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Effectiveness of Fan-Shaped Buccal Kinesio Taping in Third Molar Surgery: A Split-Mouth Randomized Controlled Trial

Üçüncü Azı Dişi Ameliyatında Yelpaze Şeklinde Bukkal Kinesio Bantlamanın Etkinliği: Bölünmüş Ağız Rastgele Kontrollü Çalışma

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ABSTRACT

Objective: Kinesio taping (KT) has been proposed as an adjunct to standard care for managing postoperative complications following impacted mandibular third molar surgery. This study aimed to evaluate the effectiveness of KT in improving postoperative outcomes.
Methods: This prospective, split-mouth, controlled clinical study included 25 healthy adults (18–35 years) requiring bilateral mandibular third molar removal, with surgeries performed at least four weeks apart. The experimental group received KT postoperatively, applied fan-shaped to the buccal region for five days, while the control group received standard care. Swelling, pain, and trismus were measured preoperatively and on postoperative days 2 and 7, while bleeding was assessed on day 1.
Results: Swelling peaked on day 2 and subsided by day 7 in both groups, with no significant differences (*P*>.05). Pain decreased over time without statistical significance (*P*>.05). Trismus recovery was slower in the KT group but not significant. Bleeding scores were similar (*P*=.61). Additionally, 56% found KT impractical, and 8% reported significant discomfort.
Conclusion: KT did not provide statistically significant benefits in reducing postoperative complications compared to standard care. While KT is safe and well-tolerated, its clinical utility remains limited. Further research is necessary to refine application techniques and assess their broader clinical impact.
Keywords: Impacted tooth, kinesio tape, oral surgery, pain management, postoperative swelling

ÖZ
Amaç: Kinezyo bantlama (KT), gömülü mandibular üçüncü molar diş çekimi sonrası gelişebilecek postoperatif komplikasyonların yönetiminde standart bakıma ek olarak önerilmiştir. Bu çalışmanın amacı, KT'nin postoperatif sonuçları iyileştirmedeki etkinliğini değerlendirmektir.
Yöntemler: Bu prospektif, split-mouth, kontrollü klinik çalışmaya, bilateral mandibular üçüncü molar diş çekimi gereken ve işlemleri en az dört hafta arayla yapılan, 18–35 yaş aralığında 25 sağlıklı yetişkin dahil edilmiştir. Deney grubuna operasyon sonrası, yanak bölgesine yelpaze şeklinde uygulanmak üzere beş gün boyunca KT uygulanmış, kontrol grubuna ise yalnızca standart bakım verilmiştir. Şişlik, ağrı ve trismus ameliyat öncesi ve ameliyat sonrası 2. ve 7. günlerde değerlendirilmiş; kanama ise 1. günde ölçülmüştür.
Bulgular: Her iki grupta da şişlik 2. günde en yüksek seviyeye ulaşmış ve 7. günde azalmıştır; gruplar arasında anlamlı fark gözlenmemiştir (*P*>,05). Ağrı zamanla azalmış ancak istatistiksel olarak anlamlı bulunmamıştır (*P*>,05). Trismus KT grubunda daha yavaş iyileşmiş olsa da fark anlamlı değildir. Kanama skorları benzerdir (*P*=,61). Ayrıca, katılımcıların %56'sı KT'yi kullanışsız bulurken, %8'i ciddi rahatsızlık bildirmiştir.
Sonuç: KT, standart bakıma kıyasla postoperatif komplikasyonları azaltmada istatistiksel olarak anlamlı bir fayda sağlamamıştır, güvenli ve tolere edilebilir bir yöntem olmakla birlikte, klinik kullanım alanı sınırlı kalmaktadır. Uygulama tekniklerinin geliştirilmesi ve klinik etkinliğin daha kapsamlı değerlendirilmesi için ileri çalışmalara ihtiyaç vardır.
Anahtar Kelimeler: Gömülü diş, kinezyo bant, ağız cerrahisi, ağrı yönetimi, postoperatif şişlik

