
Education, n (%)		
Secondary school		1 (4.5)
High school		8 (36.4)
Associate degree		1 (4.5)
Undergraduate degree		12 (54.6)

SD: Standard deviation.

ments between days for both groups (p<0.001). According to interincisal measurements, no statistically significant differences were observed in terms of the operation day, 1st day, 3rd day, 7th day (p>0.05). As statistical there were significantly difference between days on the interincisal mesurements for both groups (p<0.001) (Table 2).

In line with statistical analysis, there was no significantly difference between 2 groups related to pain measurements on the 1st day, 3rd day, 7th days (p>0.05). The mean pain score of individuals on the 1st day was 32.91±29.09, the mean on the 3rd day was 25.09±25.18, the mean on the 7th day was 9.55±16.43 for triangular flap group. It was determined that the mean pain score on the 1st day was 34.65±28.08, the mean score on the 3rd day was 23.91±26.26, the mean score on the 7th day was 9.13±13.22 for Group 1. According to the statistical results, no difference was observed between the three time-dependent measurements of pain measurement values (1st day, 3rd day, 7th day) in both groups (χ^2=27.877, p<0.001), (χ^2=19.375, p<0.001). As a statistical, no significant difference was found Group 1 compared by the Group 2 in terms of chewing difficulty measurements on the 1st, 3rd, and 7th days (p>0.05). There were statistically significant differences between the 3 time-dependent measurements of the chewing difficulty measurement values (1st day, 3rd day, 7th day) for both groups (χ^2=32.667, p<0.001), (χ^2=27.169, p<0.001) (Table 3).

According to statistical analysis, there was no difference envelope Group 1 compared by Group 2 in terms of the number of analgesics on the all days (from operation day to 6th day) (p>0.05). The number of analgesic usage of individuals in both groups decreased from the day of the operation to the 6th day (χ^2=42.668, p<0.001), (χ^2=31.606, p<0.001) (Table 4).

The average operation time of tooth extraction with the triangular flap method was 14.18±4.22, and the average of the operation time for tooth extraction with the envelope flap method was 14.04±4.47. There was no significant difference between the operation times according to the Group 1 and Group 2 (z=0.172, p=0.864). Besides, no statistically significant difference was found between the operational difficulty values for both groups (z=0.539, p=0.590) (Table 5).

After tooth extraction with the triangular flap method, dry socket was not observed in 82.6% (n=19), while dry socket was observed in 17.4% (n=4). It was determined that dry socket did not observe in 73.9% (n=17) of the extractions performed with the envelope flap method, dry socket was present in 26.1% (n=6) of the extractions. As a statistical, significant difference was not found in terms of alveolitis distribution according to flap method (c^2=0.511, p=0.475) (Table 6).

DISCUSSION

The aim of the current study assess the effect of the flap design used during the extraction of mandibular third molar on trismus, pain and edema. The hypothesis of the present study was rejected because there was no difference between the effect of the envelope flap and triangular flap on pain, trismus and edema. The planned split mouth study was performed with symmetrical teeth by the same surgeon to standardize the study.

Removal of third molar teeth is the most common surgical procedure. Complications such as bleeding, pain, edema, trismus, dry socket may develop after third molar tooth extraction.[2] Reducing or eliminating potential risk factors that cause postoperative morbidity after impacted third molar surgery have a significant medical and financial impact.[11] The type of incision and flap as the first step in impacted

TABLE 2: Comparison of edema and trismus parameters with triangular flap-envelope flapmethods on the basis of groups and times.

