

# Primary closure after surgical extraction of mandibular third molar with or without tube drain: A prospective study

Vishal<sup>1</sup>, Tanya Khaitan<sup>2</sup>, Rajeev Ranjan<sup>3</sup>, Nitesh Sharma<sup>4</sup>

<sup>1</sup>Departments of Oral and Maxillofacial Surgery, <sup>2</sup>Oral Medicine and Radiology, Dental Institute, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, <sup>3</sup>Department of Pedodontics and Preventive Dentistry, Awadh Dental College and Hospital, Jamshedpur, Jharkhand, <sup>4</sup>Department of Prosthodontics and Crown and Bridge, Rungta College of Dental Sciences and Research, Bhilai, Chhattisgarh, India

## ABSTRACT

**Introduction:** The surgical removal of impacted third molars is considered one of the most frequent procedures in oral and maxillofacial surgery. The utilization of drain is suggested for the reduction of postoperative complications, because it permits the drainage of the fluids located in the tissue spaces. **Material and Methods:** A prospective randomized clinical study was conducted with 30 patients each in two groups undergoing surgical extraction of mandibular third molars with and without drain. For the group with drain, a small no. 8 size rubber drain was used. Patients were evaluated for postoperative pain, swelling, and trismus. **Result:** The trismus was greater (highly significant with  $P < 0.001$ ) on the first, third, and seventh postoperative days in the control group. When swelling was being evaluated, highly significant statistical difference was observed between the two groups on the first and third postoperative days ( $P < 0.001$ ), but on the seventh postoperative day, there was no statistical significance ( $P > 0.05$ ). On comparison of postoperative pain, there was no statistically significant difference between any follow up days. **Conclusion:** Use of tube drain is effective in reducing the postoperative discomfort in terms of pain, swelling and trismus after surgical removal of impacted mandibular third molar.

**Keywords:** Drain, impaction, third molars

## Introduction

The surgical removal of impacted third molars is considered one of the most frequent procedures in oral and maxillofacial surgery.<sup>[1]</sup> Removal of an impacted lower third molar causes pain, swelling and difficulty in opening the mouth (trismus).<sup>[2]</sup> The frequency of such postoperative problems is related to the type of wound closure, type of suturing technique, and the length of

the surgical intervention.<sup>[1,3]</sup> The utilization of drain is suggested for the reduction of postoperative complications.

Placement of surgical drains, both intraorally and extraorally, is a common technique carried out in oral and maxillofacial surgery. Drains are used to evacuate pus, pooled blood or serum from wounds as well as to eliminate potential dead tissue space. There are three classes of drains commonly used: gauze drains, simple rubber drains and suction drains.<sup>[4]</sup> The use of drain allows the patient to experience a more comfortable postoperative period in relation to the pain, swelling and trismus, because it permits the drainage of the fluids located in the tissue spaces.<sup>[1]</sup>

**Address for correspondence:** Dr. Tanya Khaitan,  
Department of Oral Medicine and Radiology, Dental  
Institute, Rajendra Institute of Medical Sciences, Ranchi,  
Jharkhand - 834 009, India.  
E-mail: tanyakhaitan@gmail.com

Received: 13-12-2019

Revised: 10-01-2020

Accepted: 21-01-2020

Published: 28-02-2020

### Access this article online

#### Quick Response Code:



Website:  
www.jfmpc.com

DOI:  
10.4103/jfmpc.jfmpc\_1144\_19

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

**How to cite this article:** Vishal, Khaitan T, Ranjan R, Sharma N. Primary closure after surgical extraction of mandibular third molar with or without tube drain: A prospective study. J Family Med Prim Care 2020;9:637-41.

The present study was undertaken to compare the effect of using tube drain before primary closure with that of primary closure alone, on postoperative pain, trismus and swelling after the removal of impacted mandibular third molars.