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INTRODUCTION

Impacted teeth are defined as teeth that fail to erupt into their proper occlusal position due to obstruction by bone and/or soft tissue. The surgical removal of impacted teeth is among the most frequently performed procedures in oral and maxillofacial surgery clinics.[1,2] Among impacted teeth, third

molars have the highest incidence of impaction, with reported intraoperative and postoperative complication rates ranging from 4.6% to 30.9%.[3,4] The most common postoperative complications include pain, swelling, and trismus, which can negatively affect the patient's quality of life and prolong recovery. Various strategies, including pharmacological interventions and surgical modifications, have been implemented to mitigate these complications.[5]

Kinesio taping (KT) was developed by Dr. Kenzo Kase in 1973 as a non-invasive therapeutic approach to enhance musculoskeletal function and promote tissue recovery.[6] KT is believed to facilitate lymphatic and blood circulation, modulate pain, and improve tissue function by adhering to the skin and influencing underlying structures.[6] While the application technique varies depending on the target area and desired effect, most studies have employed a vertical KT method extending from the clavicle to the masseter muscle.[7]

In contrast to previous studies, our approach focuses on a fan-shaped, horizontally oriented KT application directly targeting the masseter muscle, categorized under muscle application techniques. This method has been primarily used in temporomandibular disorder (TMD) rehabilitation, where it is believed to act through neuromuscular mechanisms such as modulating muscle tone, relieving tension, and stimulating cutaneous mechanoreceptors. The primary objective of this study is to evaluate the efficacy of extraoral KT in reducing postoperative pain, swelling, and trismus following mandibular third molar surgery.

METHODS

Study Design and Setting

This study was designed as a prospective, split-mouth, randomized controlled clinical trial conducted at Ondokuz Mayıs University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, between May 2022 and September 2022. The study was approved by the Turkish Ministry of Health, Turkey Pharmaceuticals and Medical Devices Agency (Decision No: E-68869993-511.06-757804) and Ondokuz Mayıs University Clinical Research Ethics Committee (Date: December 29, 2021, Decision No: 2021/686), and it adhered to the principles outlined in the Helsinki Declaration.

All participants received detailed information regarding the study's purpose, duration, procedures, expected responsibilities, potential risks, and complications. Written informed consent was obtained from all patients before their enrollment. To maintain surgical standardization, all procedures were performed by a single experienced oral and maxillofacial surgeon using identical surgical protocols. A split-mouth study design was chosen to minimize inter-patient variability and potential biases by enabling intra-patient comparisons.

Sample Size and Participant Selection

The study included 25 patients with bilaterally impacted mandibular third molars. Sample size determination was based on a power analysis, considering a 90% confidence level and a 5% margin of error. Based on the analysis, a minimum of 50 impacted third molars was required, with 25 teeth in the KT group and 25 teeth in the control group.

Patients were selected through purposive sampling, ensuring that only those who met the eligibility criteria and voluntarily agreed to participate were included.

Inclusion and Exclusion Criteria

Inclusion Criteria: Healthy adults between the ages of 18 and 35, with bilaterally impacted mandibular third molars requiring surgical removal, and without any systemic diseases or contraindications to surgery were included in the study.

Exclusion Criteria: Patients who were pregnant or breastfeeding, had a recent history of steroid or anticoagulant therapy, or reported an allergy to tape adhesives were excluded from the study.

Trial Setting and Data Collection

All patient data, including demographic characteristics, clinical history, and preoperative radiographic evaluations, were collected at the same institution. Preoperative assessments included a detailed medical and dental history, clinical examinations, and radiological imaging using orthopantomography (OPG). Only patients with bilaterally symmetrical, fully or partially impacted mandibular third molars in a horizontal position were included in the study.

Each patient underwent two separate surgical sessions, with a minimum interval of four weeks between procedures to ensure adequate healing and standardization of physiological conditions. To enhance KT adhesion, male patients were advised to shave on the morning of surgery and before follow-up appointments.

Surgical Sequence Allocation

This study followed a split-mouth design, in which each patient served as their own control. The sequence of surgical sides (right or left first) was determined entirely by patient preference, before any surgical intervention and without investigator influence, although this may still introduce bias. The contralateral side was operated on in a second session with a minimum interval of four weeks to allow for healing and standardization. The KT intervention was consistently applied after the second surgery for all participants. As each patient underwent both conditions (KT and no KT), randomization in the traditional sense was not performed; however, this design ensured that all participants experienced both the experimental and control conditions under comparable circumstances, thereby minimizing inter-patient variability.

