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Postoperative Outcomes of Impacted Mandibular Third Molar Surgery: A Comparative Review of Closure Techniques

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ABSTRACT

The surgical extraction of impacted mandibular third molars is a common procedure that can lead to various postoperative complications, including pain, swelling, and trismus. Evidence suggests that the choice of technique can significantly influence patient outcomes. Studies indicate that the sutureless technique may lead to increased postoperative pain, while showing reduced trismus compared to complete closure. Facial swelling results from inflammatory responses, and both techniques may allow for some drainage, mitigating this issue. Each technique has its advantages and disadvantages; sutures promote rapid healing but may cause discomfort, while sutureless methods are generally less painful but can result in slower healing. The effectiveness of each technique remains contested, warranting further investigation to establish clear guidelines. Ultimately, the choice of technique depends on the surgeon's expertise, patient factors, and the complexity of the case. This article compares two primary wound closure techniques: complete closure using sutures and the emerging sutureless approach.

Keywords: Impacted Mandibular Third Molars, Surgical Extraction, Postoperative Complications, Sutures, Sutureless Techniques, Pain, Swelling, Trismus.

Introduction

The surgical extraction of impacted mandibular third molars is a routine procedure in oral surgery. Impacted teeth often result in various complications and require intervention to alleviate discomfort and prevent further dental issues. The choice of wound closure technique employed after this surgery can have a profound impact on postoperative outcomes. Tooth impaction occurs when a tooth fails to attain its normal functional position.[1] This condition can arise due to several factors, including a lack of space in the dental arch, improper positioning, an abnormal eruption pathway, or obstruction from another tooth. These issues often necessitate surgical intervention to prevent associated complications, such as pain, infection, or damage to adjacent teeth.[2] Surgical extraction is most commonly indicated for impacted mandibular wisdom teeth that exhibit unrestorable caries, recurrent pericoronitis, or as a preventive measure against potential cyst or tumor formation. The extraction of these teeth is not only a common dental procedure but also a necessary one to maintain oral health.[3] The extraction of mandibular third molars is particularly significant due to its high prevalence and the various complications that may arise post-surgery. Patients frequently experience significant pain, swelling, and limited mouth opening (trismus) in the days following the procedure. These sequelae can vary in intensity and duration, impacting the patient's recovery experience and overall satisfaction with the surgical outcome. The choice of suturing technique is believed to play a critical role in the severity of postoperative sequelae. Opinions among dental professionals differ regarding which technique is most effective in minimizing these complications. The traditional method of primary closure, which involves suturing the wound, is widely practiced due to its benefits in promoting rapid healing and reducing the risk of wound contamination. However, an emerging approach, known as the sutureless or non-closure technique, has gained attention for its potential advantages. This technique is thought to facilitate bidirectional drainage of inflammatory exudate, which may help reduce swelling and pain.[4] While this sutureless method is relatively new and gaining recognition among practitioners, its acceptance has not reached the expected level within the dental community. As it stands, there remains insufficient evidence to conclusively determine which technique—complete closure or sutureless—yields better outcomes in terms of pain, swelling, and trismus following the extraction of impacted mandibular third molars.[5] This article provides an overview of the postoperative sequelae following surgical extraction of impacted mandibular third molars, comparing complete closure techniques with sutureless approaches.

Review of literature

In a randomized clinical study by Benedict Chimezie Chukwuma involving 74 participants undergoing impacted mandibular third molar extractions, the sutureless technique group experienced significantly higher postoperative pain on days 1, 3, 4, and 5, while showing less trismus on day 7 compared to the complete closure group. There was no significant difference in swelling between the two groups. Overall, the sutureless group exhibited similar

swelling severity, reduced trismus, but increased pain following the surgery.[6] In a randomized, non-blinded study by Sarah Takadoum involving 100 patients undergoing impacted third molar extractions, no significant differences were found between the suture and sutureless groups regarding pain, swelling, trismus, painkiller consumption, healing, complications, or quality of life after surgery. The study concluded that sutureless extraction is a reliable technique that does not negatively impact outcomes and reduces operating time, while smoking was identified as a risk factor for increased postoperative complications.[7] In a study by Saleh Alkadi, the use of a suture technique for lower third molar surgery was found to be superior to the sutureless technique in reducing postoperative pain and enhancing wound healing during the early recovery period. This suggests that sutures may provide better outcomes in terms of managing discomfort and promoting healing following the extraction of lower third molars. Alkadi et al. suggested that the increased pain in the sutureless group could be attributed to delayed wound healing, resulting in a longer duration of discomfort and continuous pain compared to the partial closure technique used in his study.[8] In contrast, Mahat et al. found no significant difference in average pain levels between the primary closure and sutureless groups. Additionally, other studies have indicated that the sutureless approach may lead to reduced pain.[9] Osunde and Kazemian reported less pain in the sutureless group, proposing that postoperative pain may stem from the pressure created by trapped inflammatory exudate in the complete closure technique.[10,11] They argued that allowing an exit pathway for this exudate would likely result in lower postoperative pain levels.