## Material and Methods

A prospective randomized experimental clinical study was conducted after approval obtained from the institutional ethical committee. All the patients with complaint of impacted mandibular 3<sup>rd</sup> molars attending the department of Oral and Maxillofacial surgery, Teerthanker Mahaveer Dental College and Hospital, Moradabad from the time period June 2012 to December 2014 were included in the study. Pregnant women, patients with signs of pericoronitis, oral submucosal fibrosis and periapical pathologies were excluded. The study group included 60 patients aged 18 to 40 years (32 males and 28 females) who underwent the surgical removal of impacted lower third molars. The importance of the study was explained to all the participants and informed consent taken. A preoperative assessment including WAR assessment, winter's classification and degree of difficulty during tooth removal was carried out and recorded. OPG were taken for all the cases. The study participants (60 patients) were selected randomly and categorized into two groups: experimental group (with tube drain, n = 30) and control group (primary closure, n = 30). No. 8 infant feeding tube was used as a drain tube. The length and internal diameter of the surgical tube drain was 4 cm and 3 mm, respectively.

## Procedure

The patients were given an inferior alveolar nerve block, lingual nerve block, and a long buccal nerve block using 1.8 ml of 2% Lignocaine hydrochloride with vasoconstrictor Adrenaline concentration 1:80,000 appropriately. A mucoperiosteal flap was reflected following standard Terrance Ward's incision. The flap was reflected and the overlying bone covering the crown of the impacted tooth was removed using 701 straight fissure burs in a straight micro-motor hand piece in conjunction with constant irrigation with normal saline. Tooth section was done when needed. Following removal of the impacted tooth bony socket was irrigated with Betadine and normal saline solution.

In the control group, the flap was approximated without tension. This was achieved by placing three to four simple interrupted sutures using 3-0 black braided silk. In the experimental group, after suturing a small surgical tube drain was inserted into the socket via a stab incision in the buccal fold between the first and second molars and left for 3 days.

All the patients were given postoperative instructions and advised to be on soft diet for the first 24 hours. In the postoperative period, the patients were prescribed amoxicillin 500 mg thrice daily and Ibuprofen 400 mg and Paracetamol 500 TDS for 3 days.

## Postoperative evaluation

Patients were examined immediately preoperatively and on the first, third, and seventh postoperative days. Pain was evaluated and recorded in the postoperative period via visual analog scale (1 to 10). The maximum mouth opening was determined using a divider, measuring the distance between the incisal edges of the upper and lower central incisors. Facial swelling was measured using a measuring tape as shown in the Figure 1. The horizontal measurement corresponds to the distance between the corners of the mouth to the attachment of the ear lobe following the bulge of the cheek. The vertical measurement corresponds to the distance between the outer canthus of the eye to the angle of the mandible. The percentage of facial swelling was obtained from the below formula:

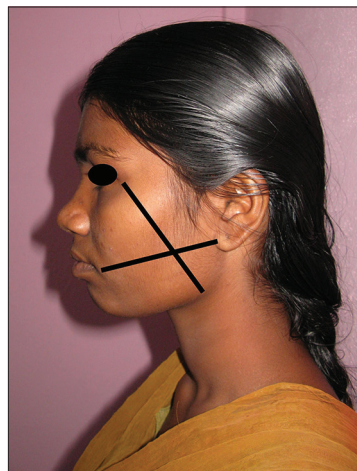
$$\frac{\text{Postoperative value} - \text{preoperative value}}{\text{Preoperative value}} \times 100 = \% \text{ of facial swelling.}$$

All the patients were treated by the different surgeons and observed by the same surgeon preoperatively and on 1<sup>st</sup>, 3<sup>rd</sup>, and 7<sup>th</sup> day, postoperatively. The surgical tube drain was removed on the 3<sup>rd</sup> postoperative day and the sutures were removed on the 7<sup>th</sup> postoperative day.