Blinding was not feasible for patients or the surgeon due to the nature of the intervention. However, outcome assessors and data analysts remained unaware of the treatment assignments to reduce potential bias in postoperative evaluations.

Surgical Procedure

The same experienced surgeon conducted all surgeries under identical conditions, adhering to strict surgical and sterilization protocols. The order of the surgical side (right or left first) was determined based on patient preference.

Surgical Protocol

For inferior alveolar, lingual, and buccal nerve blocks, local anesthesia was administered using 40 mg/ml articaine HCl and 0.012 mg/ml epinephrine HCl (Ultracain DS forte, Sanofi-Aventis, Germany). No more than two ampoules were used unless necessary to minimize postoperative swelling. A triangular mucoperiosteal flap was created with a horizontal incision extending to the retromolar area and a vertical incision mesial to the second molar using a No. 15 scalpel blade (Beybi, No. 15, Turkey). Bone removal was performed using carbide burs (Meisinger XHM 244, Germany) at 40,000 rpm with a drill mounted on a handpiece, under continuous 0.9% saline irrigation. After bone was removed from the occlusal and buccal areas, an access point was created for elevator insertion. The crown and roots were sectioned and extracted with a Bein elevator. The socket was cleaned with a surgical curette and irrigated with 20 cc of saline. The flap was repositioned, and primary closure was achieved with 3/0 silk sutures (Doğsan®, Türkiye). The sutures were removed on the 7th postoperative day. Postoperatively, all patients were prescribed antibiotics (Amoxicillin-

Clavulanic Acid, Augmentin-BID® 1000 mg, GSK, Türkiye) to be taken twice daily for five days to prevent infection. Additionally, patients were instructed to use an oral rinse containing Benzydamine HCL and Chlorhexidine Gluconate (Kloroben® 200 ml, Drogsan, Türkiye) three times daily for five days and an analgesic (Dexketoprofen, Arveles® 25 mg, MENARİNİ, Türkiye) twice daily for pain relief. Detailed postoperative care instructions were provided verbally and in written form. Patients were advised not to exceed two doses of painkillers per day unless essential and were instructed to record the date and time of any additional analgesic intake. Cold compress was avoided due to inconsistent findings regarding its effect on postoperative swelling. Following the surgery, KT application was performed as part of the study protocol.

KT Application Protocol

The patients were seated upright for the application of KT. In this study, KINESIO-TEX GOLD® (5 cm x 5 m) tape was used in a fan-shaped design. The tape was cut into three strips, each approximately 1.5 cm wide, and applied to the buccal region, specifically targeting the area anticipated to experience the most swelling. The tape was rounded at the edges to prevent peeling and applied with 30% tension while the muscle was stretched. (Figure 1) After application, the tape was gently rubbed to improve adhesion, ensuring proper placement by observing skin folds. Patients were instructed on tape care and informed that the tape could withstand water exposure. The tape was left in place for five days without replacement. No tape was applied to the control side. All applications were performed by the same oral and maxillofacial surgeon to ensure consistency. The application protocol was determined in consultation with a physiotherapist, with the deliberate aim of evaluating potential neuromuscular mechanisms rather than the extensively studied lymphatic drainage approaches.

