

A Comparison between the Outcomes of Wound Closure by Primary and Secondary Healing after Mandibular 3rd Molar Impaction Surgery

NAYAB SHAD¹, MARYAM JAVED², MUHAMMAD SAAD UI HASAN³, ZAFAR ABBAS⁴, SAYYEDA TATHEER FATIMA⁵

¹ Islamic International Medical and Dental College Islamabad

² House Officer, Armed Forces Institute of Dentistry, Rawalpindi

³ BDS, Liaquat College of Medical and Dentistry, Karachi

⁴ Assistant Professor, Dow International Dental College, Karachi

⁵ PG Trainee, Islamic international Dental College, Islamabad

Corresponding author: Maryam Javed, Email: Mj28728@gmail.com

ABSTRACT

Background: The one of the most frequently performed procedure by the surgeon in the oral and maxillofacial surgeries is removal of mandibular third molar.

Objective: The study aimed to compare the process of primary and secondary wound closure outcomes after the surgical removal of impacted mandibular third molar.

Study design: It is a comparative study conducted at Armed Forces Institute of Dentistry, Rawalpindi for the duration of six months from Jan 2022 to June 2022.

Material and Methods: The 65 patients visited the oral and maxillofacial surgery department of hospital were included in the study. According to the inclusion criteria, these patients had impacted their third molar and they were medically fit and ready to come for follow ups after the operation as well. The patients were divided into two groups. The group A had 33 patients, the average age of these patients was 30 years and proportion of male and female among these 33 patients was 40% male (13) and 60% female (20). Group B had 32 patients and among those 32 patients there were 46% male (14) and 53% female (18) and the average age of the participants was 27.

Results: The percentage incidence of swelling and pain was higher in the group A. The values was statistically significant. The mouth opening was highly observed in the group B patients. The post-operative pain was measured at first day, third day and 7th day by making use of the visual analog scale. The comparison was made. The mean pain score on third day was 4.9 and 3.5 and on the seventh day the mean pain score was 3.2 and 1.5 respectively for group A and B. the overall variation in pain scores were significantly high.

Conclusion: In this study, the conclusion is made that the secondary closure was a suitable option then the primary closure for the post-operative pain and swelling. There was no variation found in case of periodontal healing irrespective of the closure procedure used, but the risk of infection and food impaction is more in case of secondary closure. Therefore, if patients have poor hygiene conditions secondary closure is not suitable for them.

Keywords: wound closure, healing type and mandibular third molar.

INTRODUCTION

The one of the most frequently performed procedure by the surgeon in the oral and maxillofacial surgeries is removal of mandibular third molar. It has added to the workload of the oral surgeons.

This procedure require the expertise of surgeon with sound knowledge of anatomy and technical skills. Other demands of the procedure are good anesthesia practice, total patient care and proper medications. The swelling and pain are highly observed in the postoperative period of patients after the surgical removal of mandibular third molar. This period is characterized by temporary restricted mouth opening, swelling and pain.

The type of healing of the surgical is closely linked to the postoperative pain and swelling intensity. In the other words, the type of healing determine the intensity of pain and swelling. The socket become fully closed in case of primary healing while the edema fluid drainage facilitated by the gaps between wounds is observed in case of secondary healing. The data in literature is controversial about the healing of wound by primary and secondary process. Few surgeons are in favor of the primary healing while others in favor healing of wound by secondary type. The surgeon reported that features or outcomes like pain, swelling were found to be less in case of secondary closure. While in few studies the surgeon reported no remarkable and significant difference in the primary and secondary healing. The surgeon also reported that in case of the secondary closure there are reduced chances of edema caused by operation. The secondary closure is more suitable for patients in majority of the cases as it reduces the extent of outcomes like swelling and pain. However, age, gender and other features can prove to interfere with the results in some postoperative outcomes.

The outcomes like swelling and pain are highly determined by the expertise of the surgeon their abilities. This study was carried out to check the primary and secondary wound closure

outcomes after the impaction surgery of mandibular third molar. The outcomes can be worsen by different factors like age, gender, and many other local factors like oral hygiene, the use of cigarettes, the sort of impaction used and the presence of pericoronitis.

