

Impact of Drains on the Postoperative Sequel Following Third Molar Surgery: An Original Research

**Dr. Mohammed Ibrahim¹, Dr. Samiksha Singh Jadon², Dr. Piyush Sharma³,
Dr. Siva Kumar Pendyala⁴, Dr. Heena Tiwari⁵, Dr Sachin S. Hotkar⁶**

¹Assistant Professor, Department of Oral and Maxillofacial Surgery, College of dentistry, King Khalid University, Abha, Kingdom of Saudi Arabia. drmohammedibrahim79@gmail.com

²Dental Surgeon, Sri Ganganagar, Rajasthan, India. samikshajadon@gmail.com

³Consultant Oral and Maxillofacial Surgeon, Raffles Hospital Chongqing, India.
piyushsharmabds@yahoo.co.in

⁴Associate Professor, Department of Oral & Maxillofacial Surgery, Faculty of Dentistry, AIMST UNIVERSITY, Semeling, Bedong, Kedah-08100, Malaysia. drsiva77@gmail.com

⁵BDS, PGDHHM, MPH Student, Parul University, Limda, Waghodia, Vadodara, Gujarat, India.
drheenaatiwari@gmail.com

⁶PG Student, PG student Dept of Oral & Maxillofacial Surgery, YMT Dental College Kharghar Navi Mumbai. drsachinhotkar@gmail.com

Corresponding Author: Dr. Mohammed Ibrahim, Assistant Professor, Department of Oral and Maxillofacial Surgery, College of dentistry, King Khalid University, Abha, Kingdom of Saudi Arabia. drmohammedibrahim79@gmail.com

ABSTRACT:

Purpose: This paper is aimed at assessing the role of a rubber drain in the postoperative sequel following third molar surgery.

Materials and method: A comparative split-mouth study has been implemented on 60 patients with identical partially erupted bilateral wisdom teeth necessitating their removal. All surgical interventions for the removal of impacted third molars were performed using a modified Ward's incision followed by bone guttering and tooth sectioning. The right side of the patient was designated as the test side where following the surgical intervention a rubber drain was placed and stabilized at the anterior release of the surgical incision while on the left side of the patient was designated as control side where following the surgical intervention the anterior release of the surgical incision was not sutured to facilitate drainage. The impact of the drains in the postoperative sequel following the removal of wisdom teeth surgically was evaluated using parameters like postoperative swelling, pain, trismus and wound infections.

Results: The results of this study reveal that there is no appreciable positive impact of using a drain on postoperative sequel like pain, swelling and trismus following third molar surgery. Pain was relatively more in the test side on the third postoperative day when compared to the control side. With regards to wound infections, 3 patients on the test side developed wound infection in the postoperative period while none experienced wound infection on the control side.

Conclusion: It can be concluded that the use of a rubber drain do not have any positive impact on reducing the postoperative sequel

Keywords: Impacted molars, postoperative swelling, Trismus, postoperative pain

Introduction

Literature is replete with evidence suggesting that surgical removal of the unerupted wisdom tooth is the frequently performed clinical intervention in oral surgical practice.¹ An attempt to remove a deep seated impacted wisdom tooth is associated with substantial surgical challenge even to an experienced operator. Literature shows that any surgical intervention carried out to remove a deeply seated impacted wisdom tooth is associated with many complications. These may present as alveolar osteitis, secondary infection, dysesthesia, pain, swelling, hemorrhage and even iatrogenic fracture of the mandible.^{2,3,4}

Previous studies have shown that there occurs a non-infective inflammatory response during third molar surgery and the chemical mediators that are released during this process are responsible for the initiation of swelling, pain and trismus.^{5,6,7} This would eventually jeopardize the quality of life in the immediate postoperative period. Numerous options have been put forth in the literature pertaining to the management of the extraction sockets subsequent to third molar surgery beginning from a simple primary closure of the surgical wound to the placement of several kinds of drains, gauze strips or dressings.^{8,9,10,11} Even though some previous studies in the past have suggested a beneficial effect following the placement of drains on the postoperative swelling, pain or trismus few previous studies have contradicted their use.^{9,12} Hence, this paper is aimed at assessing the role of rubber drain in the postoperative sequel following third molar surgery.