	Triangular flap		Envelope flap		
	X̄±SD	Median	X̄±SD	Median	p (group)
Distance between angle of mandible and labial commissura					
Operation day	8.91±0.61	8.90 (0.90)	8.79±0.51	8.70 (0.80)	t=0.707; p=0.483
1st day	9.86±0.79	9.90 (1.40)	9.85±0.65	9.90 (0.90)	t=0.081; p=0.936
3rd day	9.63±0.75	9.70 (1.00)	9.61±0.59	9.70 (1.10)	t=0.109; p=0.913
7th day	9.00±0.58	9.00 (0.90)	9.09±0.61	9.00 (1.20)	t=0.542; p=0.591
p (Time)	F=64.012; **p<0.001**		F=46.130; **p<0.001**		
Distance between angle of mandible and nasal border					
Operation day	11.30±0.71	11.20 (1.00)	11.13±0.62	11.10 (1.00)	t=0.838; p=0.406
1st day	12.09±0.71	12.10 (1.30)	11.89±0.59	11.90 (0.90)	t=1.032; p=0.308
3rd day	11.89±0.71	11.80 (1.00)	11.73±0.60	11.90 (0.70)	t=0.828; p=0.412
7th day	11.41±0.82	11.30 (1.20)	11.31±0.64	11.50 (0.90)	t=0.460; p=0.648
p (Time)	F=58.594; **p<0.001**		F=43.329; **p<0.001**		
Distance between angle of mandible and lateral canthus					
Operation day	11.37±0.84	11.40 (1.20)	11.26±0.65	11.20 (0.90)	t=0.512; p=0.611
1st day	11.99±0.83	12.00 (1.50)	11.79±0.68	12.00 (1.10)	t=0.930; p=0.358
3rd day	11.82±0.80	11.70 (1.50)	11.66±0.74	11.80 (0.90)	t=0.687; p=0.496
7th day	11.45±0.84	11.40 (1.20)	11.34±0.67	11.20 (0.80)	t=0.484; p=0.631
p (Time)	F=45.700; **p<0.001**		F=22.344; **p<0.001**		
Distance between tragus and labial commissura					
Operation day	11.53±0.66	11.60 (1.10)	11.31±0.67	11.40 (1.00)	t=1.150; p=0.256
1st day	11.93±0.61	12.10 (1.10)	11.75±0.65	12.00 (1.10)	t=0.977; p=0.334
3rd day	11.87±0.61	11.80 (1.00)	11.69±0.60	11.80 (1.00)	t=0.991; p=0.327
7th day	11.58±0.62	11.70 (1.00)	11.45±0.64	11.50 (1.20)	z=0.595; p=0.552
p (Time)	χ^2=55.151; **p<0.001**		χ^2=47.000; **p<0.001**		
Distance between tragus and lateral canthus					
Operation day	12.26±0.46	12.40 (0.60)	12.06±0.56	12.10 (0.80)	t=1.260; p=0.214
1st day	12.51±0.51	12.50 (0.50)	12.40±0.48	12.60 (0.70)	t=0.744; p=0.461
3rd day	12.41±0.46	12.60 (0.60)	12.32±0.50	12.50 (0.80)	z=0.597; p=0.551
7th day	12.27±0.45	12.40 (0.60)	12.10±0.56	12.10 (0.90)	t=1.130; p=0.265
p (Time)	χ^2=46.964; p<0.001		χ2=52.229; p<0.001		
Interincisal measurement					
Operation day	44.74±5.37	45.00 (8.00)	44.78±7.68	44.00 (10.00)	z=0.254; p=0.800
1st day	25.26±7.14	25.00 (9.00)	24.48±6.41	25.00 (10.00)	t=0.391; p=0.697
3rd day	29.48±6.79	29.00 (6.00)	27.96±5.99	29.00 (7.00)	t=0.805; p=0.425
7th day	38.78±5.64	40.00 (7.00)	35.77±6.03	36.50 (6.00)	t=1.730; p=0.091
p (Time)	χ^2=63.861; **p<0.001**		χ^2=61.055; **p<0.001**		

t: Independent sample t-test; z=Mann-Whitney U test statistic; F: Analysis of variance test statistic in repeated measures; χ^2: Friedman test statistic; SD: Standard deviation.