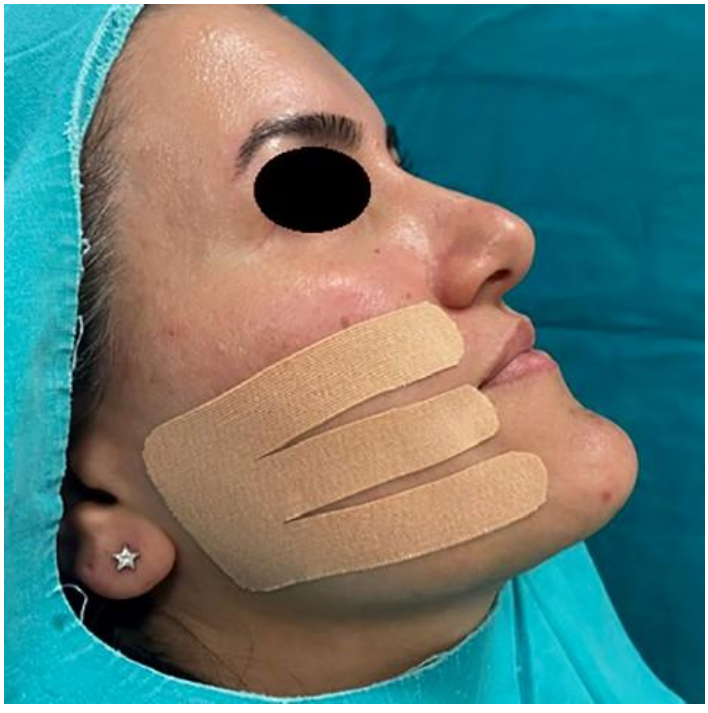

Figure 1. Postoperative kinesio taping application on the buccal region.

Outcome Measures

Postoperative evaluations were conducted for both groups. Patients were asked to complete a questionnaire assessing their postoperative experience. The questionnaire included questions about which side felt more comfortable (taped or non-taped), whether they required additional analgesics, if the tape caused any discomfort, whether the tape restricted their movements, and whether they found the tape practical to use. Demographic variables such as age, sex, and smoking status were recorded.

Pain

Pain was assessed using a Visual Analog Scale (VAS). The scale ranges from 0 (no pain) to 10 (unbearable pain). Patients were instructed to mark the average level of pain they experienced on the day of surgery, as well as on postoperative days 2, 3, and 7. They were also asked to bring the completed forms with them during their 7th-day follow-up appointment for evaluation.

Swelling

Postoperative swelling was evaluated by measuring the distances between predefined anatomical reference points: Tragus-to-Lip Commissure (Figure 2), Tragus-to-Pogonion (Figure 3), and Eye-to-Mandibular Angle (Figure 4). Measurements were performed using a flexible ruler to assess soft tissue contours accurately.

Assessments were conducted preoperatively, on the 2nd postoperative day, and on the 7th postoperative day, following the methodologies described by Mojsa et al.[8] and Orozco-Solís et al.[9]

Trismus

The effect of the taping technique on postoperative trismus was evaluated by measuring the interincisal distance between the incisal edges of the upper and lower central incisors. Measurements were taken preoperatively, as well as on postoperative days 2 and 7, using a ruler.

Bleeding

Bleeding was evaluated using a numerical rating scale ranging from 0 (no bleeding) to 10 (severe bleeding). Postoperatively, patients were given bleeding assessment forms containing the numerical scale and instructed to record their observations.

Figure 2. Linear measurement from the tragus to the labial commissure.

Figure 3. Linear measurement from the tragus to the pogonion.