Materials & Method:

A comparative split mouth study was conducted comprising of 60 healthy patients (age 18–30; 28 males, 32 females) who were diagnosed clinically and radiographically with identical bilateral impacted lower third molars and required their surgical removal to relate and evaluate the impact of drains on the postoperative sequel following third molar surgery between the period of April 2017 to November 2019. The right side of the patient was designated as the test side where following the surgical intervention a rubber drain was placed and stabilized at the anterior release of the surgical incision while on the left side of the patient was designated as control side where following the surgical intervention the anterior release of the surgical incision was not sutured to facilitate drainage. Institutional ethical clearance was obtained.

Inclusion criteria for this study included those patients with bilateral symmetrical impacted lower third molars with similar difficulty index which are not associated with any acute infection or any other systemic problems. Those patients who were allergic to the local anesthetic agent and pregnant patients were excluded. Patient was subjected to thorough clinical and systematic evaluation and consents were obtained. A final diagnosis was arrived at with the aid of Winter's classification for impacted mandibular third molars. All the patients were evaluated intraorally for any signs of infection in addition to quantifying the mouth opening with the aid of a scale. A treatment plan was formulated and all the unerupted wisdom teeth were removed using a modified Ward's incision.

The same surgeon operated on all the patients. The procedures were carried out under local anesthesia with adrenaline (1:80,000) under strict aseptic conditions. The impact of the drains in the postoperative sequel following the removal of unerupted wisdom teeth surgically was evaluated using parameters like postoperative swelling, pain, trismus and wound infections.

Pain in the postoperative period was evaluated with the aid of a VAS scale with readings stretching from zero (no pain) to ten (highest imaginable pain). Facial swelling is measured by taking reliable landmarks on the face. Anterio-posteriorly the swelling is measured from the corner of the mouth to the tragus of the ear and supero-inferiorly the swelling is measured from the lateral canthus to the angle of the mandible. Considering the fact that the facial swelling becomes prominent following 48 – 72 hours of surgery patients were recalled for check up on the third and tenth postoperative days. Drains were detached on the third postoperative day while sutures were removed on the tenth postoperative day. Results were tabulated and analyzed.

Statistical Methods: The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 version 18 and Chi-square test was employed to evaluate both the groups with regards pain, swelling, trismus and wound infections. For statistical significance a P-value of less than 0.05 was deliberated

Results:

This study included 60 healthy patients with a mean age of 24.6 years. All third molars which were subjected to surgical removal were identical and were mesioangularly impacted based on Winters classification and were moderately difficult based on the classification of Pell and Gregory. The mean difficulty index was 5.65 on the test side and the mean difficulty index was 5.40 on the control side. Using chi-square test no significant differences were noted between the two sides pertaining to the difficulty index ($p = 0.85$). The mean surgical intervention time on the test side was 43.60 min while on the control side it was 37.80 min as shown in Figure – 1. No statistically significant differences were noticed ($p = 0.90$).

No statistical differences were noticed pertaining to postoperative swelling on both the sides on the third postoperative day ($p = 0.38$) as well as the tenth postoperative day ($p = 0.75$). Comparative evaluation pertaining to trismus on the third postoperative day ($p = 0.54$) and tenth postoperative day ($p = 0.74$) also revealed no significant differences between both the sides as shown in Figure - 2. With regards to the VAS score, it was observed that on the third postoperative day pain was marginally more on the test side than the control side, but no statistical significant differences were noted ($p = 0.65$). No differences were noted with regards to the pain scores between both the sides on the tenth postoperative day as shown in Figure - 3. Pertaining to wound infection, 3 patients (10%) on the test side developed wound infection in the postoperative period while none experienced wound infection on the control side as shown in Figure - 4.

Discussion:

It is a well-known fact that removal of unerupted wisdom tooth surgically can lead to postoperative sequel in the form of pain, trismus and swelling.^{5,6} The management of the extraction socket after the removal of unerupted wisdom tooth surgically in order to reduce the postoperative sequel still remains debatable.

There exists a difference of opinion among the operators pertaining to wound closure techniques that need to be employed following surgical removal of impacted mandibular third molars. Even though primary closure is considered the gold standard few advocate the surgical wound to heal by secondary intention with the aid of drains.¹³ Cerqueira *et al.* advocated that a

drain reduces pain, swelling and trismus because it permits the drainage of the residual blood collected in the tissue spaces.¹⁴ Drains soaked in tetracycline hydrochloride are also used to minimize the postoperative discomfort.¹⁰

A recent study employed 3D face scans to quantify the amount of swelling following wisdom tooth removal and advocated that the 3D scans can be considered as a reliable tool that works without having physical contact with the patient or exposing the patient to radiation.¹² They concluded that this technique is better than other techniques by providing fast and reliable results without any negative side effects to the patients.¹² Literature reveals numerous studies which evaluated the effect of rubber drains and compared them with conventional primary suturing on postoperative discomfort after extraction of impacted mandibular third molars.^{15,16} They advocated that the use a tube drain is of benefit in reducing the postoperative swelling, pain, and trismus after surgical removal of mandibular third molars.