All the data obtained were recorded in a proforma specially designed for the study and subjected to statistical analysis. Student's *t*-test was performed for evaluation of swelling and mouth opening. Pain was analyzed using Wilcoxon test and mouth opening was evaluated using Student's unpaired *t*-test. Statistical significance was considered at *P* value < 0.01.

## Results

A prospective, randomized, experimental clinical study was conducted to determine the effect of using a tube drain on postoperative variables such as pain, swelling and trismus which occur after the impacted lower third molar surgery. Majority of the patients were between 19 and 24 (64%) years in both the



**Figure 1:** Landmarks used for measurement of facial swelling

groups. Experimental group comprised of 18 males and 12 females whereas control group had 14 males and 16 females.

It was noted that the trismus was greater on the first, third, and seventh postoperative days in the control group compared to the experimental group. On comparison of both the techniques, there were statistically highly significant difference on the first, third, and seventh postoperative days ( $P < 0.001$ ) [Table 1]. When swelling was being evaluated, highly significant statistical difference was observed between the two groups on the first and third postoperative days ( $P < 0.001$ ), but on the seventh postoperative day, there was no statistically significant ( $P > 0.05$ ) [Table 2].

Table 3 shows that the pain was at high frequency on the first postoperative day and gradually diminished after 3 days and 7 days. There was no statistically significant difference on first, third and seventh postoperative days between both the groups ( $P > 0.05$ ).

### Discussion

Transalveolar extraction of mandibular third molar is the most frequent procedure performed in oral and maxillofacial surgery. Postoperative facial swelling is common after extraction of third molars. According to Sortino and Cicciù, the intra-operative

strategies responsible for the swelling have not been analyzed. Surgical flaps do not seem to be a major cause and piezo-surgery has not been used extensively enough to suggest that it can help to control it.<sup>[5]</sup>

Although there is a diversity of opinion among the surgeons regarding wound closure technique following the removal of impacted mandibular third molars, primary closure is being advocated by most of them.<sup>[5-8]</sup> Some suggest to let the wound heal by secondary intention and use of drain.<sup>[9,10]</sup> The use of a small surgical tube drain following third molar surgery reduces the postoperative complications effectively.<sup>[3,11]</sup> Cerqueira *et al.* hypothesized that a tube drain allows the patient to experience a more comfortable postoperative period in relation to the pain, swelling and trismus because it permits the drainage of the fluids collected in the tissue spaces.<sup>[1]</sup> A drain soaked in tetracycline hydrochloride is also used in the impacted third molar surgery to minimize the postoperative discomfort.<sup>[12]</sup> Earlier, many clinicians have been using rubber drain with ranging degree of success for evacuation of pooled blood and elimination of dead space in wounds.<sup>[11]</sup>

Prostaglandin E2, bradykinin, histamine and serotonin are the important mediators of pain which are released following surgical removal of third molars. More extensive the surgery, more substances are released, thus causing more inflammation. Following the surgical removal of impacted mandibular third molars, pain gradually starts as the effects of local anesthetic agent subside. The pain is usually moderate to severe during the first day in which peak intensity is about 6–8 hours, postoperatively. The pain then gradually disappears in the course of few days, provided if normal healing occurs.<sup>[13]</sup> In the present study, pain was evaluated using a visual analog scale. Pain was observed at high intensity on the first postoperative day and gradually diminished after three days and on the seventh day postoperatively. Similar results were observed in other studies.<sup>[13]</sup> Our study showed that there was no much statistical difference in the intensity of pain in both the groups, although pain was slightly less severe in the experimental group.

