

## Kinesiology tape in comparison with oral Diclofenac sodium in reducing swelling after surgical removal of lower wisdom teeth

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### الخلاصة

**الاهداف:** تهدف الدراسة إلى المقارنة بين طريقتين في تخفيض الوذمة المصاحبة لقلع ضرس العقل السفلي المظمور. **المواد وطرائق العمل:** تم اختيار مجموعتين عشوائيتين للمرضى، كل مجموعة تضم ١٥ مريضاً، المجموعة الأولى تم وصف عقار حب الفولتارين ٥٠ ملغم فمويًا ثلاث مرات يوميًا لمدة أسبوع والمجموعة الثانية تم استخدام لاصق الكنزيبولوجي موضعياً خارج الفم لمدة سبعة أيام، تم تقييم الوذمة باستخدام الشريط المدرج لليوم الأول والثالث والسابع. **النتائج:** كان هناك فرق احصائي معنوي للوذمة بين استخدام الطريقتين بشكل واضح في اليوم الأول والثالث والسابع. **الاستنتاجات:** نستنتج من ذلك ان استخدام شريط الكنزيبولوجي مقارب بالتأثير إلى حب الفولتارين في تخفيض الوذمة لذلك يعد شريط الكنزيبولوجي علاجاً مساعداً عند المرضى الذين لا يمكن استخدام الفولتارين معهم مثل ارتفاع ضغط الدم أو الربو المزمن وكذلك الحمل وقرحة المعدة.

### ABSTRACT

**Aims:** The aims of the research are to estimate the usefulness of two methods in reducing post-operative swelling following extraction of lower third molar teeth. **Materials and Methods:** This study included 30 cases had partially erupted lower third molar teeth of diverse surgical complexity. The patients were divided into two groups, in the first group, Kinesiology tape applied for 7 days, Diclofenac Na<sup>+</sup> (Voltarin) 50mg tablet were given to the patients in the second group post operatively three times each day for seven days. Swelling was assessed by a ribbon gauge method. Assessments were done on first day of surgical management and on seventy-two hours and seven days afterward. **Results:** statistically significant difference were recognized for swelling values between two treatment groups on the 1<sup>st</sup>, 3<sup>rd</sup> and 7<sup>th</sup> day subsequent to surgical work. **Conclusions:** The use of Kinesiology tape have nearly the same effectiveness compared with Voltarin tablets in reducing post-operative swelling.

**Key words:** Kinesiology tape, Diclofenac, wisdom teeth removal

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### INTRODUCTION

Surgical intervention of impacted lower third wisdom teeth is a familiar intraoral surgical practice <sup>(1)</sup> and it is often accompanied by unpleasant bothering sequelae, to the patients <sup>(2)</sup>. An impacted tooth is that tooth fails

to explode into the dental arches within the predictable time of eruption <sup>(3)</sup>. The surgical removal of lower wisdom teeth may consequence in a numeral of problems counting ache, edema, hemorrhage, alveolar osteitis or neural paraesthesia <sup>(4)</sup>. Patient's factors, tooth-related factors and the surgeon's working skill

and abilities are in general the major causes of such problems <sup>(5)</sup>. Several methods were used to manage the instant inflammatory reaction accompanied with any surgical intervention utilizing of medicine such as pain killers, steroids, antibacterial, proteolytic enzymes, LASER appliance, and physical cryotherapy, or physical lymphatic drainage <sup>(6-13)</sup> kinesiology tape (KT) has more and more acceptance in dealing with sport traumas and other conditions like supporting traumatized muscles or joints, alleviating ache, rising blood and lymph flood in the affected region but need conformations for all these properties <sup>(14)</sup>. Utilization of NSAIDs has been examined with regard to decrease ache and inflammatory process. Recently, it is obvious that the mixture of one more method with an NSAID is often more efficient in reducing postoperative ache and edema in maxillofacial surgical procedure than a NSAIDs alone<sup>(15)</sup>. The kinesiology tape (KT) had a special mechanism of action by elevating the skin, recover the blood and lymph gush and removing congestions of lymphatic fluid and /or hematomas <sup>(16)</sup> by performing room, fluids are encouraged to shift from areas of superior pressure towards the vicinity of inferior pressure according to the direction of application topically <sup>(17,18)</sup>. The aims of the proposed research are to estimate the usefulness of two methods in reducing post-operative swelling following extraction of third molar teeth.