The results of this study reveal no significant differences pertaining to the postoperative swelling between both the sides in the immediate postoperative phase. This is in accordance with previous studies.^{12,17} In contrast to the findings of our study, few studies suggested that the rubber drains when employed can considerably reduce the postoperative swelling.^{18,19}

The results of this study with regards to the VAS score reveal that pain was marginally more on the test side than the control side 72 hours subsequent to third molar surgery, but the statistical difference was not significant. Pain scores were identical on both the sides on the tenth day. This was in accordance with few studies from the past.^{12,14} Literature suggests that the postoperative sequel subsequent to wisdom tooth removal depends on the flap design as well as the type of cutting instrument used.^{20,21} A recent study evaluated secondary versus primary closure techniques for the prevention of postoperative complications following removal of impacted mandibular third molars and concluded that differences between primary and secondary closure techniques after impacted mandibular third molar extraction are minimal and there are no preferences for either of the techniques.²²

It can be concluded that though the placement of a rubber drain may aid in the reduction of postoperative sequel like pain, swelling and trismus based on the available literature but this study revealed no such beneficial effects. Secondly, the authors of this study advocate that the placement of a rubber drain can cause physical discomfort to the patient in the initial postoperative period and can also lead to surgical site infection. Hence, there is more potential harm than benefit for the placement of rubber drain. The limitations of this study include the small sample size and restricting the study to only bilateral symmetrical impacted lower third molars with similar difficulty index. The results of this study reveal no difference pertaining to the duration of the surgical intervention between the test side and the control side. It can be concluded that the design of this study is more suitable for outpatient practice.

Conclusion:

It can be concluded that there was no significant positive impact of placement of a drain on the postoperative sequel like swelling, pain, trismus or wound infections following surgical removal of wisdom tooth. Thus, the authors do not recommend the placement of a drain in prophylactic wisdom tooth removals however; in clinical scenarios with an existing preoperative infection a drain might still be beneficial.

ACKNOWLEDGEMENT:

We thank Mina Doos, BDS, Faculty of dentistry and oral medicine pharos university in Alexandria, Egypt for assisting in literature collection and reviewing the manuscript.

References:

- 1) Uppada UK. A Modification of Ward's Incision for Third Molar Surgery. *J Dent Res Rev* 2019;6:77-8.
- 2) Goldberg MH, Nemerich AN, Marco WP II. Complications after mandibular third molar surgery: a statistical analysis of 500 consecutive procedures. *J Am Dent Assoc.* 1985; 111: 277– 279
- 3) Osborn TP, Frederickson G, Small IA, Torgerson TS. A prospective study of complications related to mandibular third molar surgery. *J Oral Maxillofac Surg.* 1985; 43: 767–769.
- 4) Uppada UK, Ramen Sinha. Iatrogenic mandibular ramus fracture following surgical removal of impacted third molar. *J Maxillofac Oral Surg.* 2020 In Press
- 5) Deepti C, Rehan HS, Mehra P. Changes in quality of life after surgical removal of impacted mandibular third molar teeth. *J Maxillofac Oral Surg* 2009;8(3):257–260.
- 6) Sigron GR, Pourmand PP, Mache B, Stadlinger B, Locher MC. The most common complications after wisdom-tooth removal: part 1: a retrospective study of 1,199 cases in the mandible. *Swiss Dent J* 2014;124(10):1042–1046
- 7) Dhanrajani P, Jonaidel O. Trismus: aetiology, differential diagnosis and treatment. *Dent Updat* 2002;29(2):88–94
- 8) Chaudhary M, Singh M, Singh S, Singh SP, Kaur G. Primary and secondary closure technique following removal of impacted mandibular third molars: a comparative study. *Natl J Maxillofac Surg* 2012;3(1):10–14
- 9) 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(8):1640–1650.
- 10) 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(1):25–29
- 11) Egbor PE, Saheeb BD A prospective randomized clinical study of the influence of primary closure or dressing on postoperative morbidity after mandibular third molar surgery. *Niger J Surg* 2014;20(2):59–63
- 12) Katz MS et al. Effect of drain application on postoperative complaints after surgical removal of impacted wisdom teeth—a randomized observer-blinded split-mouth clinical trial. *Clin Oral Invest* 2020; <https://doi.org/10.1007/s00784-020-03464-5>
- 13) 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(2): 637–641.
- 14) 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.
- 15) B Ö Koyuncu, M Zeytinoglu, A Tetik, M M Gomel. Effect of tube drainage compared with conventional suturing on postoperative discomfort after extraction of impacted mandibular third molars. *Br J Oral Maxillofac Surg* 2015;53(1):63-7.