Swelling and trismus after third molar surgery is significantly greater at primary closure sites, mainly due to accumulation of hematoma following surgical trauma.<sup>[14]</sup> The relationship of time of swelling subsequent to mandibular third molar surgery has been examined by a few. Literature reveals that the development of swelling started shortly after the surgery and reached a maximum after 36–40 hours.<sup>[8,15-17]</sup>

Evaluation of facial swelling using craniometrical points revealed that the swelling was maximum on the third postoperative day in the control group and gradually decreased thereafter reaching near normal on the seventh postoperative day. While comparing both the techniques, it was revealed that the mean value of the facial swelling was highly statistically significant ( $P < 0.001$ ) on first and third postoperative days. Our results were consistent with various studies.<sup>[1,3,11]</sup>

**Table 1: Descriptive statistics of mouth opening of the experimental and control groups**

Max mouth opening (mm)	Experimental group		Control group	
	Mean	SD	Mean	SD
Pre operative	39.16	4.78	40.88	2.95
1 <sup>st</sup> Day	31.2	5.16	29.48	4.10
3 <sup>rd</sup> Day	33.76	5.24	31.2	4.20
7 <sup>th</sup> Day	36.92	4.67	36.04	3.22

NOTE: SD=Standard Deviation

**Table 2: Descriptive statistics of swelling of the experimental and control groups**

Swelling	Experimental group		Control group	
	Mean	SD	Mean	SD
1 <sup>st</sup> Day	2.85	0.76	5.39	1.54
3 <sup>rd</sup> Day	4.34	0.67	7.65	1.86
7 <sup>th</sup> Day	1.68	0.64	2.00	1.73

NOTE: SD=Standard Deviation

**Table 3: Descriptive statistics of pain of the experimental and control groups**

Pain	Experimental group			Control group		
	Mean	SD	Median	Mean	SD	Median
Pre operative	0	0	0	0	0	0
1 <sup>st</sup> Day	3.52	0.87	4	3.6	0.81	4
3 <sup>rd</sup> Day	2.48	0.87	2	2.24	0.66	2
7 <sup>th</sup> Day	0.16	0.55	0	0.16	0.55	0

NOTE: SD=Standard deviation

While analyzing the mouth opening, there was statistically highly significant difference between the two groups on the first, third, and seventh postoperative days. Similar results were observed in a study where, the trismus was found to be a statistically significant difference between the two groups on 3<sup>rd</sup> and 7<sup>th</sup> postoperative days.<sup>[3]</sup>

Previous studies suggest that trismus developed more slowly than swelling, reaching maximum after 2–3 days.<sup>[17-19]</sup> Rakprasitkul S *et al.* (1997) suggested that the trismus reached peak on the 3<sup>rd</sup> postoperative day in both drain and no drain groups.<sup>[3]</sup> Cerqueira PR *et al.* (2004) and Saglam AA (2003) noted that there was no statistically significant difference on any postoperative days.<sup>[11,11]</sup> In our study, the degree of trismus was significant in the control group when compared to the experimental group. Additionally, less postoperative swelling was found in the experimental group than the control group. Similar results were noted in various studies conducted by the authors.<sup>[3,11,20-23]</sup>

Third molar impaction is minor oral surgical procedure performed routinely. Age groups generally undergoing these procedures are in the second and third decades mostly including students or newly earning professionals. It is done on outpatient basis and the patients expect to get a prompt and painless recovery.<sup>[24]</sup> Although, it is often seen even after a week of surgery, the patient returns with post-operative complications which make both the patient and their family members worried. Our study focuses on a simple primary care i.e. adding a tube drain which significantly reduces post-operative discomfort and complications and pleases the patient soon. Overall results of the present study showed that use of tube drain is effective in reducing the postoperative discomfort in terms of pain, swelling and trismus after surgical removal of impacted mandibular third molar.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

### Financial support and sponsorship

Nil.

### Conflict of interest

There is no conflict of interest.