## MATERIALES AND METHODS

This research was performed at University of Mosul/ College of Dentistry/ Department of Oral and Maxillofacial Surgery, and approved by the local academic committee according to applicable rules. A case record particularly considered for this research was used for every patient. Thirty healthy fit patients were haphazardly selected with an age diversity 18–32 years. The enrolled cases had third molar impaction supported by clinical and intraoral periapical and orthopantomograph.

### Inclusion criteria:

1. Unilateral incomplete or complete bony embedded mandibular third molar teeth with Class I, II or III and position A, B or C, according to Pell and Gregory categorization on a radiograph.
2. Out of pericoronitis and free from inflammation at the incident of surgical work.

### Exclusion criteria:

1. History of threatened health condition.
2. History of allergic reaction or sensitivity to the medicine used in this study.
3. Expectant or breast feeding women.

4. Patients rejected being concerned in research or those who could not be present at the next appointments or those who took non-experiment remedy during the study episode.

All the cases were performed by the same surgeon, all of the embedded teeth were surgically removed by performing local anesthesia obtained by inferior alveolar nerve, lingual and long buccal nerve block injection by means of two cartridge of 2% Lidocaine with 1:80 000 adrenalines 1.8 ml. The extraction of the embedded teeth was achieved subsequent the typical route including modified flaps. The bony cavity was cleaned by chlorhexidine 0.2%. Following extraction, suturing of the flap performed. The patients were randomly distributed to two study groups; on the end of surgery all patients were prescribed amoxicillin 500mg capsule (SDI, Iraq) three periods a day for 72 hours for group 1 and 2, diclofenac sodium 50mg tab (*Novartis*, UK) was given three times daily for 72 hours for group 1 only and a Kinesiology tape applied

extraorally for group 2 only for seven days. Evaluation of swelling was instinctively evaluated and as follows: Four facial readings by means of bendable length evaluating strip to approximate millimeter was assessed to be a baseline data for recording of facial swelling, these facial readings consist of: Tragus-midline (pogonion), Tragus-commissure of mouth, and Gonion-lateral canthus before the work readings (in millimeters) were calculated as the baseline for that part<sup>(19)</sup>. These measurements done in first day, third day and seventh day. Statistical analysis of the data was performed using Krusal-Wallis test and Mann-Whitney test, nonparametric test by use SPSS program version 25 windows. Level of significance was measured at  $p < 0.05$ .

## **RESULTS**

The demographic sex distribution and the mean age of all patients included in the present study are shown in Table (1). Swelling parameter according to the time shown in Figure(1).

Table (1): Age and Sex distribution and mean age of patients

<b>Group</b>	<b>Material used</b>	<b>Male</b>	<b>Female</b>	<b>Age (years)</b>	<b>Mean</b>
I	Voltarin	10	5	18-32	25
II	Kinesiology tape	7	8	18-31	24.5

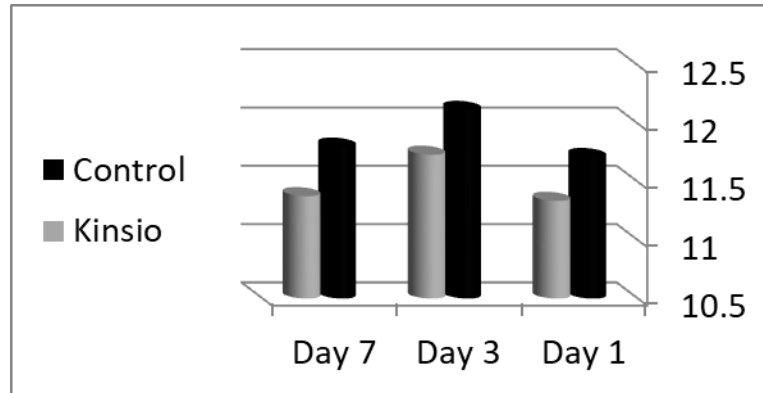


Figure (1): Comparison of swelling between groups

A descriptive statistical analysis related to the reading related to day one was significant (0.029), and it was highly significant in reading of day three (0.000) and day seven (0.001) as shown in Table (2), swelling: Concerning post-operative swelling, the preoperative reading statistically was not significant (0.709), while

the reading related to day one was significant (0.029), and it was highly significant in reading of day three (0.000) and day seven (0.001) as shown in Table (3).