MATERIAL AND METHODS

It is a comparative study conducted at Armed Forces Institute of Dentistry, Rawalpindi for the duration of six months from Jan 2022 to June 2022. The 65 patients visited the oral and maxillofacial surgery department of hospital were included in the study. The ethical and review board committee of the hospital approved the study. The patients were informed about the study objective and they willingly signed the consent. According to the inclusion criteria, the patients having any systematic disease were excluded from the study. All the patients with deleterious habits i.e smoking and betelnut chewing were also excluded from the study. The preoperative radiograph i.e, OPG and IOPAR were taken. The metallic scale or Williams periodontal probe was used to measure the mouth opening.

According to the inclusion criteria, these patients had impacted their third molar and they were medically fit and ready to come for follow ups after the operation as well. The patients were divided into two groups. The group A had 33 patients, the average age of these patients was 30 years and proportion of male and female among these 33 patients was 40% male (13) and 60% female (20). Group B had 32 patients and among those 32 patients there were 46% male (14) and 53% female (18) and the average age of the participants was 27. The SPSS tool was used for the statistical analysis of the data collected. The t test was performed for the comparison and evaluation of the results of two groups.

RESULTS

The study was carried out to check the primary and secondary wound closure outcomes after the impaction surgery of mandibular third molar. There were 65 patients that participated in this study, these patients had impacted their third molar and they were medically fit and ready to come for follow ups after the operation as well. The patients were divided into two groups and different closure was done for both groups. The group A had 33 patients, the average age of these patients was 30 years and proportion of male and female among these 33 patients was 40% male (13) and 60% female (20). Group B had 32 patients and among those 32 patients there were 46% male (14) and 53% female (18) and the average age of the participants was 27.

The post-operative pain was analyzed and measured at first day, third day and 7th day by making use of the visual analog scale. The comparison was done for the pain score at various time intervals between group A and group B. The average of pain score on the first post-operative day was 7 and 5 in group A and B respectively. The mean pain score on third day was 4.9 and 3.5 and on the seventh day the mean pain score was 3.2 and 1.5 respectively for group A and B. the overall variation in pain scores were significantly high.

Likewise, post-operative swelling was also measured and the results were analyzed accordingly. Other complications like alveolar osteitis was also determined in patients.

Table 1: The descriptive pain statistics

Pain	Groups	Average	No. of patients (N)
Day 1	A	7.1	33
	B	5.6	32
Day 3	A	4.9	33
	B	3.5	32
Day 7	A	3.2	33
	B	1.5	32

Table 2: The descriptive swelling statistics

Swelling	Groups	Average	No. of patients (N)
Day 1	A	12.1	33
	B	7.5	32
Day 3	A	6.5	33
	B	4.6	32
Day 7	A	2.7	33
	B	1.7	32

DISCUSSION

In case of oral-maxillofacial surgery, the surgical removal of the third molar is a very general procedure that is carried out. In this study the comparative analysis was carried out to find the primary and secondary wound closure outcomes after the impaction surgery of mandibular third molar. The period that follows after this surgery ranges from mild to severe pain. As the region where surgery is performed has loose connective tissues containing blood and network of lymph vessels. Therefore, after surgery there is an expected series of variations in the structure and function that can lead to pain and swelling. The factors that can worsen the outcomes include features like age, gender, and many other local factors like oral hygiene, the use of cigarettes, the sort of impaction used and the presence of pericoronitis.

The complications or outcomes after surgery can also be linked to the surgical technique used by surgeons while performing the procedure and then the suturing technique that is followed by the main surgery. All these factors play role in making the outcomes worse or tolerable.

In this study it was found that the because of less pain, swelling and conditions like trismus the secondary closure was more suitable for patients. it was found that the periodontal healing shows no variation in both closure techniques. The pain was analyzed and measured by using visual analogue scale which can tell about the pain readings and is routinely used for this purpose.

