**Original Research**

# The Effect of Sutureless Surgery on Postoperative Pain and Swelling Following Mandibular Third Molar Surgery

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## Abstract

**Introduction:** surgeons have always sought to use techniques to decrease pain and swelling. One of the solutions that can minimize these complications is closing the wound with the minimum number of sutures or sutureless technique. The goal of this study was to evaluate the role of sutureless technique in decreasing pain and swelling after impacted mandibular third molar surgery. **Methods:** nineteen patients with bilaterally mandibular impacted third molars (one side as control and the other as the case) entered the study. A single surgeon performed the surgery using a single protocol. After removing each tooth, the flap on the control side was sutured, while on the study side, it was handled sutureless. Post-operative pain evaluated with visual analogue scale (VAS) at first, third and seventh days after surgery. Inflammation evaluated with measuring the distance between tragus and oral commissure in the same distance. **Result:** In our study, in all patients, the average mean pain score increased from the first to the third day and decreased from third to seventh day and the difference in the average of pain scores in the aforementioned three days was significantly different($p<0.001$).

In all patients, the mean score for swelling increased from the first to third day and decreased from the third to seventh day and its difference in the aforementioned three days was significant($p<0.001$).

The pain score was similar in two groups in the first day. However, this score was significantly less in the study group than the control group in the third and seventh day ($p<0.001$). **Conclusion:** Results of this study showed that secondary wound closure (sutureless technique) was effective in decreasing pain and swelling after mandibular third molar surgery

**Key words**: Mandibular impacted third molar, suture less, swelling, pain

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## Introduction

Extraction of impacted teeth is one of the most common operations in oral and maxillofacial surgery. Adjacent teeth and hard and soft tissue barriers are the most common reasons of impaction. As a principle, an impacted tooth must be extracted unless it causes undesirable side effects (1).

The most common impacted teeth are maxillary and mandibular third molars, maxillary canines and mandibular premolars. Since third molars erupt after other teeth, probable lack of space and impaction is more possible than others. The best extraction time is in 17-20 (1).

The side-effects of surgical extraction can be divided into immediate injuries and post-operative complications. Soft tissue trauma, trauma to the adjacent structure and extraction complications are some of the immediate injuries. Post operation complications include bleeding, dehiscence, infection and dry socket (1).

Since most patients avoid surgery because of complications like pain and edema, surgeons have always sought to use techniques to decrease these complications. Inflammation is one of the natural mechanisms of the human body to harm or cell death, which shows up with redness, heat, pain and swelling. A huge amount of inflammatory cytokines like histamine, bradykinin, serotonin and other chemical cytokines are released after a trauma. These chemical cytokines especially histamine, increase blood stream and permeability of vessels in the hurt area, which results in accumulation of exudates and pain and swelling (1).

There are some methods to facilitate the exudates drainage such as drain placement or partial suturing or sutureless technique.

## Materials and Methods

This study was an randomized clinical trial in which 19 referred patients to Mashhad dental faculty who had bilaterally impacted third molar with similar estimated removal difficulty entered the study. Exclusion criteria included presence of pathologic lesion in the area, soft tissue impaction and presence of any medical or psychological problem. The ethics committee approved the study design and ensured that consent was obtained from the patients.

A checklist was improvised with two parts; one for demographic information and medical history and the other for surgical information. In the demographic part age, sex and systemic diseases were recorded. In the surgical information pre-operation factors, the distance between tragus to oral commissure, was recorded. A 100mm scaled ruler was used as visual analogue scale (VAS) in which (0) denoted “no pain” and 100 meant “severe pain”. The investigator registered these data in the first, third and seventh days after operation. The same prescribed analgesic was used in equivalent sequences. Tragus to oral commissure distance was recorded using a flexible ruler in order to evaluate inflammation in the first, third and seventh day of surgery. First, patients received oral hygiene instruction and scaling and root planning. Then, all the patients underwent the surgery in same protocol: prep and drape was done. Lingual and inferior alveolar and long buccal nerves were anesthetized using 2%Lidocaine and 1:100000 epinephrine (Ultracaine; Dental forte;,Frankfurt/Main,Germany). After elevation of triangular mucoperiosteal flap, the bone was removed by round bur No.8 and fissure bur No.730 under constant irrigation with sterile normal saline. After extraction, curettage and cleansing was done using a 60ml sterile normal saline rinse. Control site sutured using 3.0 silk (fig. 1) but in study site the flap deflected to its own place for secondary wound healing (fig. 2). Sterile gauze pad, saturated with normal saline, was placed over the wound and patients received written and oral post-operative instructions and a prescription for medication. Cold compress was used immediately every 15 minutes to 5 hours. Ibuprophen (400mg tablets) four times daily and Amoxicillin (500mg capsules) three times daily were prescribed for five days to all patients. There was a one-month interval between the two operations (study and control site).

