



## Effect of Primary VS Secondary Wound Closure Technique after Removal of Impacted Mandibular Third Molars on Post-Operative Sequelae and Incidence of Distal Caries in Second Molars Associated with Impacted Molars

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### Abstract

**Objective:** The surgical removal of impacted mandibular third molars is a common minor oral surgical procedure performed by dentists worldwide. This study aimed to compare the post-operative sequelae of impacted mandibular third molar surgery in relation to pain, swelling, trismus and wound healing after primary and secondary closure and also to note the incidence of distal caries in mandibular second molars associated with impacted third molars in 100 patients.

**Methods:** In this study, 100 patients (59 females and 41 males) within the age range of 24 - 35 years requiring surgical removal of impacted mandibular third molar teeth under local anesthesia were included.

All the patients were randomly divided into two equal groups: Group A - 50 patients who underwent primary closure in which the flap was repositioned and sutured in an interrupted pattern and Group B - 50 patients those who underwent secondary closure in whom a wedge of mucosa, width 5 - 6 mm was removed distal to second molar and the flap was repositioned and sutured. Criteria's assessed in the study were pain, swelling, trismus and wound healing.

Incidence of distal caries in mandibular second molar associated with an impacted third molar was also studied in all the patients.

**Results:** A significant difference was observed in swelling, pain, trismus and wound dehiscence at 1% level of significance. i.e.  $p < 0.01$  with more pain, swelling and trismus in primary healing group and greater dehiscence in secondary healing group. In this study, 39% cases had caries on distal aspect of mandibular second molar associated with the impacted third molars.

**Conclusion:** The result of our study suggests that secondary healing after surgical removal of impacted mandibular third molars may have considerable advantages over primary healing in terms of post-surgical quality of life, however multicentre studies are required to be conducted with a larger study sample. Distal caries in second molars associated with impacted mandibular third molars is common, especially in cases of mesioangular third molar impactions, thus periodic monitoring of all asymptomatic impacted third molars is necessary.

**Keywords:** Primary Healing; Secondary Healing; Third Molar Impaction

### Introduction

The surgical removal of impacted mandibular third molars is a common minor oral surgical procedure performed by dentists worldwide. Over the years various techniques have been experimented with for reducing the post-operative sequelae following the surgical removal of impacted teeth. Primary and secondary closure after removal of impacted mandibular third molars has been compared to check which had a better outcome in terms of post-operative quality of life [1,2]. This study aimed to Compare the post-operative sequelae of impacted mandibular third molar surgery in relation to pain, swelling, trismus and wound healing after primary and secondary closure in 100 patients.

### Materials and Method

In this study, 100 patients (59 females and 41 males) within the age range of 24 - 35 years requiring surgical removal of impacted mandibular third molar teeth under local anesthesia were included.

Inclusion criteria were unilateral, class 1 or 2, position A or B mandibular third molar impactions irrespective of their angulations which were free from any inflammation.

The exclusion criteria included class 3 impactions or position C type impactions. Medically compromised patients and pregnant females were also excluded from the study sample.

The patients were also prescribed Tab Tramadol to be taken in case of pain which was not controlled by the standard analgesic prescribed and such patients were excluded from the study sample and their number recorded.

All the patients were randomly divided into two equal groups: Group A and B

- Group A - 50 patients who underwent primary closure in which the flap was repositioned and sutured in an interrupted pattern
- Group B - 50 patients those who underwent secondary closure in whom a wedge of mucosa, width 5 - 6 mm was removed distal to second molar and the flap was repositioned and sutured.

**Surgical Protocol:** A common surgical protocol was followed for all the cases. The patient was asked to rinse the mouth with betadine prior to starting the surgical procedure. Local anesthesia was obtained by inferior alveolar, lingual and long buccal nerve block injections using 2% lignocaine with 1: 80,000 adrenalines. Wards

incision was placed in all the cases, full thickness mucoperiosteal flap raised, bone was removed by buccal guttering technique with burs and a clinical straight hand piece with saline irrigation, delivery of the tooth was accomplished and suturing done using 3 - 0 black braided silk suture. All the patients were prescribed Cap Amoxicillin 500 mg and Tab Ibuprofen 400 mg + Paracetamol 500 mg for 5 days, post-operative instructions were given and sutures were removed on the 7th post-operative day.

**Evaluation Criteria**

Criteria’s assessed in the study were pain, swelling, trismus and wound healing.