- 16) Chukwuneke FN, Oji C, Saheeb DB. A comparative study of the effect of using a rubber drain on postoperative discomfort following lower third molar surgery. *Int J Oral maxillofac Surg* 2008;37(4):341-4.
- 17) de Brabander EC, Cattaneo G. The effect 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(2):119–121.
- 18) Kumar B, Bhate K, Dolas R, Kumar SS, Waknis P. Comparative evaluation of immediate post-operative sequelae after surgical removal of impacted mandibular third molar with or without tube drain-Split-mouth study. *J Clin Diagn Res* 2016;10(12):ZC46– ZC49
- 19) Obimakinde O, Fasola A, Arotiba J, Okoje V, Obiechina A. Comparative effect of tube drain on post operative inflammatory complications of impacted mandibular third molar surgery College Hospital, Ibadan, Nigeria. *Niger Postgrad Med J* 2010;17(3):194–199
- 20) Malik NA. Minor oral surgical procedures. In: Malik NA (ed) *Textbook of oral and maxillofacial surgery*, 2012, 2nd edn. Jaypee Brothers Medical Publishers, New Delhi, pp 138–159
- 21) Uppada UK. A modification of Ward's incision for management of mandibular angle fracture. *J Dent Res Rev* 2020;7:91-3.
- 22) Secondary versus primary closure techniques for the prevention of postoperative complications following removal of impacted mandibular third molars: a systematic review and meta-analysis of randomized controlled trials. Carrasco-Labra A, Brignardello-Petersen R, Yanine N, Araya I, Guyatt G. *J Oral Maxillofac Surg* 2012;70(8):e441-57.

Legends:

Figure 1: Graph showing the duration of surgical intervention between both the groups

