

# A Comparative Study of Sutureless and One Suture Techniques Following Third Molar Surgery

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## ABSTRACT

**Background:** Minimizing post-operative complications following lower third molar surgery is a key component of patient care. Modification of the wound closure technique is one of these simple measures which have a crucial effect on the post-operative course, in patients undergoing lower third molar surgery. This study aims to determine which of the two secondary closure techniques assessed is superior in improving wound healing, and reducing post-operative complications, following lower third molar surgery.

**Material & Methods:** A prospective, randomized, cross-over clinical trial was conducted in department of oral & maxillofacial surgery in Mahatma Gandhi Dental College Jaipur, Rajasthan. We compared partial closure using one suture to the suture-less technique. Surgical sites were divided into two groups, Group A: one suture, and Group B: suture-less. Each patient received both treatments at the same time. During the first post-operative week, all patients were asked to daily assess pain, trismus & facial swelling using subjective self-assessment scales.

**Results:** Our study showed that the age interval ranged from 18 to 44 years with an average age of 25.2 years. The results demonstrated that post-operative pain and wound healing are

influenced by the type of the closure technique used by the surgeon.

**Conclusion:** We concluded that that the placement of one suture, distal to the lower second molar, after raising a small buccal envelope flap (Stassen modification) for lower third molar surgery, is superior to the suture-less technique, in decreasing postoperative pain and enhancing wound healing.

**Keywords:** Third Molar Surgery, Pain, Swelling, Trismus, Suture-Less Technique, Suture Technique.

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## INTRODUCTION

Lower third molar surgery remains one of the most common surgical procedure in oral and maxillofacial surgery.<sup>1,2</sup> It has its own risks, and post-operative complications, that influence the recovery period, and affect a patient's quality of life. It has been suggested that wound closure technique is an operative factor that influences early post-operative complications, after lower third molar surgery.<sup>3,4</sup> Pain, swelling and trismus are considered as immediate postoperative tissue reactions following third molar surgery and they have been commonly related with the length of the surgical intervention, the surgical difficulty and operative trauma. In some cases, complications can occur, which are unwanted reactions that may not necessarily follow the surgical procedure, including: bleeding or haemorrhage<sup>5</sup>, postoperative infections like dry socket<sup>6</sup>, nerve injury, delayed healing and the creation of a periodontal pocket in the distal aspect of the adjacent second molar.<sup>7,8</sup> Primary and secondary closure are used for the wound management after extraction of impacted lower third molars. Some of them compare these variables by means of using

different suture techniques<sup>5,9,10</sup>, different type of flaps<sup>3,8</sup> and even with the use of tube drains.<sup>11,12</sup> This study aims to determine which of the two secondary closure techniques assessed is superior in improving wound healing, and reducing post-operative complications, following lower third molar surgery.

## MATERIALS & METHODS

A prospective, randomized, cross-over clinical trial was conducted in department of oral & maxillofacial surgery in Mahatma Gandhi Dental College Jaipur, Rajasthan. We compared partial closure using one suture to the suture-less technique. Surgical sites were divided into two groups, Group A: one suture, and Group B: suture-less. Each patient received both treatments at the same time. During the first post-operative week, all patients were asked to daily assess pain, trismus & facial swelling using subjective self-assessment scales. All patients attended follow-up appointment at one week, to objectively assess facial swelling and wound healing, and at one month, to assess wound healing.

**Inclusion Criteria**

1. Patients with an indication for extraction of both lower third molars with a symmetrical grade of impaction assessed using the Pell and Gregory classification
2. Healthy patients (ASA I) or patients with systemic mild disease with no functional limitations (ASA II) and with no objective contraindication for surgical procedure
3. Age range: 18-45 years
4. Patient willing to participate in the study that completes follow-up visits and signed informed consent for treatment.

**Exclusion Criteria**

1. Patients with systemic diseases ASA III, ASA IV and ASA V
2. Patients using antibiotic premedication or using medication that would affect wound healing.
3. Acute pericoronaritis or severe periodontal disease
4. Patients allergic to the drugs or local anesthesia used in the study.
5. Patients undergoing more than one extraction during the same surgical procedure.

**Surgical Protocol**

Surgical extraction was done under local anesthesia, using a 4% lidocaine (1:100,000 epinephrine) anesthetic solution (Artinibsa®, Inibsa, Barcelona, Spain). A crestal incision with a relieving incision at mesial part of the adjacent second molar that crossed the mucogingival line, with a length equal or greater than 10 mm, was performed. The mucoperiosteal flap was raised and ostectomy was performed using low-speed hand pieces (maximum 40,000 rpm) and a number 8 tungsten carbide bur. Curettage and irrigation of the surgical bed was performed using sterile distilled water. Sutures were done with 3-0 silk with a C16 needle.