All patients were recalled to the dental department to evaluate the healing procedure, pain and swelling on the first, third and seventh days of surgery. All patients were advised to confer with dental department in case of severe and progressive pain in the first week after surgery. The data were analyzed statistically with paired t-test and performed using statistical package for social science (SPSS 8.0).

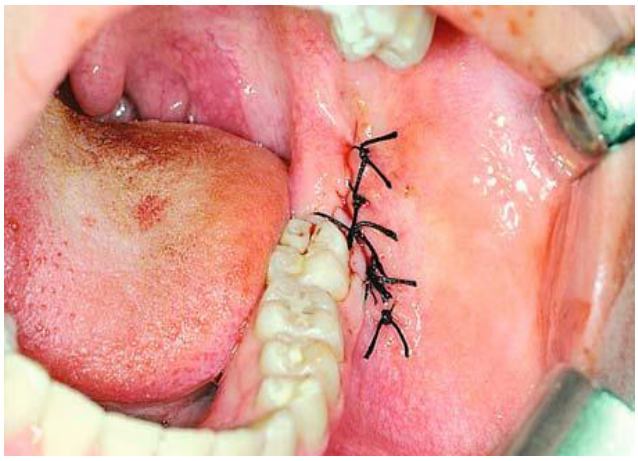

**Figure 1**. Suture in control side

**Figure 2**. Triangular incision in study side

## Results

19 healthy patients( 8male ,11female) with bilateral impacted teeth participated in this randomized clinical trial, by which the subjects served as their own control and their Pain and swelling was evaluated on the first, third and seventh days of operation. The mean age was 26.6±4.4 (range: 18 to 32).

There was no statistically significant difference in pain and swelling in both groups (p=0.16) on the first day but it was significantly lower in study group in the third and seventh days after surgery (p<0.001, p=0.001) (table1). The pain increased from the first to the third day and decreased from the third to the seventh day (figure 3) but its decrease was much greater in the study group (p<0.001). Swelling in control group increased between the first to the third day and decreased from the third to the seventh day but it was statistically significant (p=0.002)(figure 4). Swelling in the study group increased between the first to the third day but it decreased from the third to the seventh day and it was statistically significant (p<0.001). Pain from day 1 to 7 was not statistically different in both genders but swelling was much more in the male group (p<0.001).

**Table1**. Pain and swelling comparison between two groups

| **Number of patients =19** | | **Mean** | | | **SD** | | |
|---|---|---|---|---|---|---|---|
| | | Day1 | Day3 | Day7 | Day1 | Day3 | Day7 |
| Pain | control | 1.21 | 5.6 | 3.57 | 0.41 | 1.97 | 1.5 |
| | study | 1.10 | 4.2 | 2.68 | 0.31 | 1.58 | 1.10 |
| Swelling | control | 11.26 | 12.45 | 11.87 | 0.53 | 0.65 | 0.61 |
| | study | 11.30 | 12.09 | 11.55 | 0.53 | 0.62 | 0.54 |

