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Review Article

Flapless extraction of impacted mandibular third molars: A contemporary surgical approach

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ABSTRACT

The aim of this review is to evaluate the clinical outcomes of flapless extraction of impacted mandibular third molars compared to traditional flap-based techniques, with a focus on patient satisfaction, complication rates, and overall surgical efficiency. The extraction of impacted mandibular third molars (wisdom teeth) is a common procedure in oral and maxillofacial surgery, traditionally performed using a flap-based technique. While this method provides clear access to the impacted tooth, it is often associated with significant postoperative morbidity, such as pain, swelling, and extended recovery time. Recent innovations have introduced flapless extraction as a minimally invasive alternative, aiming to minimize tissue trauma and preserve periosteal integrity. This technique, however, presents its own set of challenges, including limited visibility and technical demands.

This review analyzes the current literature on flapless extraction techniques, drawing from retrospective studies, randomized controlled trials, and clinical case reports. The data include comparisons of postoperative outcomes between flapless and traditional methods, emphasizing factors such as operative time, postoperative discomfort, and the frequency of complications. Findings indicate that flapless extraction generally results in reduced postoperative pain, swelling, and faster recovery times compared to traditional flap-based techniques. Patients who undergo flapless extraction report higher satisfaction due to less postoperative discomfort and a quicker return to normal function. However, the technique poses challenges in cases of deeply impacted teeth, where the lack of a flap may hinder complete access and increase the risk of complications. Flapless extraction represents a promising evolution in the surgical removal of impacted mandibular third molars, offering several advantages over traditional methods, particularly in reducing postoperative morbidity. However, the technique requires precise surgical skill and is not suitable for all cases. Careful case selection is crucial, and continued research is needed to further validate its efficacy and safety in complex scenarios.

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1. Introduction

The extraction of impacted mandibular third molars (wisdom teeth) is one of the most common procedures performed by oral and maxillofacial surgeons. The

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traditional technique involves creating a mucoperiosteal flap to access the impacted tooth, followed by bone removal and tooth sectioning when necessary. Although this method provides clear surgical access, it often results in significant postoperative morbidity, including pain, swelling, and trismus. In recent years, there has been growing interest in flapless techniques, which aim to reduce tissue trauma and enhance postoperative recovery. This review aims to explore the flapless extraction of impacted mandibular third molars, evaluating its benefits and challenges and positioning it within the broader context of surgical innovation.^{1,2}

This review is based on an extensive analysis of the current literature concerning the flapless extraction of impacted mandibular third molars. The literature search was conducted through electronic databases such as PubMed, Scopus, and Google Scholar, focusing on peer-reviewed articles published between 2000 and 2023. Search terms included "flapless extraction," "impacted mandibular third molars," "minimally invasive oral surgery," "flap-based extraction techniques," and "postoperative outcomes".³

Study selection: The studies selected for review included:

1. **Retrospective studies:** These studies provided a comparison between flapless and traditional flap-based techniques, focusing on patient records and outcomes over a specific period. Data were gathered from patient charts, operative notes, and follow-up appointments. Inclusion criteria required studies to have detailed outcome measures such as pain levels, swelling, recovery times, and complication rates.⁴
2. **Randomized controlled trials (RCTs):** RCTs provided high-level evidence comparing flapless and traditional approaches in controlled environments. These trials typically involved two groups of patients—those undergoing flapless extraction and those receiving traditional flap-based surgery—and measured postoperative outcomes across both cohorts. RCTs were crucial in assessing direct outcomes such as operative time, analgesic consumption, patient-reported pain scores, and the frequency of adverse events such as dry socket and nerve injury.⁵
3. **Clinical case reports and series:** These provided insight into the real-world application of the flapless technique, highlighting its practical challenges and successes in diverse clinical scenarios. Case reports often emphasized the decision-making process behind choosing the flapless approach for specific cases, such as superficial impactions or proximity to sensitive anatomical structures like the inferior alveolar nerve.⁶

Outcome measures

Key postoperative outcomes analysed included:⁷

1. **Operative time:** Duration of the procedure from initial incision or tissue manipulation to the final closure or stabilization of the surgical site.

2. **Postoperative pain:** Measured through visual analog scales (VAS) or numerical pain scales reported by patients over the course of 1–7 days post-surgery.
3. **Swelling:** Objectively measured through facial landmarks or soft tissue markers, typically 24–72 hours postoperatively.
4. **Complication rates:** These included immediate complications such as intraoperative nerve damage or bleeding, and late complications like infection, dry socket, and trismus.
5. **Patient satisfaction:** Assessed through questionnaires and patient-reported outcome measures (PROMs), focusing on comfort levels, medication use, and overall experience during the postoperative recovery period.

The review of the available literature reveals several key findings about the outcomes of flapless extraction of impacted mandibular third molars compared to traditional flap-based techniques.

