



“EVALUATION OF CLINICAL EFFICACY OF SURGICAL DRAIN ON POST-OPERATIVE DISCOMFORT AFTER THE REMOVAL OF IMPACTED MANDIBULAR THIRD MOLARS”

Dental Science

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ABSTRACT

Background: Reducing the post-operative complications like pain, swelling and trismus after impacted third molar surgery seems an essential goal. Among various agents used to reduce post-operative discomfort, promote healing at the site and have no unwanted side effects which could compromise the healing; Surgical Drain is one of them.

Aim: To assess and evaluate, clinical efficacy of surgical drain on post-operative discomfort in extraction of impacted mandibular third molars.

Materials and methods: 40 systemically healthy subjects in age range of 20-40 years, requiring extraction of impacted mandibular third molars were divided into two groups. Pain, Trismus and Facial Swelling was evaluated at baseline and on second, third and seventh post-operative days.

Results: Significant difference in the mean Pain, Trismus and Facial Swelling Scores between the Test and Control Groups. (p value <0.05).

KEYWORDS

Surgical drain, impacted mandibular third molar

INTRODUCTION

One of the most common oral surgical procedures include surgical extraction of impacted third molars which may often be associated with various post-operative sequelae, diversity in technique performed by the surgeons and various anecdotal opinions. **Bello SA, 2011.**¹

Reducing or minimizing the post-operative complications like pain, swelling and trismus after impacted third molar surgery seems an essential goal and any agent used to reduce post-operative discomfort should alleviate pain, reduce swelling and trismus, promote healing at the site and have no unwanted side effects which could compromise the healing; one such agent is the surgical drain as studied by **Chukwunke FN et al, 2008.**²

The use of surgical drain in Oral & Maxillofacial Surgery has been reviewed and discussed since years. In their review **Flynn TR et al, 1983**³ cited; drains are used to eliminate potential dead tissue spaces along with evacuating the inflammatory exudate, pooled blood and serum from the wound after the surgery. Surgical drain functions primarily by maintaining the patency of the wound and also by providing a channel which further helps in movement of blood and inflammatory exudate outside the wound by gravity or pressure.

The aim of this study was to assess and evaluate, clinical efficacy of surgical drain on post-operative discomfort in extraction of impacted mandibular third molars.

MATERIALS & METHODS:

A prospective randomized, experimental study was undertaken to determine the effect of using a surgical drain on postoperative variables, such as pain, swelling and trismus, which occur after third molar surgery.

The subjects in the study were selected from the outpatient department, Department of Oral and Maxillofacial surgery. Ethical Committee clearance was obtained prior to conduction of the study. A detailed case record was taken and written consent was obtained from each subject participating in the study.

A total of 40 subjects requiring extraction of impacted mandibular third molars in the age range of 20 to 40 years were selected and randomly divided into two groups for the study; Test Group: 20

subjects were treated by primary closure along with surgical drain after removal of impacted mandibular third molar. Control Group: 20 subjects were treated by primary closure alone after removal of impacted mandibular third molar.

Inclusion Criteria: Systemically healthy and co-operative subjects with no gender bias in the age range of 20 to 40 years with at least one impacted mandibular third molar & no medication in the past six months that could interfere with the healing process after surgery, willing to participate in the study were selected.

Exclusion Criteria: Subjects with systemic conditions like diabetes, hypertension, bleeding disorders, kidney & liver diseases, pregnant and lactating females were excluded from the study. Smokers, alcoholics & tobacco chewers were also excluded.

Evaluation Criteria

All subjects were evaluated preoperatively, second, third and seventh postoperative days as per the following criteria:

1. Pain was evaluated comparing primary closure with surgical drain and primary closure alone by using the VISUAL ANALOG SCALE.
2. Trismus was evaluated by measuring the distance between the mesial-incisal edges of the upper and lower right central incisors at maximum mouth opening in millimeters as described by **Ustun et al.**⁴
3. Evaluation of Facial Swelling was performed using a horizontal and vertical guide with a tape on four reference points: tragus, outer corner of mouth, outer canthus of eye and angle of the mandible (measurement of the craniometric point as described by **Souza and Consone, 1992.**⁵
 - The horizontal measure corresponded to the distance between the outer corner of the mouth and tragus.
 - The vertical measure corresponded to the distance between the outer canthus of the eye and the angle of the mandible.
 - The arithmetic means of the two measurements determined the facial measure.

