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 statistically 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
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 3rd 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:

\[
\text{Postoperative value} - \text{preoperative value} \times 100 = \% \text{ of facial swelling.}
\]

All the patients were treated by the different surgeons and observed by the same surgeon preoperatively and on 1st, 3rd, and 7th day, postoperatively. The surgical tube drain was removed on the 3rd postoperative day and the sutures were removed on the 7th 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](image-url)
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 Ciciù, the intra-operative strategies responsible for the swelling have not been analyzed. Surgical flaps do not seem to be a major cause and piezoe‑surgery has not been used extensively enough to suggest that it can help to control it.[9]

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.[8‑10] Some suggest to let the wound heal by secondary intention and use of drain.[10,12] The use of a small surgical tube drain following third molar surgery reduces the postoperative complications effectively.[11,13] 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.[11] A drain soaked in tetracycline hydrochloride is also used in the impacted third molar surgery to minimize the postoperative discomfort.[12] 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.[11]

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.[13] 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.[13] 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.[14] 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.[8,15–17]

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 |
| 1st Day   | 3.52 | 0.87 | 4 | 3.6 | 0.81 | 4 |
| 3rd Day   | 2.48 | 0.87 | 2 | 2.24 | 0.66 | 2 |
| 7th 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 3rd and 7th postoperative days.[3]

Previous studies suggest that trismus developed more slowly than swelling, reaching maximum after 2–3 days.[17–19] Rakprasitkul S et al. (1997) suggested that the trismus reached peak on the 3rd postoperative day in both drain and no drain groups.[8] Cerqueira PR et al. (2004) and Saglam AA (2003) noted that there was no statistically significant difference on any postoperative days.[1,11] 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.[10,11,20,23]

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.[24] 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.

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Conflict of interest
There is no conflict of interest.

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