Postoperative Pain

Despite the administration of analgesics, postoperative pain remains a prevalent complaint among patients following M3 extraction. Severe pain can adversely affect a patient's quality of life, lead to decreased satisfaction with dental care, foster a lack of confidence in dental practitioners, and even contribute to dental anxiety. Pain is inherently subjective, and its intensity is best articulated by the patient themselves. The study noted that the highest pain intensity scores were recorded within the first 48 hours post-surgery for both groups, which aligns with previous research indicating that peak pain severity can occur anywhere from six hours to two days after the procedure. This underscores the necessity for improved pain management strategies in M3 surgery.[12] Given the subjective nature of pain perception, a standardized analgesic regimen may not suffice. Instead, pain management should be personalized, with medications adjusted according to the individual patient's pain levels and their need for additional relief, especially during the critical first 48 hours post-surgery. Several studies have shown that the sutureless technique is associated with significantly greater postoperative pain compared to the complete closure technique. This increased pain in the sutureless approach may be due to the underlying tissues being exposed to the oral environment, which can trigger the release of inflammatory cytokines and pain mediators.[13] Furthermore, this exposure can activate peripheral pain receptors, specifically A-delta and C-nociceptor fibers. Conversely, the complete closure method acts as a protective barrier for the oral mucosa against irritants, resulting in reduced activation of nociceptors and subsequently lower pain levels.[14] Some researchers have also suggested that the prolonged discomfort and delayed wound healing associated with the sutureless technique may further contribute to the increased pain experienced.[15]

Facial Swelling:

Facial swelling is a common source of discomfort following M3 surgery, particularly for patients who are not familiar with the procedure, and it can affect their overall recovery experience. Notably, while some studies indicate that the sutureless technique results in slightly less swelling than the complete closure method, this finding aligns with earlier research and suggests that both techniques may permit some drainage of inflammatory exudates, thus mitigating postoperative swelling. Even with complete closure, small gaps, such as those found in gingival crevices, can still serve as pathways for fluid escape during the inflammatory phase. The mechanism of postoperative swelling in M3 surgery is generally characterized by hyperemia, vasodilation, and increased capillary permeability, which leads to fluid accumulation in the surrounding tissues. Although fluid accumulation occurs with both techniques, the sutureless approach may promote quicker drainage compared to the complete closure technique. This indicates that the choice of suturing method may not significantly affect the overall severity of postoperative swelling, a perspective supported by some authors who prefer complete closure.[16,17]

Trismus:

Trismus, or restricted mouth opening, often results from local tissue inflammation and muscle involvement after M3 surgery.[18] Several studies consistently show that trismus severity is higher in the complete closure group compared to the sutureless group during the evaluated postoperative days. This implies that patients who undergo the sutureless technique may experience a quicker recovery, regaining near preoperative mouth-opening abilities sooner than those who receive complete closure. This finding indicates that suturing techniques can indeed influence the severity of postoperative trismus, which is frequently linked to the inflammatory response resulting from the surgery. Increased swelling in the complete closure group likely contributes to heightened trismus, a situation potentially worsened by the physical restrictions imposed by the sutured tissue.[19] The suturing process can pull the buccal and lingual mucosa together, creating tension that may limit movement and result in a sensation of tightness around the surgical site.[20]

Complete Closure (Sutures)	**Sutureless Techniques**
• **Advantages:** ○ Can provide better hemostasis, reducing bleeding.	• **Advantages:** ○ Generally less painful and uncomfortable.

○ May promote faster healing and reduce the risk of infection. ○ Can help maintain the integrity of the surgical site. • **Disadvantages:** ○ May cause discomfort or irritation. ○ Requires additional time and skill for placement. ○ Can lead to suture abscesses if not properly cared for.	○ Does not require additional time or skill for placement. ○ May reduce the risk of suture-related complications. • **Disadvantages:** ○ May result in slower healing or increased risk of infection, especially in complex cases. ○ Can lead to delayed wound closure or tissue dehiscence.

Conclusion

While sutureless techniques may offer benefits in specific contexts, the overall effectiveness in minimizing complications remains a subject for further investigation. The choice between complete closure and sutureless techniques following impacted third molar extraction is often based on the surgeon's preference, the patient's individual needs, and the complexity of the case. While both techniques have their advantages and disadvantages, there is no definitive evidence to suggest that one is superior to the other in terms of overall postoperative outcomes.