Surgical Procedure

The surgical procedure was the same in all cases and performed by the same surgeon. A cut portion of Surgical Corrugated Drainage Sheet

was used as a surgical drain. Preoperatively pain score, maximum mouth opening and facial measure was recorded.

The subject was prepared under complete aseptic protocol. The subject was injected for an inferior alveolar nerve block and a long buccal nerve block. Subjective and Objective symptoms were evaluated.

Ward's incision was taken. The full-thickness mucoperiosteal flap was reflected and osteotomy around the crown of the impacted mandibular third molar was carried out along with odontosectioning of the tooth when required using a surgical bur to facilitate tooth removal and minimize bone removal. After all due procedures, the tooth was luxated using elevators and then extracted. Following removal of the impacted tooth, the surgical site was irrigated with sterile saline solution. Sharp bony edges were rounded off using a bone file and the site was closed to achieve primary closure.

In the Control group, the flap was approximated and sutured. In the Test group, a cut portion of the surgical corrugated drainage sheet was placed in the buccal fold and sutured. In both the groups 3-0 black-braided silk suture was used. (Fig 1)

All the subjects were given post-operative instructions, put on soft diet for first 24 hours and prescribed antibiotics - Capsule Amoxicillin 500 mg and Tablet Metronidazole 400 mg thrice daily for three days and analgesic - Tablet Paracetamol 500 mg thrice daily for three days. The medications were kept standard for all the subjects participating in the study.

Subjects were examined for pain, trismus (maximum mouth opening) and swelling (facial measure) on the second, third & seventh day post-operatively.

The drain was removed on the third post-operative day and sutures on the seventh post-operative day.



Fig 1: Primary Closure with placement of cut portion of Surgical Drain

STATISTICAL ANALYSIS:

After the completion of the study, the software used for statistical analysis was SPSS software (Statistical Package of Social Sciences) Version 16.

The samples were then subjected to statistical analysis using Mann - Whitney U test, Kolmogorov – Smirnov test, Shapiro – Wilk test, Independent t- test for between groups. Level of significance was kept as 0.05.

RESULTS:

	Test Statistics				
	Pain				
	PRE OP	POD2	POD3	POD7	Difference of Pre-op and POD 7
Mann-Whitney U	200.000	130.000	125.500	117.000	117.000
Wilcoxon W	410.000	340.000	335.500	327.000	327.000
Z	.000	-2.188	-2.356	-2.482	-2.482
Asymp. Sig. (2-tailed)	1.000	.029	.018	.013	.013

TABLE 1 – Mann-Whitney U test result for pain in test vs control group

	t-test	d.f.	p-value	Mean Difference
PRE OP MMO	-0.19	38	0.851	-0.3
POD2 MMO	2.067	38	0.046	3.55
POD3 MMO	2.972	38	0.005	5.75
POD7 MMO	4.447	38	0.000	7.2
Difference MMO	-9.844	38	0.000	-7.5

TABLE 2 – Independent t-test for maximum mouth opening

	t-test	d.f.	p-value	Mean Difference
PRE OP FM	-2.003	38	0.052	-3.6
POD2 FM	-2.563	38	0.014	-4.925
POD3 FM	-2.697	38	0.01	-3.835
POD7 FM	-2.611	38	0.013	-4.685
Difference-FM	2.632	38	0.012	1.085

TABLE 3 – Independent t-test for Facial Measure

The study was a randomized control trial with a total of 40 subjects divided into Control & Test Groups as mentioned above. The mean age of the subjects selected for the study was **32 years (31.85±6.78)**.