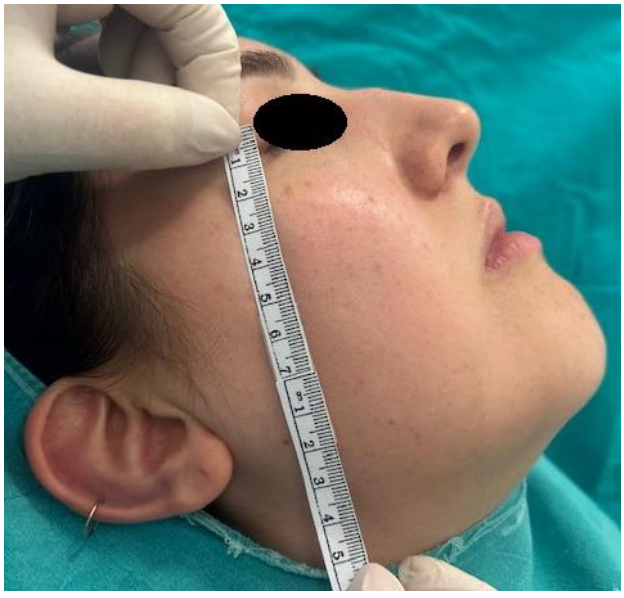

Figure 4. Linear measurement from the lateral canthus to the mandibular angle

Statistical Analysis

Statistical analysis was performed using SPSS 22.0 software (IBM SPSS Corp., Armonk, NY, USA). Descriptive statistics, including mean (M), standard deviation (SD), skewness (S), and kurtosis (K), were calculated to assess data distribution and variability. Normality was evaluated using the Shapiro-Wilk test due to the sample size (N = 25 per group). Skewness and kurtosis values, along with the Shapiro-Wilk results, indicated that the data did not meet the assumption of normality (*P*<.05). Therefore, nonparametric tests were employed for further analysis. The Mann-Whitney U test was used to compare the experimental and control groups at each time point for swelling, mouth opening, pain, and bleeding. Additionally, Wilcoxon Signed-Rank tests were conducted to analyze postoperative trends within each group for swelling and maximum mouth opening (MMO) measurements over time. Effect sizes (r) were calculated to determine the magnitude of differences, with values of 0.1, 0.3, and 0.5 interpreted as small, medium, and large effects, respectively. The level of **statistical significance was set at P<.05.**

RESULTS

Demographic Findings

All 25 patients completed both surgical sessions without any dropouts. The mean age of the participants was 21.39 years (range: 19–29). Of the total sample, 68% were female (n = 17) and 32% were male (n = 8).

Primary Outcomes

The primary outcomes included swelling, MMO, pain, and bleeding.

Normality of the data was assessed using the Shapiro-Wilk test, and none of the variables met the assumption of normality. Therefore, non-parametric statistical analyses were performed. The Mann-Whitney U test was used for between-group comparisons, and the Wilcoxon signed-rank test was employed for within-group analyses.

MMO decreased on postoperative day 2 and improved by day 7 in both groups. Although the KT group showed slightly slower recovery, there were no statistically significant between-group differences at any time point (*P*>.05). Detailed data are available in Tables 1 and 2.

Table 1. Descriptive statistics for swelling and MMO based on reference points

Measurement	Group	Time	M	SD	S	K
Tragus-Lip Corner	Control	Preoperative	11.26	0.63	0.43	2.24
		2nd Day	11.61	0.66	0.05	1.87
		7th Day	11.26	0.63	0.33	2.19
	Study Group	Preoperative	11.24	0.63	0.33	2.19
		2nd Day	11.84	0.69	0.45	2.16
		7th Day	11.26	0.63	0.33	2.19
Tragus-Pogonion	Control	Preoperative	14.48	0.81	0.37	2.32
		2nd Day	15.12	0.94	0.38	2.31
		7th Day	14.50	0.80	0.31	2.35
	Study Group	Preoperative	14.44	1.07	-1.16	5.35
		2nd Day	15.04	0.98	-0.18	2.14
		7th Day	14.58	0.80	0.05	2.32
Eye-Mandibular Corner	Control	Preoperative	10.57	0.57	0.06	1.86
		2nd Day	10.95	0.52	0.13	2.00
		7th Day	10.57	0.57	0.06	1.86
	Study Group	Preoperative	10.56	0.60	0.21	1.83
		2nd Day	10.87	0.59	-0.11	1.96
		7th Day	10.52	0.55	0.11	1.91
MMO	Control	Preoperative	4.31	0.36	-0.02	2.61
		2nd Day	2.91	0.95	0.50	2.54
		7th Day	4.86	0.73	-0.05	2.02
	Study Group	Preoperative	4.30	0.41	0.38	2.31
		2nd Day	3.06	0.83	0.13	3.00
		7th Day	3.98	0.64	-0.79	3.50

Note: Descriptive statistics, including Mean (M), Standard Deviation (SD), Skewness (S), and Kurtosis (K), are presented for swelling and maximum mouth opening (MMO) measurements. Measurements were taken in centimeters (cm). Increased distances between reference points indicate increased swelling, while MMO changes reflect functional limitations. Normality was assessed using the Shapiro-Wilk Test, and the results indicated non-normal distributions. Therefore, nonparametric tests were employed for further analysis.

Swelling, measured in centimeters using three anatomical reference points (tragus–lip commissure, tragus–pogonion, and eye–mandibular angle), peaked on postoperative day 2 and declined by day 7 in both groups. No statistically significant differences were found between the KT and control groups at any time point (*P*>.05). Descriptive statistics for swelling measurements are provided in Table 1, and Mann-Whitney U test results are detailed in Table 2.

