



# Kinesio taping in reducing pain, swelling and trismus after impacted third molar surgery

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## ABSTRACT

**AIM:** To evaluate effectiveness of kinesio tape on reducing postoperative sequelae in mandibular third molar surgery.

## OBJECTIVE:

1. To evaluate effectiveness of kinesio tape on reducing post-operative swelling in mandibular third molar surgery .
2. To evaluate effectiveness of kinesio tape on reducing post-operative pain in mandibular third molar surgery
3. To evaluate effectiveness of kinesio tape on reducing post-operative trismus in mandibular third molar surgery

## MATERIALS AND METHOD:

**POPULATION:** patients undergoing surgical removal of impacted mandibular third molar

**INTERVENTION:** Application of kinesio tape post operatively

**COMPARISON:** Regular post operative management.

**OUTCOME:**post operative swelling, pain and trismus.

**RESULT:** A statistically significant decrease in swelling and mouth opening score is observed

**CONCLUSION:** Kinesio taping (KT) is an effective technique with no side effects which is simple to use and contributes in reducing postoperative sequelae in mandibular third molar surgery.

**Keywords:** Mandibular third molar surgery, kinesio taping, pain,swelling,trismus.

## INTRODUCTION:

“ An impacted tooth is one that is partially or completely unerupted, beyond the chronological date of eruption , and will not eventually assume a normal

relationship with the other teeth and tissues” .

Surgical removal of impacted third molar is the most common intervention in oral and maxillofacial surgery which have the risk

of infectious and non-infectious postoperative complications.

The triad of the non-infectious complications, i.e., post-extraction pain, trismus, and the swelling which attributes due to the inflammatory reaction caused due to surgical trauma which can happen due to hard and soft tissue manipulation .After wearing off effect anesthesia patient experiences maximum intensity of pain around 3 to 5 hours and usually lasts for 2 to 3 days and then gradually disappears .On the other hand swelling starts resolving after 5-7 days and have maximum swelling in 2-3 day. However, trismus is present until there is complete resolution of pain and swelling

(1, 2).

Kinesio taping (KT) stimulates lymphatic drainage by directing inflammatory fluids in desired direction from areas of higher pressure to lower pressure, thus this physical therapy is based on the body's self regulating process (3).

#### **MATERIALS AND METHOD:**

##### **PATIENTS:**

##### **INCLUSION CRITERIA:**

The study included patients above 18 years reported to our OPD for surgical removal of impacted teeth.

**EXCLUSION CRITERIA :** patients younger than 18 years old, Patient with known comorbidities and under any medication ,pregnant or lactating women, tobacco consumption , known history of allergy to tape or to any medication , hesitancy to shave facial hair (for men) .

**INTERVENTION:** Post operative application of kinesio tape after surgical removal of impacted third molar.

##### **OUTCOME:**

Post operative pain , swelling and trismus are measured in control and study group.

Surgical procedure for surgical extraction of impacted tooth:

All the surgical extractions of the mandibular third molar were performed by the same oral and maxillofacial surgeon under local anesthesia. Under sterile conditions following a standard operating protocol .Inferior alveolar nerve block was given with 2% lignocaine with 1:200000 adrenaline and then surgical scalpel is used for incision to raise the full thickness mucoperiosteal flap . The osteotomy was performed using round and 702 burs with sufficient amounts of sterile saline irrigation , crown sectioning are if needed. Elevator or dental forceps is used for extraction. Curettage of the socket and then irregular bony margins were smoothed. Hemostasis achieved and wound closure was done using 4-0 resorbable sutures (Vicryl; Ethicon®, U.S.A). Postoperative antibiotics (amoxicillin + clavulanic acid ), a non-steroidal anti-inflammatory agent and an antiseptic mouthwash (chlorhexidine gluconate ) were prescribed. Routine postoperative instructions were given and to avoid risk of pain masking effect ice pack application is avoided.