Patients recorded the degree of pain and swelling by VAS: Visual Analogic Scale themselves at home as our patents could report back only 7 days after the surgery for suture removal. The pain scale was 5 cm long, subdivided into five equal parts, one end corresponding to no pain, the other to extremely severe pain (Table 1) while the swelling scale was also 5 cm long with no swelling on one end and extremely severe swelling on the other (Table 2).

Number	Pain intensity	Patient experience
0	No pain	The patient feels well
1	Slight pain	If the patient is distracted he/she does not feel the pain
2	Mild pain	The patients feel pain even after concentrating on other activity
3	Severe pain	The patient is very disturbed but nevertheless can continue with normal activities
4	Very severe pain	The patient is forced to abandon normal activities
5	Extremely severe pain	The patient must abandon all the activity and feels the need to lie down

**Table 1:** VAS scale to evaluate Pain.

Number	Pain intensity	Patient experience
0	No swelling	The patient does not detect the slightest swelling
1	Slight swelling	The patient detects slight swelling but it is not very noticeable
2	Mild swelling	The swelling is noticeable but does not interfere with normal mastication and swallowing
3	Severe swelling	The swelling is evident and hinders normal mastication
4	Very severe swelling	The swelling is marked. Mastication is hindered but there is no reduction in mouth opening (no trismus)
5	Extremely severe swelling	The swelling is very evident and mouth opening is reduced (trismus)

**Table 2:** VAS scale to evaluate swelling.

Trismus was determined by measuring the inter-incisal distance using scales.

Wound healing was checked at the 7<sup>th</sup> post-operative day for dehiscence.

A comparison was made in all the above criterions in between the preoperative measurements and subsequent 6 hours, day 2, day 4 and day 7 post-operative measurements.

The second molars were examined clinically and radiographically and the number of carious teeth associated with the impacted teeth noted along with the type of impaction.

**Statistical Method**

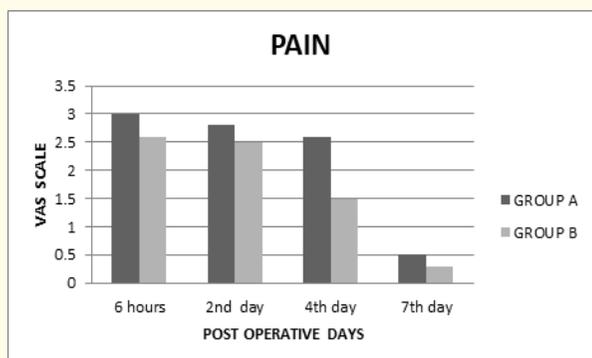
The comparisons between the two groups were made by applying the unpaired “t” test and obtaining “t” value at 1% level of significance with P < 0.01 being considered statistically significant.

**Result**

A significant difference was observed in swelling, pain and wound dehiscence at 1% level of significance. i.e. p < 0.01.

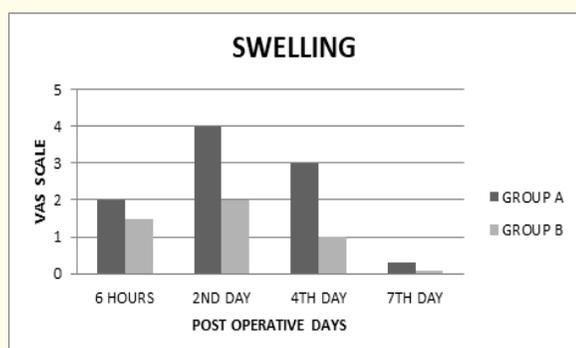
**Pain:** Results for the pain 6 hours and 2<sup>nd</sup> day postoperative period showed peak level of pain in both groups with more pain in Group-A as compared to Group-B but the difference was not sta-

tistically significant. On the day 4 the pain perceived by the Group-A was more from the Group-B which was statistically significant. On day 7 the pain perceived was minimal in both the groups and was comparatively not statistically significant (Graph 1).



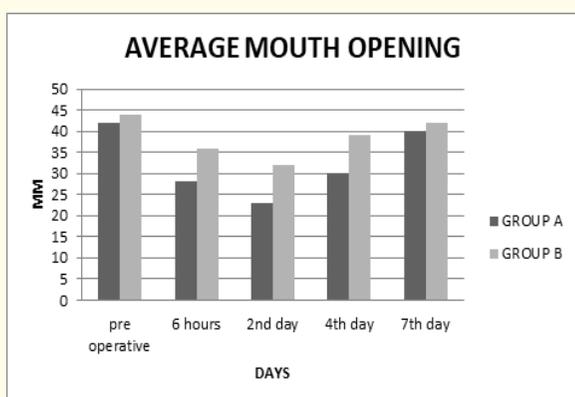
Graph 1: Pain.