third molar extraction does not only affect the visibility and accessibility of the tooth, but also affect the complications in the postoperative period. Therefore, modifications have been developed in mucoperiosteal flap designs compromised by envelope flaps and triangular flaps to alleviate postoperative morbidity.[12]

Opinions on the effect of flap design used in third molar surgery on the postoperative period are controversial.[13] Vertical incision causes vascular disorder due to microleakage, and according to this information.[14] The study was designed that it was assumed that there would be more edema in the triangular flap. However in the current study no difference was found between 2 flap designs regarding edema. Xie et al. observed that less edema occurred when a vertical incision was not applied.[15] On the

TABLE 3: Comparison of pain and chewing difficulty parameters with triangular flap-envelope flap methods on the basis of groups and times.

	Triangular flap		Envelope flap		
	$\bar{X}$±SD	Median	$\bar{X}$±SD	Median	p (Group)
Pain					
Operation day	32.91±29.09	25.00 (42.00)	34.65±28.08	27.00 (46.00)	z=0.121; p=0.904
1st day	25.09±25.18	17.00 (32.00)	23.91±26.26	21.00 (25.00)	z=0.275; p=0.783
3rd day	9.55±16.43	3.00 (12.00)	9.13±13.22	3.00 (12.00)	z=0.185; p=0.853
7th day	χ^2=27.877; **p<0.001**		χ^2=19.375; **p<0.001**		
Chewing difficulty					
Operation day	48.61±30.67	45.00 (56.00)	44.04±31.17	47.00 (50.00)	z=0.747; p=0.455
1st day	35.22±29.30	24.00 (43.00)	29.70±25.89	21.00 (44.00)	z=0.605; p=0.545
3rd day	17.23±22.74	7.50 (27.00)	10.00±11.58	8.00 (11.00)	z=0.446; p=0.655
7th day	χ^2=32.667; **p<0.001**		χ^2=27.169; **p<0.001**		

z=Mann-Whitney U test statistic; χ^2: Friedman test statistic; SD: Standard deviation.

TABLE 4: Comparison of the number of painkiller use according to triangular flap-envelope flap methods on the basis of groups and times.

	Triangular flap		Envelope flap		
	$\bar{X}$±SD	Median	$\bar{X}$±SD	Median	p (Group)
Painkiller usage (analgesic)					
Operation day	2.14±0.99	2.00 (1.00)	2.02±1.01	2.00 (0.60)	z=0.883; p=0.377
1st day	2.00±1.23	2.00 (2.00)	2.23±1.07	2.00 (1.00)	z=0.567; p=0.571
2nd day	1.62±1.24	1.00 (1.50)	1.93±1.31	2.00 (1.00)	z=0.795; p=0.427
3rd day	1.22±1.06	1.00 (2.00)	1.33±1.45	1.00 (2.00)	z=0.100; p=0.938
4th day	1.18±1.01	1.00 (2.00)	1.33±1.14	2.00 (2.00)	z=0.416; p=0.708
5th day	0.88±0.88	1.00 (2.00)	1.06±0.97	1.00 (2.00)	z=0.515; p=0.631
6th day	0.81±0.75	1.00 (1.00)	0.94±0.85	1.00 (2.00)	z=0.402; p=0.724
p (Time)	χ^2=42.668; **p<0.001**		χ^2=31.606; **p<0.001**		

z=Mann-Whitney U test statistic; χ^2: Friedman test statistic; SD: Standard deviation.

TABLE 5: Comparison of operation time and operation difficulty values according to triangular flap-envelope flap methods.

	Triangular flap		Envelope flap		Test statistics	
	$\bar{X}$±SD	Median	$\bar{X}$±SD	Median	z	p value
Operation time	14.18±4.22	13.50 (7.00)	14.04±4.47	12.00 (6.00)	z=0.172	0.864
Operation difficulty	19.91±19.06	13.00 (29.00)	18.43±21.30	12.00 (22.00)	z=0.539	0.590

z=Mann-Whitney U test statistic; SD: Standard deviation.