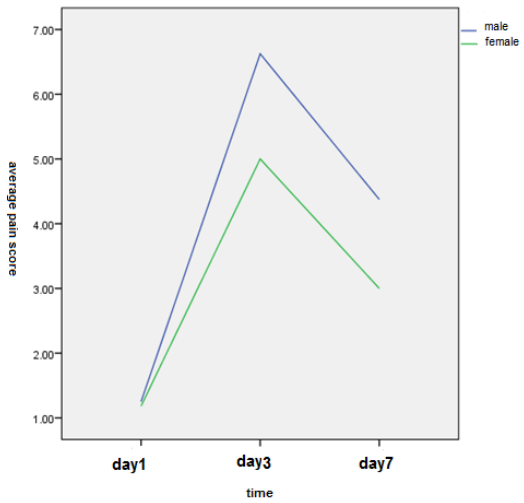


**Figure 3**. Average of pain score in control group

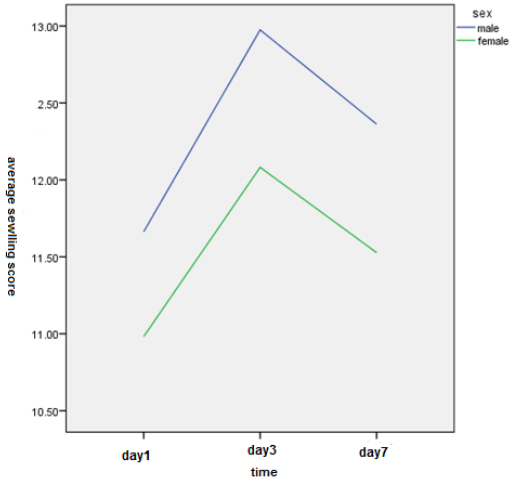


**Figure 4**. Average of swelling score in control group

## Discussion

One of the most frequent procedures in dental surgery is surgical removal of impacted mandibular third molar and it can lead to patient discomfort (2,3) . The etiology of post-operative complication mostly refers to surgical techniques especially suturing (4-8). The type of closure is the surgeon's choice (5).It seems that tight closure does not facilitate drainage and it turns the socket to a large hole with tiny valve traps debris or germs which leads to inflammatory procedures (4).The aim of this study was to evaluate pain and swelling after mandibular third molar surgery without suturing or sutureless techniques using the VAS method. VAS is considered more efficacious compared to MRI, 3-dimensional technology and laser scanning (9-11) . The surgeon's experience influences surgical outcomes (12). Therefore, this study was performed by a single surgeon with the same protocol. As inflammatory responses might vary among different individuals(2), the authors designed a split-mouth study.

Our study revealed post-operation pain and swelling decreased in the sutureless technique, compared to common suturing technique in extraction of impacted mandibular third molar. These results were confirmed by other studies, which used the sutureless technique (secondary intention) for impacted mandibular third molar surgeries.

Danda *et al.* showed pain and edema decreased in sutureless technique along with removing mucosa distal to mandibular second molar. These results agree with our findings except that all cases had same difficulty in removal in our study. Danda *et al.* measured external canthus to angle of mandible distance to evaluate swelling but we measured tragus to oral commissure distance(2).

This study confirms Pasquelini's research which revealed pain and swelling were higher in classic suture technique but only pain changes was statistically significant. He studied 200patients and randomly allocated them in two groups. He used VAS scale to evaluate pain swelling measured from the distance of mandibular angles using collies(6).

Our results were similar to some other studies. Hashemi *et al* showed pain and swelling in sutured site were more than control site. Pain was measured using VAS scale and external canthus to angle of mandible distance considered as swelling measurement(13).

Osunde revealed non-sutured cases experienced less pain and swelling in first and second day after surgery. In his study, pain and swelling had a statistically significant difference in the third and the seventh day of operation. Osunde *et al.* also showed trismus was lower in non-sutured groups(14). Some authors evaluated the effect of placing drain in order to decrease pain and swelling after impacted mandibular third molar surgery. These studies showed that using drain remarkably decreased pain and swelling (15-17).

Saglam used "Gabga and Maptomara" method to measure swelling which is a precise and multidimensional technique. In this method, external canthus to angle of mandible distance, tragus to oral commissure distance and Pogonion to tragus distance was measured and the mean distance was considered as swelling(17).

Ordulu *et al.* showed pain and swelling were statistically greater in males than females. In this study, male and female patients experienced the same amount of pain but swelling was statistically significant in male patients which confirms Carillogs's result(16).

## Conclusion and suggestion:

This research evaluated pain and swelling as post-operative complications. Our results revealed secondary wound healing (suture less) technique decreased pain and swelling on the third and the seventh day of operation and it was statistically significant. This technique helps patients feel more comfort and experience less complication. This research suggests paying attention to this method for future studies.

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