##### **KINESIO TAPING PROCEDURE:**

After the surgical extraction of the impacted tooth, the skin was cleaned, if necessary shaved , length of the tape to be used was customized for each patient , distance is calculated between clavicle to the point of the face where maximum swelling is anticipated ( Tape should be in a stretched position). The tape was equally divided into five strips of equal length of

around 1.5 cm and was placed just above the target area for drainage i.e supraclavicular nodes . Placement of the lymphatic strips was directed by the location of the lymphatic duct crossing the cervical, submental, mandibular, submandibular, preauricular, and parotid nodes to the area of maximum swelling.

**SWELLING:**

A flexible ruler are used to measure swelling , the extent of swelling were measured at 4 points on the face in mm

Line A—from tragus (T) to corner of mouth

Line B—from exocanthion (Ex) to gonion (Go)

**Truism:**

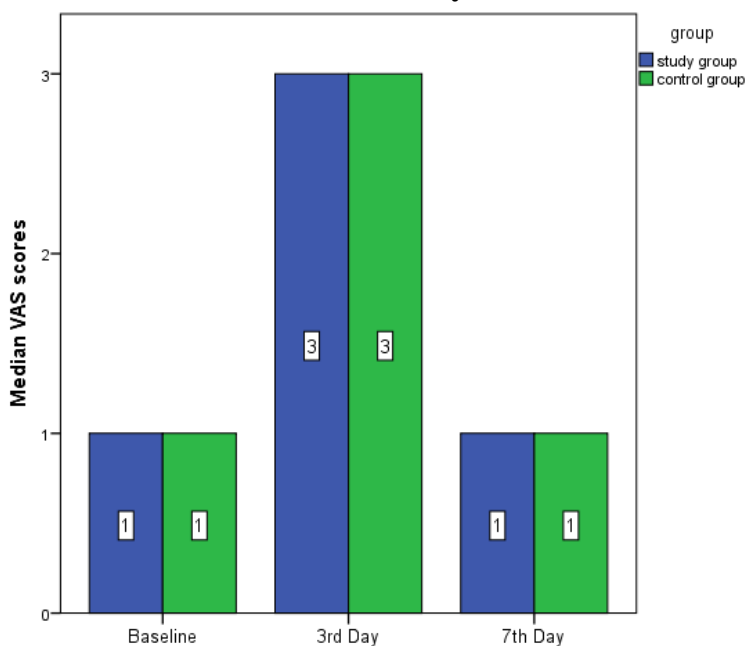
Trismus is assessed by maximum mouth opening , which is assessed by measuring maximum interincisal distance in mm.

**Pain:**

Pain is assessed by visual analog scale.

**STATISTICAL ANALYSIS AND RESULT:**

**Graph 1: Median pain scores between study and control group at baseline, 3<sup>rd</sup> day and 7<sup>th</sup> day**



**Table 1: Comparison of median pain scores between study and control group at baseline, 3<sup>rd</sup> day and 7<sup>th</sup> day**

|          | Group         | N  | Median | IQR   | Mean Rank | Mann Whitney U | P Value   |
|----------|---------------|----|--------|-------|-----------|----------------|-----------|
| Baseline | Study Group   | 15 | 1      | 1 – 1 | 15.9      | 106.5          | P = 0.806 |
|          | Control Group | 15 | 1      | 1 – 1 | 15.1      |                | NS        |