VAS is a ten number straight line which is having no demarcations with right and left extreme points showing the worst

pain and the no pain at all features. Patients are guided to use these before any procedure that include surgery and the instructions are made to put line at the scale which will helpfully tell about the extent of the pain they felt. The numerical representation is shown from left to right.

The similar procedure was used for swelling percentage as well, the distance was measured from outer canthus, the angle of the mandible and the tragus of the ear that will tell how much swelling has taken place. There are also other methods that can tell about the swelling produced after surgery like computed tomography and stereographic procedures.

This method of welling measurement was used in this study as it is the most popular method and is frequently available to use, it requires less equipment and is cheaper than the other methods. As per studies carried out by a group of scientist the mouth opening is also measured with use of metallic scale or by using Williams periodontal probe.

The expertise of the surgeon their abilities also play an important role in determining the rate of outcomes like swelling and pain. In this study all the procedures were performed by single surgeon. The results shown that then features or outcomes like pain, swelling were found to be less in case of secondary closure and these results are similar to the previous studies carried out.

The pain and swelling was observed more in case of primary closure of wound and in case of secondary closure the pain and swelling was much reduced. The secondary closure reduce the edema caused by operation and the comfort of the patient was seen more in case of secondary closure of the wound.

According to the studies, it was found that the swelling and pain after operate was more when the wound was healed in an open form rather than the closed form. The quality and time of healing was much improved in case of closed healing. The age of the patients also plays important role in determining some factors like in case of periodontal complications the age is an important factor that can produce different results as younger patients heal better as compared to aged persons, in this study the majority of the patients were less than 30 years so age was not disturbing the results. Therefore, the study showed that the secondary closure was more suitable for patients in majority of the cases as it reduces the extent of outcomes like swelling and pain. However, age, gender and other features can prove to interfere with the results in some postoperative outcomes.

CONCLUSION

In this study, the conclusion is made that the secondary closure was a suitable option then the primary closure for the post-operative pain and swelling. There was no variation found in case of periodontal healing irrespective of the closure procedure used, but the risk of infection and food impaction is more in case of secondary closure. Therefore, if patients have poor hygiene conditions secondary closure is not suitable for them.

REFERENCES

1. Pasqualini D, Cocero N, Castella A, Mela L, Bracco P. Primary and secondary closure of the surgical wound after removal of impacted mandibular third molars: a comparative study. *International journal of oral and maxillofacial surgery*. 2005 Jan 1;34(1):52-7.
2. Pachipulusu PK. Comparative study of primary and secondary closure of the surgical wound after removal of impacted mandibular third molars. *Oral and Maxillofacial Surgery*. 2018 Sep;22(3):261-6.
3. Maria A, Malik M, Virang P. Comparison of primary and secondary closure of the surgical wound after removal of impacted mandibular third molars. *Journal of maxillofacial and oral surgery*. 2012 Sep;11(3):276-83.
4. Kilinc A, Ataol M. How effective is collagen resorbable membrane placement after partially impacted mandibular third molar surgery on postoperative morbidity? A prospective randomized comparative study. *BMC Oral Health*. 2017 Dec;17(1):1-8.
5. Hashemi HM, Beshkar M, Aghajani R. The effect of sutureless wound closure on postoperative pain and swelling after impacted mandibular third molar surgery. *British Journal of Oral and Maxillofacial Surgery*. 2012 Apr 1;50(3):256-8.