## References

- Cerqueira PR, Belmiro C, Ricardo V. Comparative study of the effect of a tube drain in impacted lower third molar surgery. *J Oral Maxillofac Surg* 2004;62:57-61.
- Garcia AG, Sampedro FG, Rey JG, Torreira MG. Trismus and pain after removal of impacted lower third molars. *J Oral Maxillofac Surg* 1997;55:1223-6.
- Rakprasitkul S, Pairuchvej V. Mandibular third molar surgery with primary closure and tube drain. *Int J Oral Maxillofac Surg* 1997;26:187-90.
- Flynn TR, Hoekstra CW, Lawrence FR. The use of drains in oral and maxillofacial surgery: A review and a new approach. *J Oral Maxillofac Surg* 1983;41:508-11.
- Archer WH. *Oral and Maxillofacial Surgery*. 5<sup>th</sup> ed. Philadelphia, WB Saunders Co.; 1975.
- Howe GL. *Minor Oral Surgery*. Bristol, England, Johns Wright and Sons Ltd; 1976. p. 62-6.
- Kruger GO, editor. *Textbook of Oral Surgery*. St Louis MO: CV Mosby Co; 1984. p. 77-95.
- Thoma KH. *Oral Surgery*. 5<sup>th</sup> ed, vol 1. St Louis: CV Mosby Co.; 1969.
- Killey HC, Kay LW. *The Impacted Wisdom Tooth*. 2<sup>nd</sup> ed, London: Churchill Livingstone Co.; 1975.
- Blair VP, Ivy RH. *Essentials of Oral Surgery*. St Louis: CV Mosby Co.; 1923.
- Saglam AA. Effects of tube drain with primary closure technique on postoperative trismus and swelling after removal of fully impacted mandibular third molars. *Quintessence Int* 2003;34:143-7.
- Akota I, Alvsaker B, Bjornland T. The effect of locally applied gauze drain impregnated with chlortetracycline ointment in mandibular third molar surgery. *Acta Odontol Scand* 1998;56:25-9.
- Seymour RA, Walton JG. Pain control after third molar surgery. *Int J Oral Surg* 1984;13:457-85.
- Dubois DD, Pizer ME, Chinnis RJ. Comparison of primary and secondary closure techniques after removal of impacted mandibular third molars. *J Oral Maxillofac Surg* 1982;11:631-4.
- Milles M, Desjardins PJ. Reduction of postoperative facial swelling by low-dose methylprednisolone. An experimental study. *J Oral Maxillofac Surg* 1993;51:987-91.
- Schultze-Mosgau S, Schmelzeisen R, Frolich JC, Schmele H. Use of ibuprofen and methylprednisolone for the prevention of pain and swelling after removal of impacted third molars. *J Oral Maxillofac Surg* 1995; 53:2-7.
- Van Gool AV, Ten Bosch JJ, Boering G. Clinical consequences of complaints and complications after removal of mandibular third molar. *Int J Oral Surg* 1977;6:29-37.
- Neupert EA, Lee JW, Philput CB, Gordon JR. Evaluation of dexamethasone for reduction of postsurgical sequelae of third molar removal. *J Oral Maxillofac Surg* 1992;50:1177-82.
- Deliverska EG, Petkova M. Complications after extraction of impacted third molars- literature review. *J IMAB* 2016;22:1202-11.
- Genc A, Cakarar S, Yalcin BK, Kilic BB, Isler SC, Keskin C. A comparative study of surgical drain placement and the use of kinesiological tape to reduce postoperative morbidity after third molar surgery. *Clin Oral Invest* 2019;23:345-50.
- Liu S, You Z, Ma C, Wang Y, Zhao H. Effectiveness of drainage in mandibular third molar surgery: A systematic review and meta-analysis. *J Oral Maxillofac Surg* 2018;76:1640-50.
- Abhishek Handa, Khalid Mohammed Agwani. Effects of tube drain with primary closure techniques on postoperative trismus and swelling after removal of impacted mandibular

- third molars. IOSR J Dent Med Sci 2016;15:92-10.
23. de Barbander EC, Cattaneo G. The effects of surgical drain together with a secondary closure technique on postoperative trismus, swelling and pain after mandibular third molar surgery. Int J Oral Maxillofac Surg 1988;17:119-21.
24. Neogi D Suhas, Malhotra R, Kumar V. Pain: Assessment and measurement. Orthopaedics Today 2008;10:14-20.