While comparing pain scores, p-value for the **Mann-Whitney U test** was less than 0.05 on post-operative day two (p=0.029), post-operative day three (p=0.018) and post-operative day seven (p=0.013) and also the difference of pre-operative & post-operative day seven. This indicated significance of difference between average pain score of test and control groups. (Table 1)

For **maximum mouth opening** p-value for the **Independent t-test** of on all post-operative days was **less than that of 0.05**, indicating the difference is significant in Maximum Mouth Opening when compared between test and control groups. The difference is not significant for pre-op as the p-value > 0.05. (Table 2)

In **facial measure** p-value for the independent t-test on all post-operative days was **less than 0.05** indicating significance of difference in Facial Measure when compared between test and control groups. The difference is not significant for scores measured pre-operatively as the p-value > 0.05. (Table 3)

DISCUSSION:

In an attempt to decrease post-operative discomfort many authors have used tube drains in the buccal fold after surgical removal of third molars. ⁶ Rakprasitkul ⁷ Saglam AA ⁸ Cerqueira ⁹ and Ayad W ¹⁰ suggested the use of a small tube drain following third molar surgery to reduce the post-operative discomfort. Cerqueira et al hypothesized that a drain allows the patient to experience more comfort post-operatively pertaining to the pain, swelling and trismus, because it allows for the drainage of fluids collected in the tissue spaces. ⁹

Simple corrugated drains have an advantage of being adaptable, soft, and inexpensive. A drain to which suction can be applied can eliminate pooled blood, serum, and dead space from a wound by drawing the separated tissue surfaces together. (McFarlane RM, 1958) ¹¹

The onset of pain begins as the effects of the local anesthetic agent subside. Unless treated, moderate to severe pain usually occurs during the first 12 hours, with peak intensity after about six – eight hours when a conventional local anesthetic is used. The pain then gradually disappears within a few days, provided if normal healing occurs. ¹²

Studies by Rakprasitkul et al, ⁷ Saglam AA et al, ⁸ & Cerqueira et al ⁹ showed that there was no statistically significant difference in pain post-operatively in the drain and non-drain group. The results of this study were in accordance to studies by Koyuncu BO et al ¹³ who found statistically significant difference in pain scores in drain and non-drain group.

The time relation of swelling subsequent to mandibular third molar surgery has been examined in a number of studies. ¹⁴ According to these studies it was observed that development of swelling started shortly after surgery and usually reached a maximum after 36 hours.

In this study there was a significant difference in the facial measure in the drain group as compared to the non-drain group. These results were similar to the results in the studies conducted by Rakprasitkul et al, ⁷

Saglam AA et al,⁸ Cerqueira et al,⁹ Koyuncu BO et al¹³ & Pasqualini D et al¹⁵ observed that swelling was significantly less in the secondary closure group compared to primary closure group. **Ordulu et al¹⁶** observed no significant difference in facial swelling in the drain and non-drain group.

Hashemi HM et al 2012 reported that maintenance or creation of a path through which inflammatory exudates could be drained from the operated site could reduce post-operative edema and swelling after removal of impacted teeth.¹⁷

Rakprasitkul et al⁷ in his comparative study found that the trismus reached peak on the third post-operative day in both drain and no-drain groups. In this study it is observed that the trismus was greater on the first post-operative day in both the groups.

In this study there was a significant difference in the maximum mouth opening (trismus) in the drain group as compared to the non-drain group post-operatively. These results were similar to the observations by **Koyuncu BO et al.¹³**

One of the disadvantages for the use of drain was that the patients refusing the insertion of a foreign material in their oral cavity for three days, and many a times complaint of bleeding from the drain site (**Ordulu, 2006**).¹⁶

SUMMARY AND CONCLUSION:

Based on this study, placement of a surgical drain tube before primary closure following mandibular third molar surgery is statistically significant ($p < 0.05$), & gave better results with respect to pain, swelling and trismus than cases with primary closure alone.

The use of surgical drain after surgical extraction of impacted mandibular third molar is a simple, non-invasive, drug free, cost effective and time saving technique to reduce post-operative discomfort like pain, swelling and trismus.

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