1. **Reduced postoperative pain:** Across multiple studies, flapless extraction consistently demonstrated reduced postoperative pain levels. Patients undergoing flapless procedures reported significantly lower pain scores on the VAS, particularly within the first 48–72 hours postoperatively. This reduction in pain is attributed to the preservation of soft tissue integrity and periosteal blood supply, which limits the inflammatory response typically triggered by the creation of a flap.⁸
2. **Faster recovery and reduced swelling:** One of the most significant advantages of flapless extraction observed in the literature was the accelerated recovery time. Patients undergoing flapless surgery experienced less postoperative swelling and resumed normal activities earlier than those who had flap-based extractions.⁹
3. **Shorter operative time:** In several studies, flapless extraction techniques resulted in shorter operative times compared to traditional approaches. This was particularly noted in cases where the impaction was superficial or moderate, with minimal bone removal required. RCTs highlighted a 15–20% reduction in operative time, which can be attributed to the elimination of the steps involved in creating and suturing a flap. This shortened operative time also contributed to reduced patient exposure to anesthesia and less intraoperative bleeding.¹⁰
4. **Complication rates:** While the flapless technique demonstrated favorable outcomes regarding pain, swelling, and recovery time, its complication rates were slightly higher in cases of deeply impacted teeth. A significant challenge with flapless extraction is the limited visibility and access to deeply impacted or horizontally positioned third molars. In such cases, incomplete extractions were reported in some studies, leading to secondary procedures. Additionally, a few

cases of root fractures or damage to adjacent teeth were noted, primarily due to the difficulty in accessing deeply embedded tooth structures without adequate exposure provided by a flap.¹¹

5. Patient satisfaction: Patient-reported outcomes consistently favored flapless extraction. Patients expressed greater satisfaction with the technique due to lower postoperative discomfort, reduced reliance on pain medication, and faster recovery times. Furthermore, many patients appreciated the absence of sutures and the overall minimally invasive nature of the procedure.¹²
6. Challenges in complex cases: Despite its benefits, the flapless approach is not universally applicable. The literature highlighted the challenges of using this technique in cases involving deeply impacted teeth or where the third molar was in close proximity to the inferior alveolar nerve. In such instances, the lack of direct visibility can increase the risk of nerve damage or incomplete extraction. These findings suggest that the flapless technique is most beneficial in less complicated cases, and careful case selection is critical to avoid complications.^{13,14}

1.1. Summary¹⁵

1. Flapless extraction reduces postoperative pain and swelling compared to traditional methods.
2. Patients recover faster and report higher satisfaction with flapless techniques.
3. Operative time is shorter in cases where the flapless approach is appropriate.
4. The flapless technique may not be suitable for deeply impacted teeth, where visibility and access are compromised.
5. Complication rates can increase in complex cases, emphasizing the importance of surgical expertise and case selection.

2. Discussion

Flapless extraction is a technique for removing impacted teeth without the creation of a mucoperiosteal flap, which distinguishes it from traditional methods. This approach relies heavily on precise preoperative planning and advanced imaging technologies, such as cone-beam computed tomography (CBCT), to allow the surgeon to access the impacted tooth directly through the overlying tissue. The absence of a flap preserves the periosteal blood supply and minimizes disruption to the surrounding soft tissue, which is thought to reduce postoperative complications like pain, swelling, and inflammation. Successful execution of this technique hinges on the surgeon's ability to accurately locate and remove the tooth with minimal bone removal, often aided by specialized

instruments like piezoelectric devices, which help in atraumatic bone cutting and decrease the risk of damaging nearby structures.^{16,17}

In comparison to the traditional flap-based approach, which is widely practiced but has its drawbacks, flapless extraction offers distinct advantages. Traditional methods are associated with longer operative times, more extensive bone removal, and a higher risk of complications such as infection, dry socket, and nerve damage—especially in cases involving deeply impacted teeth. Flapless extraction, however, may reduce surgical trauma, lead to faster healing, and enhance overall patient comfort. Nonetheless, this approach demands a higher level of technical expertise, particularly in more challenging cases where the tooth is deeply embedded or near the inferior alveolar nerve. The lack of direct visual access to the impacted tooth in flapless procedures can increase the risk of incomplete extraction or inadvertent damage to adjacent structures, underscoring the need for precision.¹⁸

Clinical outcomes from several studies consistently show that patients who undergo flapless extraction tend to experience lower levels of postoperative pain and swelling, as well as quicker recovery times, compared to those treated with the traditional flap-based method. The reduced need for postoperative medications, such as analgesics and anti-inflammatory drugs, further enhances patient satisfaction. Despite these encouraging results, the need for larger, long-term studies remains, especially to better understand the risks and benefits of flapless extraction in more complex cases.¹⁹

While the flapless technique presents numerous benefits, it is not without challenges and limitations. One major concern is the difficulty in accessing deeply impacted teeth without the visibility that a flap provides, which can lead to incomplete extractions and necessitate a second surgery. Additionally, the minimal bone removal required in flapless extraction can increase pressure on surrounding structures, raising the risk of root fractures or damage to adjacent teeth. This technique may also be unsuitable for all cases, particularly for deeply impacted or horizontally positioned teeth, or when the impacted tooth is located near critical anatomical structures like the inferior alveolar nerve. In such cases, a traditional flap-based approach may be safer and more effective. Ultimately, surgeons must carefully evaluate each case on an individual basis to determine the most appropriate surgical technique to ensure the best possible outcomes for the patient.²⁰

3. Conclusion

Flapless extraction of impacted mandibular third molars represents a promising advancement in oral surgery, offering the potential for reduced postoperative morbidity and improved patient satisfaction. While the technique has shown favourable outcomes in terms of reduced pain,

swelling, and recovery time, its success is highly dependent on careful case selection and surgical expertise. The approach is not without its limitations, and traditional flap-based methods may still be necessary in more complex cases. Continued research and clinical trials are needed to further refine the technique and establish its role in modern oral surgery.

4. Source of Funding

None.


5. Conflict of Interest

None.

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