6. Dubois DD, Pizer ME, Chinnis RJ. Comparison of primary and secondary closure techniques after removal of impacted mandibular third molars. *Journal of Oral and Maxillofacial Surgery*. 1982 Oct 1;40(10):631-4.
7. Khande K, Saluja H, Mahindra U. Primary and secondary closure of the surgical wound after removal of impacted mandibular third molars. *Journal of maxillofacial and oral surgery*. 2011 Jun;10(2):112-7.
8. Danda AK, Tatiparthi MK, Narayanan V, Siddareddi A. Influence of primary and secondary closure of surgical wound after impacted mandibular third molar removal on postoperative pain and swelling—a comparative and split mouth study. *Journal of Oral and Maxillofacial Surgery*. 2010 Feb 1;68(2):309-12.
9. Osunde OD, Adebola RA, Saheeb BD. A comparative study of the effect of suture-less and multiple suture techniques on inflammatory complications following third molar surgery. *International journal of oral and maxillofacial surgery*. 2012 Oct 1;41(10):1275-9.
10. Carrasco-Labra A, Brignardello-Petersen R, Yanine N, Araya I, Guyatt G. 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. *Journal of Oral and Maxillofacial Surgery*. 2012 Aug 1;70(8):e441-57.
11. Sortino F, Cicciù M. Strategies used to inhibit postoperative swelling following removal of impacted lower third molar. *Dental research journal*. 2011 Oct;8(4):162.
12. Singh G, Gaur A, Mishra M, Mahesh C, Aurora JK, Gupta P. Comparative evaluation of primary and secondary closure after surgical removal of impacted mandibular third molar. *Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology*. 2014 Apr 1;26(2):133-7.
13. Osunde OD, Saheeb BD, Adebola RA. Comparative study of effect of single and multiple suture techniques on inflammatory complications after third molar surgery. *Journal of Oral and Maxillofacial Surgery*. 2011 Apr 1;69(4):971-6.
14. Bello SA, Olaitan AA, Ladeinde AL. A randomized comparison of the effect of partial and total wound closure techniques on postoperative morbidity after mandibular third molar surgery. *Journal of Oral and Maxillofacial Surgery*. 2011 Jun 1;69(6):e24-30.
15. Gay-Escoda C, Gómez-Santos L, Sánchez-Torres A, Herráez-Vilas JM. Effect of the suture technique on postoperative pain, swelling and trismus after removal of lower third molars: A randomized clinical trial. *Medicina oral, patología oral y cirugía bucal*. 2015 May;20(3):e372.
16. Egbor PE, Saheeb BD. A Prospective Randomized Clinical Study of the Influence of Primary Closure or Dressing on Post-operative Morbidity after Mandibular Third Molar Surgery. *Nigerian Journal of Surgery*. 2014 Aug 22;20(2):59-63.
17. Ricard AS, Nau O, Veyret A, Majoufre-Lefèbvre C, Laurentjoye M. Comparison between closure and absence of closure after removal of fully impacted mandibular third molar: a prospective randomized study. *Revue de stomatologie, de chirurgie maxillo-faciale et de chirurgie orale*. 2015 Jan 7;116(1):12-7.
18. Ordulu M, Aktas I, Yalcin S, Azak AN, Evlioglu G, Disçi R, Emes Y. Comparative study of the effect of tube drainage versus methylprednisolone after third molar surgery. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*. 2006 Jun 1;101(6):e96-100.
19. Ma S, Li X, Zhang A, Liu S, Zhao H, Zhao H. Efficacy of secondary closure technique after extraction of third molars: a meta-analysis. *British Journal of Oral and Maxillofacial Surgery*. 2019 Dec 1;57(10):977-84.
20. Anighoro EO, Gbotolorun OM, Adewole RA, Arotiba GT, Effiom OA. Assessment of the effect of wound closure technique on postoperative sequelae and complications after impacted mandibular third molar extraction. *Open Journal of Stomatology*. 2013 Dec 1;3(09):527.
21. Oladega AA, James O, Adeyemo WL. Cyanoacrylate tissue adhesive or silk suture for closure of surgical wound following removal of an impacted mandibular third molar: A randomized controlled study. *Journal of Cranio-Maxillofacial Surgery*. 2019 Jan 1;47(1):93-8.
22. Aydintug YS, Bayar GR, Gulses A, Misir AF, Ogretir O, Dogan N, Sencimen M, Acikel CH. Clinical study on the closure of extraction wounds of partially soft tissue-impacted mandibular third molars. *Quintessence Int*. 2012 Nov 1;43(10):863-70.
23. Erdogan Ö, Tatlı U, Üstün Y, Damlar I. Influence of two different flap designs on the sequelae of mandibular third molar surgery. *Oral and maxillofacial surgery*. 2011 Sep;15(3):147-52.