Table (2): Descriptive statistical analysis for both groups

Voltarin	Swelling				Kinsio	Swelling			
	Pre	Day1	Day3	Day7		Pre	Day1	Day3	Day7
Mean	11.756	13.008	16.899	13.887	Mean	11.325	11.337	11.732	11.377
SD*	2.141	1.873	2.391	2.079	SD*	0.591	0.612	0.659	0.639
SE**	0.553	0.484	0.617	0.537	SE**	0.152	0.158	0.17	0.165
Median	11.67	13.56	17.74	14.33	Median	11.03	11.07	11.63	11.2
IQR***	4	3.45	4.26	3.3	IQR***	0.53	0.63	0.77	0.67

\*SD=standard deviation, \*\* SE=standard error, \*\*\*IQR=interquartile range

Table (3): Comparison between the groups by Mann-Whitney test:

<b>Parameter and time</b>	<b>Asymp. Sig. (2-tailed)</b>	<b>Voltarin versus Kinesiology tape</b>
Swelling-Pre	0.709	p>0.05 (not significant)
Swelling-Day1	0.029	p<0.05 (significant)
Swelling-Day3	0.000	p<0.001 (highly significant)
Swelling-Day7	0.001	p<0.01 (highly significant)

## DISCUSSION

In third molar surgery among many methods for reducing edema, ice therapy is an easy, inexpensive, repeatable modality by modification of blood stream, resultant vasoconstriction and abridged metabolism, consequently dropping microbial development<sup>(12)</sup>. Application of corticosteroids is widespread in oral and maxillofacial surgical interventions<sup>(20)</sup> including third molar extraction<sup>(21)</sup>. Utilization of NSAIDs has been examined with regard to decrease ache and inflammatory process<sup>(15)</sup>. So in this study using Diclofenac sodium tablet is more efficient in reducing swelling as it has a direct effect anti-inflammatory effect. With any medicine used to alleviate postsurgical unpleasant sequelae, drug hypersensitivity and drug-linked side effects are focusing more awareness on another method. In an initial research, Szolonoky et al. examined the effectiveness of manual lymph drainage (MLD) after wisdom teeth extraction and he gets a frank reduction of postoperative swelling and ache<sup>(13)</sup>. Even though Kinesiology tape has been progressively used in the therapy

protocols and avoidance of sport wounds, there is no apparent proof as regards to probable mechanisms underlying the advantageous effects of KT<sup>(14)</sup>. KT has a probable power on the reduction of swelling and bleeding. Researches carried out on the management of neoplastic or cancer related lymphedema, have no evidence-based consequence<sup>(15,22,23)</sup>. In our study there was significant difference between group 1 and group 2 in day 1, day 3 and day 7 in the mean readings of swelling as the KT had immediate action and the Voltarin tab. need more time to work.

## CONCLUSION

This research proves the proposition that Kinesiology tape has an anti-inflammatory actions post third molar tooth extraction. on the other hand, swelling parameters get significant reduction that increases the likelihood of using Kinesiology tape as an ancillary treatment in medically compromised patients like essential elevated blood pressure, respiratory diseases, expectant female, duodenal and gastric ulcer, any contraindications of taking NSAIDs that is accustomed to lowering ache and swelling.

Further studies examining these parameters at different times are necessary, and using different directions of Kinesiology tape is needed.