Pain levels, evaluated using a visual analog scale (VAS), showed a consistent decrease from postoperative day 1 to day 7 in both groups.

The KT group exhibited slightly higher initial scores, but no significant differences were observed at any time point (*P*>.05). Descriptive and comparative statistics are shown in Tables 3 and 4.

Bleeding, assessed on postoperative day 1, was marginally higher in the KT group. However, the difference between groups was not statistically significant (*P*=.61). Relevant data are presented in Tables 3 and 4.

Table 2. Statistical data of for swelling and MMO measurements based on Mann-Whitney U test results

Variable	Time	Group	N	Mean Rank	Sum of Ranks	W	Median	*P*	r
Tragus-Lip Corner	Preoperative	Study Group	25	25.76	644.00	319.00	11.50	.90	0.02
		Control	25	25.24	631.00		11.00		
	2nd Day	Study Group	25	23.12	578.00	253.00	11.50	.24	-0.19
		Control	25	27.88	697.00		12.00		
	7th Day	Study Group	25	25.50	637.50	312.50	11.50	1.00	0.00
		Control	25	25.50	637.50		11.50		
Tragus-Pogonion	Preoperative	Study Group	25	26.08	652.00	327.00	14.50	.78	0.05
		Control	25	24.92	623.00		14.50		
	2nd Day	Study Group	25	25.18	629.50	304.50	15.00	.88	-0.03
		Control	25	25.82	645.50		15.00		
	7th Day	Study Group	25	26.42	660.50	335.50	14.50	.65	0.07
		Control	25	24.58	614.50		14.50		
Eye-Mandibular Corner	Preoperative	Study Group	25	25.30	632.50	307.50	10.50	.93	-0.02
		Control	25	25.70	642.50		10.50		
	2nd Day	Study Group	25	24.64	616.00	291.00	11.00	.68	-0.07
		Control	25	26.36	659.00		11.00		
	7th Day	Study Group	25	24.86	621.50	296.50	10.50	.75	-0.05
		Control	25	26.14	653.50		10.50		
MMO	Preoperative	Study Group	25	25.02	625.50	300.50	4.00	.81	-0.04
		Control	25	25.98	649.50		4.50		
	2nd Day	Study Group	25	27.34	683.50	358.50	3.00	.37	0.15
		Control	25	15.50	591.50		2.50		
	7th Day	Study Group	25	26.88	672.00	347.00	4.00	.50	0.11
		Control	25	24.12	603.00		4.00		

Note: Descriptive statistics and Mann-Whitney U test results for swelling and maximum mouth opening (MMO) measurements are presented, including Mean Rank, Sum of Ranks, W (test statistic), Median, P (p-value), and r (effect size).

Table 3. Descriptive statistics for pain and bleeding based on groups

Group	Measurement	Day	M	SD	S	K
Study Group	**Pain**	1st Day	4.20	1.69	0.04	2.29
		2nd Day	2.52	1.48	0.05	2.18
		3rd Day	1.76	2.39	1.94	6.80
		7th Day	0.14	0.34	2.07	5.47
	Bleeding	1st Day	3.16	1.72	0.23	2.50
Control	**Pain**	1st Day	3.98	2.19	0.49	2.65
		2nd Day	1.96	1.50	0.90	3.72
		3rd Day	1.08	1.26	1.54	5.04
		7th Day	0.22	0.61	2.42	6.98
	Bleeding	1st Day	2.82	1.79	-0.26	1.98

Note: Descriptive statistics, including Mean (M), Standard Deviation (SD), Skewness (S), and Kurtosis (K), are presented for bleeding levels and pain. The Shapiro-Wilk Test confirmed that the data did not meet the normality assumption. Therefore, Mann-Whitney U Test was used for between-group comparisons, and Wilcoxon Signed-Rank Test was applied for within-group analyses.

Secondary Outcomes

Patient-reported outcomes were collected to assess comfort, movement restriction, and usability of the KT application.

Comfort: 88% of participants reported slight discomfort, 8% experienced significant discomfort, and 4% reported no discomfort.