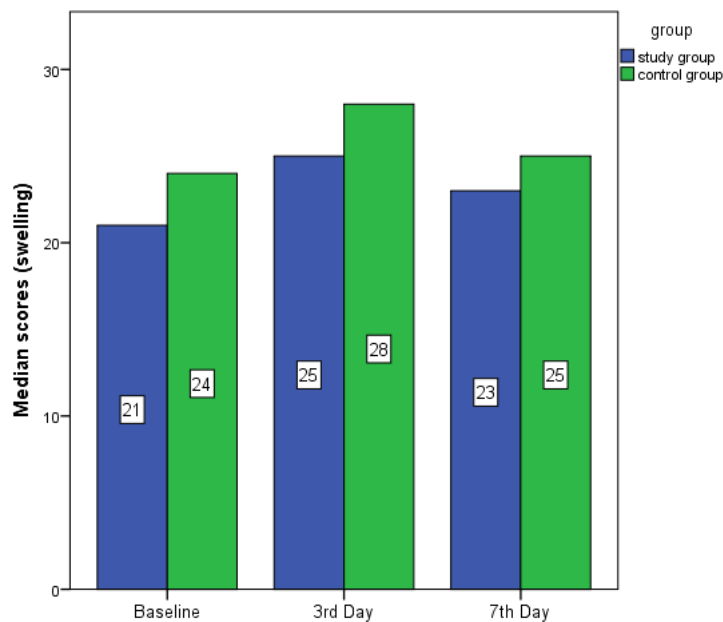
|         |               |    |   |       |       |     |          |
|---------|---------------|----|---|-------|-------|-----|----------|
| 3rd Day | Study Group   | 15 | 3 | 2 – 4 | 16.67 | 95  | P = 0.48 |
|         | Control Group | 15 | 3 | 2 – 3 | 14.33 |     | NS       |
| 7th Day | Study Group   | 15 | 1 | 1 – 2 | 16.2  | 102 | P = 0.68 |
|         | Control Group | 15 | 1 | 1 – 2 | 14.8  |     | NS       |

Level of significance at  $P < 0.05$   
 NS-Not significant using Mann Whitney U test

scores at baseline ( $P = 0.806$ ), on 3<sup>rd</sup> day ( $P = 0.48$ ) and on 7<sup>th</sup> day ( $P = 0.8$ ) between study and control group.

It was found that there were no statistically significant differences in median pain

**Graph 2: Median measurement of swelling between study and control group**



**Table 2: Comparison of median scores (swelling) between study and control group at baseline, 3<sup>rd</sup> day and 7<sup>th</sup> day**

|          | Group         | N  | Median | IQR     | Mean Rank | Mann Whitney U | P Value  |
|----------|---------------|----|--------|---------|-----------|----------------|----------|
| Baseline | Study Group   | 15 | 21     | 20 - 25 | 13.53     | 83             | P = 0.23 |
|          | Control Group | 15 | 24     | 21 - 26 | 17.47     |                | NS       |
| 3rd Day  | Study Group   | 15 | 25     | 24 - 28 | 11.8      | 57             | P =      |
|          | Control Group | 15 | 28     | 25 - 31 | 19.2      |                | 0.021*   |

|         |               |    |    |         |       |    |            |
|---------|---------------|----|----|---------|-------|----|------------|
| 7th Day | Study Group   | 15 | 23 | 21 - 26 | 12.27 | 64 | P = 0.045* |
|         | Control Group | 15 | 25 | 23 - 27 | 18.73 |    |            |

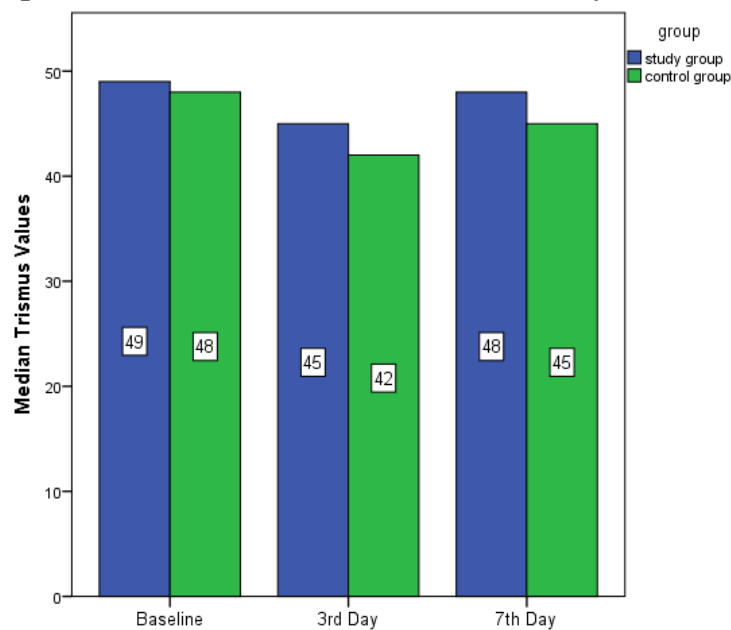
Level of significance at  $P < 0.05$

NS-Not significant and \*statistically significant using Mann Whitney U test

It was found that there was a statistically significant decrease in median swelling scores in study group on 3<sup>rd</sup> day ( $P = 0.021$ )

and on the 7<sup>th</sup> day ( $P = 0.045$ ). There was no statistically significant differences in median scores at baseline ( $P = 0.23$ ).