References

1. Leif L. Current concepts and strategies for third molar impaction. In: Anderson L, Kahnberg K-E, Pogrel MA, editors. Oral and Maxillofacial Surgery. John Wiley & Sons; 2012. pp. 195–218.
2. Sortino F, Cicciù M. Strategies used to inhibit postoperative swelling following removal of impacted lower third molar. Dent Res J (Isfahan) 2011;8:162–71.
3. Sortino F, Messina G, Pulvirenti G. [Evaluation of postoperative mucosa and skin temperature after surgery for impacted third molar] Minerva Stomatol. 2003;52:393–9.
4. Osunde OD, Saheeb BD, Adebola RA. Comparative study of effect of single and multiple suture techniques on inflammatory complications after third molar surgery. J Oral Maxillofac Surg. 2011;69:971–6.
5. 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] Rev Stomatol Chir Maxillofac Chir Orale.
6. Chukwuma, Benedict & Taiwo, Abdurrazaq & Akinmoladun, Victor & Ibikunle, Adebayo & Bala, Mujtaba. (2022). Postoperative Sequelae Following Surgical Extraction of Impacted Mandibular Third-Molar Extraction Using the Complete Closure Versus the Sutureless Techniques. Journal of the West African College of Surgeons. 12. 12-19. 10.4103/jwas.jwas_191_22.
7. Takadoum, S., Douilly, G., de Boutray, M. et al. Sutureless socket technique after removal of third molars: a multicentric, open, randomized controlled trial. BMC Oral Health 22, 256 (2022). https://doi.org/10.1186/s12903-022-02287-y
8. Saleh Alkadi, Leo Stassen,,Effect of One-Suture and Sutureless Techniques on Postoperative Healing After Third Molar Surgery,Journal of Oral and Maxillofacial Surgery,Volume 77, Issue 4, 2019, Pages 703.e1-703.e16
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. Int J Oral Maxillofac Surg. 2012;41:1275–9.
10. Mahat AK, Yadav R, Yadav AK, Acharya P, Dongol A, Sagtani A, et al. A comparative study of the effect of sutureless versus multiple sutures technique on complications following third molar surgery in Nepalese subpopulation. Int J Dent
11. Kazemian M, Eshghpour M, Ilkhani S, Ghadirimoghaddam N. The effect of sutureless surgery on postoperative pain and swelling following mandibular third molar surgery. JDMT. 2016;5:63–7.
12. Azab, Maria et al.Efficacy of secondary vs primary closure techniques for the prevention of postoperative complications after impacted mandibular third molar extractions,The Journal of the American Dental Association, Volume 153, Issue 10, 943 - 956.e48
13. Evangelos, Kostares., Georgia, Kostare., Michael, Kostares., Athanassios, Tsakris., Μαρία, Καντζάνου. (2024). 1. Prevalence of Surgical Site Infections Following Extraction of Impacted Mandibular Third Molars: A Systematic Review and Meta-Analysis. Journal of Stomatology, Oral and Maxillofacial Surgery, doi: 10.1016/j.jormas.2024.101995

14. Farzana, Kalsoom., Labiba, Hassan., Usman, Qadir, Khan., Hajra, Soomro., Sobia, Siddique., Kanza, Nawadat. (2023). 9. Post-Operative Complications Associated with Impacted Mandibular Third Molar Removal. Annals of Punjab Medical College, doi: 10.29054/apmc/2023.1390

15. Massimo, Albanese., A, Zangani., Federica, Manfrin., Dario, Bertossi., R., De, Manzoni., N., Tomizioli., Paolo, Faccioni., Alessia, Pardo. (2023). 10. Influence of Surgical Technique on Post-Operative Complications in the Extraction of the Lower Third Molar: A Retrospective Study. Dental journal, doi: 10.20944/preprints202308.1748.v1

16. Damodar ND, Nandakumar H, Srinath NM. Postoperative recovery after mandibular third molar surgery: A criteria for selection of type of surgical site closure. *Gen Dent.* 2013;61:e9–e13.

17. Quadri A, Quadri S, Khan T. Comparative study of post-operative complications in third molar surgery with and without sutures: A prospective study. *Int J Sci Stud.* 2016;4:168–71.

18. Anighoro E, Gbotolorun O, Adewole R, Arotiba G, Effiom O. Assessment of the effect of wound closure technique on postoperative sequaele and complications after impacted mandibular third molar extraction. *Open J Stomatol.* 2013;3:527–32.

19. Gunay, Gojayeva., G., Tekin., Nesrin, Saruhan, Kose., Omur, Dereci., Yasin, Çağlar, Koşar., Gizem, Caliskan. (2024). 7. Evaluation of complications and quality of life of patient after surgical extraction of mandibular impacted third molar teeth. BMC Oral Health, doi: 10.1186/s12903-024-03877-8

20. Andra, Rizqiawan., Yeni, Dian, Lesmaya., Anindita, Zahratur, Rasyida., Muhammad, Subhan, Amir., Shigehiro, Ono., David, B., Kamadjaja. (2022). 20. Postoperative Complications of Impacted Mandibular Third Molar Extraction Related to Patient's Age and Surgical Difficulty Level: A Cross-Sectional Retrospective Study. International Journal of Dentistry, doi: 10.1155/2022/7239339