TABLE 6: Comparison of the presence of dry socket according to the triangular flap-envelope flap method.

	Triangular n (%)	Envelope n (%)	χ^2	p value
Dry socket				
No	19 (82.6)	17 (73.9)	0.511	0.475
Yes	4 (17.4)	6 (26.1)		

χ^2: Chi-square test.

other hand, Dolanmaz et al. concluded that there was no difference in terms of edema when compared with the 2 flap methods, consistent with the results of this study.[2]

The this study reported no statistically significant difference in mouth opening the envelope flap compared by triangular flap. Kirk et al. found that tere were no difference in flap designs related to the severity of trismus in their study.[3] Suarez-Cunqueiro et al. reported that trismus values were not affected by flap design.[16] This results can be explained that the distal part of the incision line continues with same course in both flap designs.[4,7]

There is no definite aggrement on the effect of flap design on pain after surgery in the literature.[4] This study demonstrated that flap type had no effect on postoperative pain. Kirk et al. found that both flap designs had nearly the same pain scores.[3] Sandhu et al. stated that patients who underwent surgery with envelope flap had a higher pain score. However, Erdogan et al. suggested that the envelope flap group had lower pain scores.[7,17]

Dry socket owing to fibrinolysis of the clot is one of the most common complications after tooth extraction. While the incidence of dry socket is 2% after routine tooth extraction, it is more common (20%) after mandibular impacted third molar extraction.[11,18] The current study concluded that there was no difference in the incidence of dry socket between the 2 flap designs. In parallel with this study, Şimşek Kaya et al. reported that there was no relationship between dry socket and flap selection.[19] Kirk et al. reported that the incidence of dry socket was higher in the envelope flap group wheras they did not find a statistical difference.[3]

There was no difference related to the duration of surgery between groups in this study. This can be actually clarified that it takes longer to raise a mucoperiosteal flap for the envelope flap, while the suture takes longer time for the triangular flap.

Many different techniques are used to assess postoperative swelling, including visual measurement, survey, interspot measurement, and magnetic resonance imaging. Although magnetic resonance imaging is the most objective and reproducible evaluation tool, other methods can be used due to its high cost.[8,20,21] In this study, measurement with ruler and visual analogue scale were preferred due to high cost and ease of use.

There were some limitations in this study. First limitation of this study is that the periodontal condition of the second molar tooth and wound healing were not evaluated. Secondly, an measurement of the patients' quality of life after surgery could be evaluated. Lastly, the use of a 2-dimensional measurement method to measure edema can be counted. Postoperative 3-dimensional evaluation could reveal more objective measurements of soft tissue changes. Besides, randomized studies with larger group of patients are needed in future studies.

CONCLUSION

In conclusion, the current study observed that flap design had no effect on postoperative complications. According to the results of this study, flap design in the extraction of impacted wisdom teeth should be determined with the surgeon's preference on a case-by-case basis. Comparative studies with larger sample groups related to flap design should be conducted to develop methods and approaches that affect postoperative complications.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Güzide Neda Hasanoğlu Erbaşar;* ***Design:*** *Güzide Neda Hasanoğlu Erbaşar, Halil Anlar;* ***Control/Supervision:*** *Halil Anlar;* ***Data Collection and/or Processing:*** *Kevser Sancak, Güzide Neda Hasanoğlu Erbaşar;* ***Analysis and/or Interpretation:*** *Kevser Sancak;* ***Literature Review:*** *Halil Anlar, Kevser Sancak;* ***Writing the Article:*** *Kevser Sancak;* ***Critical Review:*** *Güzide Neda Hasanoğlu Erbaşar;* ***References and Fundings:*** *Halil Anlar;* ***Materials:*** *Kevser Sancak, Güzide Neda Hasanoğlu Erbaşar.*

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