**Graph 3: Median trismus scores between study and control group**



**Table 3: Comparison of median scores (trismus) between study and control group at baseline, 3<sup>rd</sup> day and 7<sup>th</sup> day**

|          | Group         | N  | Median | IQR     | Mean Rank | Mann Whitney U | P Value    |
|----------|---------------|----|--------|---------|-----------|----------------|------------|
| Baseline | Study Group   | 15 | 49     | 47 - 51 | 17.57     | 81.5           | P = 0.2    |
|          | Control Group | 15 | 48     | 46 - 50 | 13.43     |                |            |
| 3rd Day  | Study Group   | 15 | 45     | 43 - 48 | 19.07     | 59             | P = 0.026* |
|          | Control Group | 15 | 42     | 41 - 45 | 11.93     |                |            |
| 7th Day  | Study Group   | 15 | 48     | 46 - 49 | 18.87     | 62             | P = 0.037* |
|          | Control Group | 15 | 45     | 44 - 48 | 12.13     |                |            |

Level of significance at  $P < 0.05$

NS-Not significant and \* statistically significant using Mann Whitney U test

It was found that there was a statistically significant increase in median mouth

opening scores in study group on 3<sup>rd</sup> day ( $P = 0.026$ ) and on the 7<sup>th</sup> day ( $P = 0.037$ ).

There was no statistically significant differences in median scores at baseline ( $P = 0.2$ ).

#### **DISCUSSION:**

Dr. Kase in the 1970s invented Kinesio taping an elastic-therapeutic bandage is a popular technique in maxillofacial surgery for management of postoperative edema which . When compared with conventional tape KT are thinner and elastic and allows greater mobility and skin traction and also regulates blood and lymphatic flow .

Kinesio Taping is a combination of applying tension along the tape and the target muscle is placed in a stretched position, so convolutions in the tape occur after the application .According to the manual of Kinesio Taping Method , this traction reduces the nociceptive stimuli by reducing the pressure on the mechanoreceptors that are situated below the dermis by elevating epidermis . Other benefits include improved blood and lymphatic flow , reduced pain intensity, realignment of joints and change in the recruitment activity patterns of the treated muscles . It is also found that Kinesio Tape application did not disturb their daily activities and had better Quality of life than those in the control group [4].

Kinesio tapes , thin and flexible tapes which stretch up to 30–40% of their original length and do not limit mobility of the body and their thickness, specific weight, and extensibility of the tapes are similar to the properties of the epidermis[5].

Other than improving blood and lymphatic circulation it also promotes sensory motor stimulus across skin receptors and mechanoreceptors found in joints or

muscles ( Ristow et al., 2014). Taping therapy has shown to have effectively satisfactory results in restoring muscle function and in decreasing pain (Akbas et al., 2011) . It has a variety of physiological effects such as analgesia, easy blood and lymphatic circulation, musculoskeletal imbalance compensation or correction, and joint correction (Briem et al., 2011, Fu et al., 2008).

On the other hand some studies did not find effectiveness in kinesio taping (KT) application in patients diagnosed with musculoskeletal disorders (Parreira et al., 2014).

Keeping in mind that KT applications can irritate patients' skin in some instances and may present with allergic reactions. Although adverse reactions were not observed in patients during the current study, such possibility must be confirmed before the widespread and routine use of taping therapy.

#### **CONCLUSION:**

Kinesio taping (KT) reduces postoperative sequelae following mandibular third molar surgery and is not technique sensitive and also free from undesired side effects and improves quality of patient's life . Further controlled studies are needed to compare the effectiveness of KT with other methods

#### **RECOMMENDATION/SCOPE OF FUTURE RESEARCH:**

Comparative ( split mouth ) and prospective studies with larger sample size are needed to define and to get a clarified idea regarding their clinical performance and relevant from the conventional method.

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