The suture technique in test group was consisted in one suture knot tied at the corner of the triangular flap and hermetic suture at the distal aspect of the adjacent second molar. On the contrary, a hermetic suture of distal and relieving incisions of the triangular flap was made in control group. Finally, patient was instructed to bite on sterile gauze for 30 minutes. All patients were given written information regarding to postoperative instructions and medication

**Table 1: Pain intensity at 48 hours and at 7 days after surgery in the test and control groups.**

Pain	Test group (Suture group)	Control Group (Suture less group)	P-value
48 hrs	4.65±2.08	4.52±1.97	0.417
7 days	2.65±1.89	3.74±2.11	0.034**

**Table 2: Trismus present at 48 hours and at 7 days after surgery in the test and control groups.**

Trismus	Test group (Suture group)	Control Group (Suture less group)
48 hrs	25	30
7 days	3	10

**Table 3: Facial swelling at 48 hours and at 7 days after surgery in the test and control groups.**

Facial swelling	Test group (Suture group)	Control Group (Suture less group)	P-value
48 hrs	2.75±1.357	2.44±1.299	0.183
7 days	0.828±0.857	0.742±0.852	0.397

**Table 4: Soft tissue healing after surgery in the test and control groups.**

Soft tissue healing	Test group (Suture group)	Control Group (Suture less group)
Excellent	22	13
Very Good	5	5
Good	3	1
Poor	5	16

**RESULTS**

Our study showed that the age interval ranged from 18 to 44 years with an average age of 25.2 years. No statistically significant differences were found to be related to pain ( $p < 0.06$ ) at 48 hours but after 7 days the pain was statistical significant ( $P < 0.05$ ), although pain scores were greater in the complete closure than in the partial closure. There were no significant differences for trismus between none of them by measuring the mouth opening ( $p < 0.71$ ) at 48 hours and at 7 days after surgery.

There were no differences in facial swelling between the sutured and non-sutured sides at at 48 hours and at 7 days ( $p > 0.05$ ). The soft tissue healing was excellent in test group as compared to control group after one month period.

**DISCUSSION**

As for any other surgical procedures, lower third molar surgery has its own risks and post-operative complications, that influence the recovery period and affect the patient's quality of life.<sup>13,14</sup> Pain, limitation of mouth opening, and clinical evidence of swelling have a significant effect on the oral health related quality of life during the immediate post-operative period following lower third molar surgery.<sup>15</sup>

Wound healing after lower third molar surgery has a significant clinical importance for the clinician, as delayed healing and wound dehiscence make hygiene more difficult and may require intense follow-up treatment, which potentially extends the time of postsurgical treatment. From the patient's point of view, delayed

healing could result in a longer period of discomfort and continuous pain which is caused by hypersensitivity in the exposed distal root surface of the adjacent second molar.<sup>16</sup>

“Pain is entirely subjective and its links with pathology are indirect, the only way to successfully assess pain is to believe the patient. Pain is what the patient says it is”.<sup>17</sup>

In this study, there are not statistically significant differences for trismus, pain and swelling, comparing both type of sutures. However, these variables are lower for the partial closure technique.

A study similar to ours conducted by Osunde et al.<sup>18</sup> evaluated the role of the suture technique in relation to postoperative complications and concluded that there were no significant differences between the complete closure and a one-knot in the corner of the flap, although the group with partial closure presented a reduction in postoperative variables (pain, swelling and trismus). Likewise, Maria et al.<sup>19</sup> found a lower level of postoperative variables in the group with a secondary closure, as well as greater level of edema and the presence of hematoma in the group with a complete closure.

Other authors<sup>4,9</sup> have evaluated the secondary closure of the wound without sutures obtaining slightly different results. Waite and Cherala<sup>9</sup> studied the outcome from not suturing a small “V” shaped flap in 1280 extracted molars from 366 patients and obtained satisfactory results in terms of postoperative complications. Conversely, Osunde et al.<sup>20</sup> performed a study comparing the effect from suturing with not suturing and they found a reduction in the severity of pain at the first and second days in the group with no sutures, although at the seventh day the results were equal to the suture group. They did not report differences regarding postoperative swelling and trismus between groups. Contrary to the last, a similar study published by Hashemi et al.<sup>4</sup> reported lower scores of pain and swelling in the group without suture. The benefits from a no suture technique are the lower cost, less operative time, less manipulation of soft tissue and hence, less postoperative morbidity.<sup>9,20</sup> Distinct authors<sup>3,20</sup> suggest that the creation of a drainage pathway for inflammatory exudate helps to reduce symptoms and postoperative complications.

Total wound closure can act as a one-way valve that permits food debris to enter the socket but does not allow it to escape. This predisposes to local infection, inflammation, edema and pain.<sup>6,7,9</sup> The main drawback of suture-less is that healing may be delayed. In addition, there may be high potential for the formation of a periodontal pocket in relation to the adjacent second molar<sup>20</sup>. However, a recent meta analysis<sup>21</sup> concludes that there are no significant differences on the outcome between complete and partial wound closure and it also refers that the available studies are heterogeneous and do not produce high level of scientific evidence.

## CONCLUSION

The results demonstrated that post-operative pain and wound healing are influenced by the type of the closure technique used by the surgeon. We concluded that the placement of one suture, distal to the lower second molar, after raising a small buccal envelope flap (Stassen modification) for lower third molar surgery, is superior to the suture-less technique, in decreasing postoperative pain and enhancing wound healing.

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