Movement Restriction: 52% reported slight restriction, while 48% experienced no limitation. No participant reported severe restriction.

Usability: 56% of participants considered KT impractical, while 44% found it useful. Aesthetic concerns and interference with daily activities were the most common reasons cited for reduced practicality.

Table 4. Mann-Whitney U test results for pain and bleeding

Variable	Time	Group	N	Mean Rank	Sum of Ranks	W	Median	*P*	r
Pain	1st Day	Study Group	25	24.24	606.00	281.00	4.00	.54	-0.10
		Control	25	26.76	669.00		4.00		
	2nd Day	Study Group	25	22.48	562.00	237.00	2.00	.14	-0.24
		Control	25	28.52	713.00		3.00		
	3rd Day	Study Group	25	24.28	607.00	282.00	1.00	.55	-0.10
		Control	25	26.72	668.00		1.00		
	7th Day	Study Group	25	25.76	631.00	306.00	0.00	.85	-0.02
		Control	25	25.24	644.00		0.00		
Bleeding	1st Day	Study Group	25	24.44	611.00	286.00	3.00	.61	-0.08
		Control	25	26.56	664.00		3.00		

Note: Descriptive statistics and Mann-Whitney U test results for pain and bleeding levels are presented, including Mean Rank, Sum of Ranks, W (test statistic), Median, P (p-value), and r (effect size).

DISCUSSION

This study investigated the efficacy of KT in managing postoperative swelling, pain, trismus, and bleeding following the surgical removal of impacted mandibular third molars. Unlike previous studies reporting significant improvements with KT, our findings did not reveal statistically significant differences between the experimental and control groups. This suggests that KT's effectiveness may be influenced by factors such as application technique, anatomical region, and patient-specific variability, warranting further investigation.

Postoperative pain, as expected, peaked on the first day and gradually subsided by the seventh day, with no significant differences between the groups. KT is widely used in musculoskeletal rehabilitation, particularly for knee osteoarthritis, shoulder impingement, and chronic low back pain, yet systematic reviews suggest that its benefits are primarily short-term and do not surpass conventional physical therapy techniques such as exercise or manual therapy.[10] Similarly, KT's role in sports injury management remains inconclusive, showing no significant advantages over traditional bandaging methods.[11] These findings align with our results, indicating that KT may not be a universally effective intervention for postoperative pain and swelling management.

Swelling followed a typical pattern, peaking on the second day and resolving by the seventh day in both groups. Although KT has been proposed to enhance lymphatic drainage and circulation, evidence suggests only mild efficacy in reducing postoperative edema.[12,13] Our findings support this, showing no significant differences between groups, possibly due to the anatomical constraints of the maxillofacial region, which may limit KT's impact compared to larger joints where greater tissue mobilization occurs.

Interestingly, muscle activation-based approaches have gained attention in edema reduction. A randomized controlled study by Olmez et al.[14] demonstrated that platysma exercises significantly reduced postoperative edema, suggesting an active mechanism that complements passive therapies. In contrast, our findings indicate that passive KT alone may not be sufficient. Given its inconsistent impact, KT's potential benefits may be enhanced when combined with active facial muscle exercises, highlighting the need for further investigation into integrated rehabilitation approaches.

Trismus, assessed through interincisal distances, showed comparable improvement across groups, with no statistically significant advantage of KT. Similarly, previous studies (e.g., Tozzi et al.[15]) reported

no significant differences in pain or trismus improvement with KT. These findings suggest that KT does not influence jaw mobility recovery postoperatively.

Bleeding, evaluated on the first postoperative day, was comparable between groups, reinforcing that KT does not interfere with hemostasis or wound healing. However, its potential effects on vascular permeability and microcirculation warrant further investigation.