## REFERENCES

1. Mercier P, Precious D. Risks and benefits of removal of impacted third molars. A critical review of the literature. *International Journal Oral Maxillofacial Surgery*; 1992, 21:17-27.
2. Saheeb BD, Obuekwe ON. An audit of mandibular third molar surgery. *Nigerian Journal Surgery Research*, 2001; 3: 66-74.
3. Larry J. Peterson. Peterson`s Contemporary Oral and Maxillofacial Surgery; Mosby, Fourth edition; 2003; 184.
4. Benediktsdottir IS, Wenzel A, Petersen JK, Hintze H: Mandibular third molar removal: risk indicators for extended operation time, postoperative pain, and complications. *Oral Surgery Oral Medicine Oral Pathology Oral Radiology Endodontic*, 2004, 97:438-446.
5. Berge TI, Boe OE: Predictor evaluation of postoperative morbidity after surgical removal of mandibular third molars. *Acta Odontologica Scandinavica* 1994, 52:162-169.
6. Kim K, Brar P, Jakubowski J, Kaltman S, Lopez E. The use of corticosteroids and nonsteroidal anti-inflammatory medication for the management of pain and inflammation after third molar surgery: a review of the literature. *Oral Surgery Oral Medicine Oral Pathology Oral Radiology Endodontics*. 2009; 107:630–640.
7. Aznar-Arasa L, Harutunian K, Figueiredo R, Valmaseda-Castellon E, Gay-Escoda C. Effect of preoperative ibuprofen on pain and swelling after lower third molar removal: a randomized controlled trial. *International Journal of Oral and Maxillofacial Surgery*. 2012; 41:1005–1009.
8. Thoren H, Snall J, Kormi E, Numminen L, Fah R, Iizuka T. Does perioperative glucocorticosteroid treatment correlate with disturbance in surgical wound healing after treatment of facial fractures? A retrospective study. *Journal of Oral and Maxillofacial Surgery*. 2009; 67:1884–1888.
9. Knevil GJ, Loukota RA. Outcomes of prophylactic antibiotics following surgery for zygomatic bone fractures. *Journal of Craniomaxillofacial Surgery*. 2010; 38:131–133.
10. Al-Khateeb TH, Nusair Y. Effect of the proteolytic enzyme serrapeptase on swelling, pain and trismus after surgical extraction of mandibular third molars. *International Journal of Oral and Maxillofacial Surgery*. 2008; 37:264–268.
11. Markovic A, Todorovic L. Effectiveness of dexamethasone and low-power laser in minimizing oedema after third molar

- surgery: a clinical trial. *International Journal of Oral and Maxillofacial Surgery*. 2007; 36:226–229.
12. Rana M, Gellrich NC, von See C, Weiskopf C, Gerressen M, Ghassemi A. 3D evaluation of postoperative swelling in treatment of bilateral mandibular fractures using 2 different cooling therapy methods: a randomized observer blind prospective study. *Journal of Craniomaxillofacial Surgery*. 2013;41(1):17–23.
13. Szolnoky G, Szendi-Horvath K, Seres L, Boda K, Kemeny L. Manual lymph drainage efficiently reduces postoperative facial swelling and discomfort after removal of impacted third molars. *Lymphology*. 2007; 40:138–142.
14. Williams S, Whatman C, Hume PA, Sheerin K. Kinesio taping in treatment and prevention of sports injuries: a meta-analysis of the evidence for its effectiveness. *Sports Medicine*. 2012; 42:153–164.
15. Gassner R, Tuli T, Hachl O, Rudisch A, Ulmer H. Cranio-maxillofacial trauma: a 10-year review of 9543 cases with 21,067 injuries. *Journal of Craniomaxillofacial Surgery*. 2003; 31:51–61.
16. Chou YH, Li SH, Liao SF, Tang HW. Case report: manual lymphatic drainage and Kinesio taping in the secondary malignant breast cancer-related lymphedema in an arm with arteriovenous (A-V) fistula for Hemodialysis. *American Journal of Hospice and Palliative Care*: 2012, 22879520
17. Kase K, Hashimoto T, Tomoki O. Development of Kinesio taping perfect manual. Kinesio Taping Association, 1996.
18. Kase K, Wallis J, Kase T. Clinical therapeutic applications of the Kinesio taping method. 2. Tokyo: Ken Ikai Co., Ltd; 2003.
19. Schultze-Mosgau S, Schmelzeisen R, Frölich JC, Schmele H: Use of Ibuprofen and Methylprednisolone for the Prevention of Pain and Swelling After Removal of Impacted Third Molars *Journal of Oral and Maxillofacial Surgery*. 1995, 53:2-7.
20. Assimes TL, Lessard ML. The use of perioperative corticosteroids in Craniomaxillofacial surgery. *Plastic Reconstruction Surgery*. 1999; 103:313–321.
21. Grossi GB, Maiorana C, Garramone RA, Borgonovo A, Beretta M, Farronato D, et al. Effect of submucosal injection of dexamethasone on postoperative discomfort after third molar surgery: a prospective study. *Journal of Oral and Maxillofacial Surgery*. 2007; 65:2218–2226.
22. Tsai HJ, Hung HC, Yang JL, Huang CS, Tsauo JY. Could Kinesio tape replace the

- bandage in decongestive lymphatic therapy for breast-cancer-related lymphedema? A pilot study. *Support Care Cancer*. 2009; 17:1353–1360.
23. Tozzi U., Santagata M., Sellitto, A. Tartaro G. P. Influence of Kinesiologic Tape on Postoperative Swelling After Orthognathic Surgery, *Journal of Maxillofacial and Oral Surgery*, 2016;15(1):52-58.