**Swelling:** There was a statistically significant difference in swelling between the two groups. Group A showed statistically significantly more swelling as compared to Group B throughout the week in which the swelling reached its peak level on 2<sup>nd</sup> day and then decreased gradually by 7<sup>th</sup> day (Graph 2).



Graph 2: Swelling.

**Trismus:** There was a significant difference in trismus between the two groups at all times with more trismus in Group A (Graph 3).



Graph 3: Mouth opening.

Dehiscence of the wound with food lodgement was observed in 3 patients of Group- A in comparison to 37 patients in Group-B.

22 patients from group A and 8 patients from group B took an additional analgesic (Tab Tramadol) to control pain. All these patients were excluded from the study.

In this study, 39% cases had caries on distal aspect of mandibular second molar.

Out of the 45 mesioangular impacted third molars 21 had caries in the distal aspect of second molars. Majority of these mesioangular cases were level B and Class I as per Pell and Gregory Classification. Distal caries found in association with horizontal impactions was 7 out of the 28 impacted molars and in distoangular impactions 11 out of the 24 impacted molars had caries. In our study, no caries was found in relation to the 03 vertical impactions.

It was concluded that distal caries in second molars is common, especially in cases of mesioangular mandibular third molar impactions thus periodic close monitoring of all asymptomatic impacted third molars is necessary.



Figure 1: Primary Closure.



Figure 2: Secondary Closure.

## Discussion

Third molars are the last teeth to erupt in the oral cavity and therefore are among the most commonly impacted teeth.

One of the indication for removal of an asymptomatic impacted third molar is caries in the second and third molar caused due to the partially erupted mesioangular impacted mandibular third molars that contact the amelocemental junction of the second molar placing this tooth are at risk of developing caries in the distal cervical region. Thus, all impacted teeth should be kept under observation and if there is food lodgement and initiation of caries process extraction should be done. Surgical extraction of impacted mandibular teeth is accompanied by postoperative pain, swelling and trismus. Pain is caused by the release of chemical mediators of inflammation such as bradykinin and prostaglandin, while swelling is caused by accumulation of fluid exudates in the interstitial tissue spaces. Various techniques have been tried to improve the quality of life in the post-operative healing period by attempting to reduce the post-operative swelling and pain like the placement of surgical drains, use of steroids, use of various medications prior to and after surgery and primary vs. secondary closure following surgical extraction [1-5]. In this study primary and secondary closure were compared as it is not clear by previous studies which is better with some studies favouring the primary closure while other the secondary. In primary closure site, the wound was sealed closed and therefore the advantage was that it healed more rapidly while the secondary closure appears to minimize immediate post-operative oedema and pain due to leaching out of inflammatory products and thus enhances patient's comfort. The post-operative care and hygiene of a secondary closure site is more easily managed. In our study, pain and swelling were measured with VAS score as patient follow up was difficult on 2<sup>nd</sup> and 4<sup>th</sup> day due to work related commitments. Our result revealed that the swelling was significantly lower in the secondary healing group throughout the healing phase which is in accordance with previous studies. However, some studies conclude that swelling was reduced in the secondary healing group only in the immediate post op period. The pain levels were similar till the 2<sup>nd</sup> day but there was a significant reduction in pain after the 3<sup>rd</sup> day in the secondary healing group. Trismus was significantly more in the primary healing group. At 7 days postoperatively, the chemical mediators are cleared from the area of inflammation thus no significant differences were observed between primary closure technique and secondary closure technique was recorded. The only major disadvantage in the secondary closure group was the longer healing time of the surgical area causing anxiousness to our patients. One limitation of our study was the use of VAS scale to have the swelling measured by the patients themselves on a scale from 1 to 5. Different individuals have different interpretations of the same so the result was relative.

## Conclusion

The result of our study suggests that secondary healing after surgical removal of impacted mandibular third molars may have considerable advantages over primary healing in terms of post-surgical quality of life, however multicentre studies are required to be conducted with a larger study sample. Distal caries in second molars associated with impacted mandibular third molars is common, especially in cases of mesioangular third molar impactions, thus periodic monitoring of all asymptomatic impacted third molars is necessary.

## Ethical Approval

Yes.

## Conflict of Interest

Nil.

## Acknowledgment

Nil.

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