More than half of the patients (56%) in this study found KT impractical, and a proportion reported discomfort, including 8% with significant complaints. This is an important clinical observation, as it highlights that despite being a non-invasive intervention, KT may not be well tolerated by patients. Aesthetic concerns, movement restrictions, and discomfort can reduce adherence, thereby limiting the clinical utility of KT in postoperative care. Similar findings were reported by Patil et al.[16] , who observed that although KT did not cause skin irritation, some patients were reluctant to engage in social activities due to its visible appearance. In the maxillofacial context, where facial aesthetics and mobility are critical, these drawbacks may be even more pronounced than in musculoskeletal applications. Future research should therefore aim to modify application techniques to improve comfort and acceptance, for example through shorter application durations, less visible positioning, or combination with other rehabilitation strategies. Addressing these usability issues is essential if KT is to be considered a viable adjunctive therapy.

In the literature, various KT application techniques have been proposed for managing postoperative sequelae after third molar surgery. Techniques adapted from Ristow et al.[7] typically involve a three-strip fan-shaped application starting at the supraclavicular lymph nodes and extending toward the tragus and cheilon, thereby promoting lymphatic drainage from high- to low-pressure zones. Yurttutan et al.[17] applied the web-strip technique, and da Rocha Heras et al.[18] positioned tape from the labial commissure to the earlobe, with all of these protocols demonstrating positive effects. In contrast, our study employed a fan-shaped buccal application, with the tape base placed between the tragus and mandibular angle and the tails directed anteriorly toward the nasal ala, labial commissure, and mandibular body. This method, often adapted from TMD rehabilitation, is believed to act primarily through neuromuscular mechanisms, such as modulating muscle tone, relieving tension in the masseter region, and stimulating cutaneous mechanoreceptors to enhance proprioception and reduce pain perception.[19] While these mechanisms may explain the favorable outcomes reported in TMD management, they might not adequately address postoperative lymphatic drainage requirements. This divergence from lymph-directed protocols may partly explain why our results did not demonstrate significant benefits, particularly in terms of swelling. Moreover, the finding that a method effective for pain and trismus reduction in TMD patients did not produce similar improvements after impacted third molar surgery is noteworthy, suggesting that KT's clinical efficacy may depend strongly on indication and application technique.

Several studies have suggested KT's effectiveness in reducing edema and improving functional outcomes.[7,16,17,20] These differences in results may be attributable to methodological variations. First, the application technique in our study was buccal and neuromuscular in orientation, whereas other studies employed lymph-directed taping methods that may more effectively promote drainage. Second, practitioner expertise can influence outcomes, and in our study, all applications were performed by the same oral and maxillofacial surgeon under physiotherapist consultation, which differs from studies where applications were performed by physiotherapists with extensive taping experience. Finally, patient populations may also contribute to variability, as baseline characteristics such as age, tissue thickness, and healing capacity can influence KT efficacy. Together, these factors may explain why our findings diverged from previously published positive results.

This study has limitations, primarily a relatively small sample size and lack of blinding, which may introduce bias. While the limited sample size could reduce the ability to detect small-to-moderate effects, the consistently small effect sizes across all outcomes suggest that the absence of statistical significance more likely reflects a true lack of clinically meaningful benefit rather than a type II error. Moreover, pain, swelling, and trismus are interdependent variables, making it difficult to isolate the specific contribution of KT. Another limitation is that swelling was assessed using linear measurements between anatomical points, which, although widely used in clinical studies, is less sensitive than three-dimensional imaging techniques. Future research should aim to standardize KT application techniques and swelling assessment methods, explore its integration with active muscle exercises, and include larger, multicenter trials with extended follow-up periods.

CONCLUSION

KT did not yield statistically significant improvements in postoperative swelling, pain, trismus, or bleeding compared to standard care following mandibular third molar surgery. While KT remains a safe and adjunctive option, its clinical relevance appears limited, particularly in the maxillofacial region. In addition, more than half of the patients considered KT impractical and some reported discomfort, indicating that patient acceptance is a critical barrier to its clinical applicability. Future studies should refine KT application methods and explore its integration with active rehabilitation strategies. Until further high-quality evidence emerges, conventional postoperative care remains the primary approach for symptom management following oral surgery.

Ethics Committee Approval: The study was approved by the Turkish Ministry of Health, Turkey Pharmaceuticals and Medical Devices Agency (Decision No: E-68869993-511.06-757804) and Ondokuz Mayıs University Clinical Research Ethics Committee (Date: December 29, 2021, Decision No: 2021/686). The study adhered to the principles of the Helsinki Declaration.

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