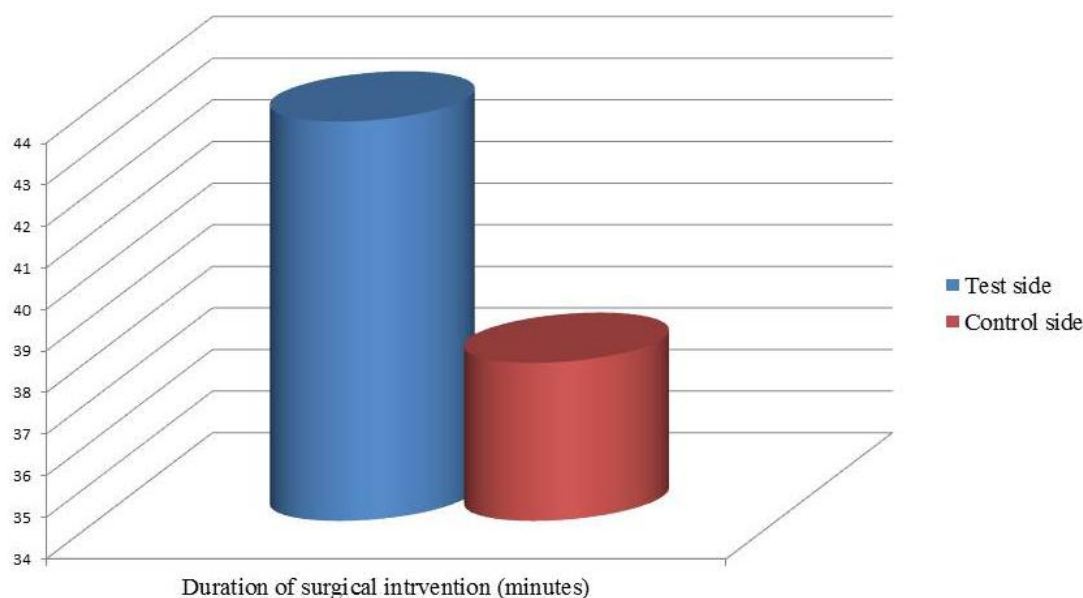


Figure 2: Graph showing the man mouth opening between both the groups

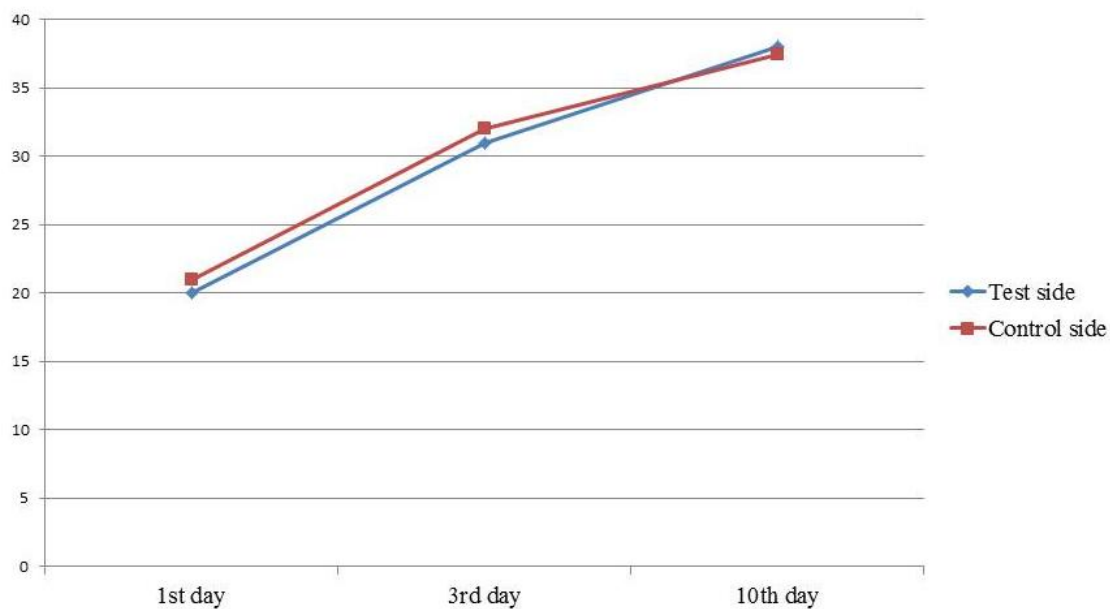


Figure 3: Graph showing the mean VAS scores between both the groups

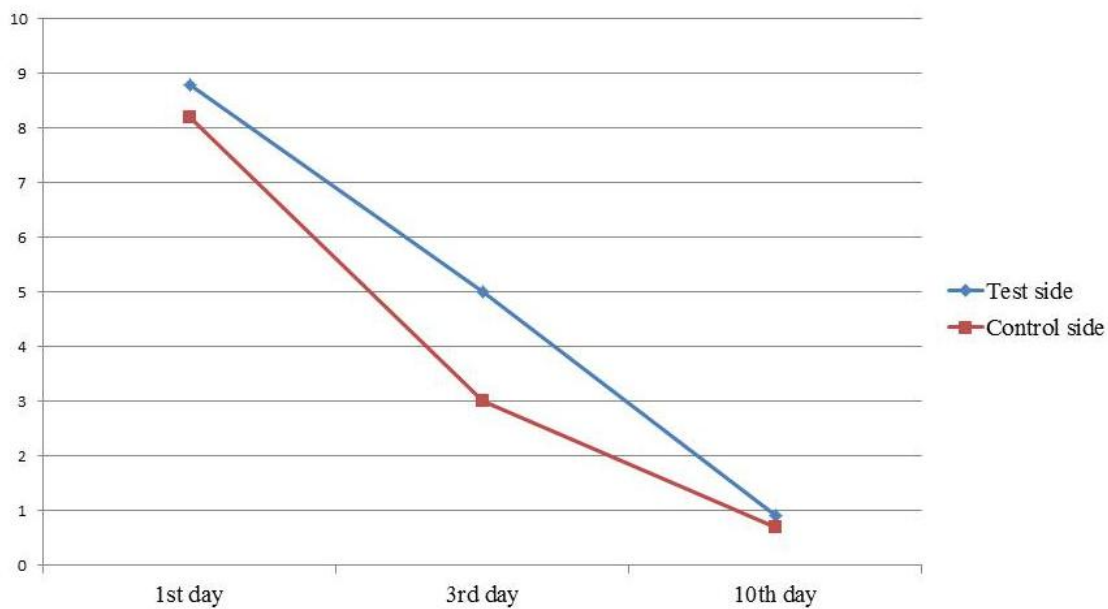


Figure 4: Graph showing the percentage of wound infection between both the groups.

