

RISK FACTORS FOR POSTOPERATIVE COMPLICATIONS FOLLOWING THE EXTRACTION OF IMPACTED THIRD MOLARS

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Abstract. *Impacted third molar extraction is a common procedure in oral and maxillofacial surgery, yet postoperative complications may affect recovery and quality of life. Common outcomes include pain, swelling, trismus, alveolar osteitis, surgical site infection, bleeding, and neurosensory disturbances. This article aims to examine the principal risk factors associated with complications following the removal of impacted third molars. A narrative review approach was used to consider evidence on patient-related characteristics, anatomical and radiological findings, surgical complexity, and preventive strategies. The reviewed literature suggests that smoking, pre-existing inflammation, medical conditions, medication use, tooth angulation, impaction depth, root morphology, and proximity to adjacent anatomical structures may influence specific postoperative outcomes.*

Keywords: *Postoperative complications, risk factors, alveolar osteitis, surgical infection, oral and maxillofacial surgery.*

Introduction

The surgical extraction of impacted third molars is one of the most frequently performed procedures in oral and maxillofacial surgery. Partial or complete retention of wisdom teeth within the jawbone or surrounding soft tissues, together with abnormal positioning and insufficient space for eruption, may lead to various clinical problems. These conditions can contribute to pain, local inflammation, damage to adjacent teeth, and pathological changes in periodontal tissues. Consequently, surgical removal of impacted third molars may be necessary in selected patients to prevent or manage these complications. Despite the routine nature of this procedure, various complications may develop during the postoperative period. The most common include pain, facial swelling, restricted mouth opening, alveolar osteitis, surgical site infection, postoperative bleeding, and neurosensory disturbances. In some cases, the close relationship between the roots of mandibular third molars and the inferior alveolar nerve may result in altered sensation affecting the lower lip, chin, or tongue. Such complications can interfere with daily activities, eating, oral hygiene, and overall quality of life. The occurrence of postoperative complications is influenced by several interrelated factors. Patient-related characteristics, including age, general health status, smoking habits, oral hygiene, and pre-existing inflammation, may affect the healing process. Anatomical characteristics, such as the depth and angulation of impaction, root morphology, and the proximity of the tooth to adjacent anatomical structures, may increase surgical complexity. Furthermore, the duration of the procedure, the extent of bone removal, the degree of tissue manipulation, and the surgeon's experience may influence postoperative recovery. Understanding these factors is essential for identifying patients who may require additional precautions and individualized treatment planning.

Aim

The aim of this article is to analyze the principal risk factors associated with postoperative complications following the extraction of impacted third molars, focusing on patient-related characteristics, anatomical and surgical factors, and their clinical significance in the prevention and management of adverse postoperative outcomes.

Main part

The occurrence of postoperative complications following impacted third molar extraction is influenced by several patient-related characteristics. Age is an important consideration because bone density, tissue healing, and surgical complexity may vary among individuals. The patient's general health status should be assessed before the procedure to identify conditions that may interfere with recovery. Diabetes mellitus, particularly when poorly controlled, may impair wound healing and increase susceptibility to infection. Smoking is another relevant risk factor associated with an increased likelihood of alveolar osteitis and delayed healing. Tobacco exposure may negatively affect the local healing environment and the stability of the blood clot within the extraction socket. Poor oral hygiene may contribute to local inflammation and increase the importance of appropriate postoperative care. Pre-existing pericoronitis should be considered during clinical examination because inflammation around an impacted tooth may complicate treatment. Medication history is also important, particularly in patients taking anticoagulants or immunosuppressive drugs. Certain medications and systemic conditions may require additional precautions during surgical planning. Oral contraceptive use has also been investigated as a factor associated with alveolar osteitis following third molar extraction. However, the relationship between individual risk factors and postoperative outcomes varies across studies. Previous dental complications may provide useful information when assessing a patient's individual risk profile. Patients should receive clear instructions regarding oral hygiene, smoking avoidance, prescribed medication, and postoperative follow-up. Medical history and clinical findings should be evaluated together rather than independently. Appropriate preoperative counselling may improve patient understanding and cooperation. Identifying modifiable risk factors allows clinicians to introduce preventive measures when appropriate.

The anatomical characteristics of impacted third molars play a significant role in determining surgical difficulty and the potential for postoperative complications. The depth of impaction influences surgical accessibility and the amount of bone that may need to be removed. The angulation of the tooth can affect the direction and complexity of extraction. Mesioangular, distoangular, horizontal, and vertical impactions may require different surgical approaches. Root morphology is another important consideration because curved, divergent, or unusually shaped roots can complicate tooth removal. The number and configuration of roots may influence the need for tooth sectioning during surgery. The relationship between the impacted tooth and the adjacent second molar should also be evaluated. Close anatomical relationships may increase the risk of damage to neighbouring teeth or periodontal tissues. In mandibular third molar surgery, the proximity of the roots to the inferior alveolar canal requires particular attention. Injury to the inferior alveolar nerve may result in altered sensation affecting the lower lip and chin. The lingual nerve may also be at risk during certain surgical approaches. Panoramic radiography is commonly used to assess tooth position, root morphology, and surrounding anatomical structures. In selected cases, cone-beam computed tomography may provide additional three-dimensional information. Additional imaging should be used when it is expected to improve clinical decision-making. The position of maxillary third molar roots in relation to the maxillary sinus is also clinically relevant. A close relationship may increase the possibility of oroantral communication during extraction. Limited mouth opening and restricted surgical access may further increase procedural difficulty. Radiological findings should be interpreted alongside clinical examination and the patient's symptoms.

Surgical factors can influence tissue trauma, postoperative inflammation, and the duration of recovery following impacted third molar extraction. The selection of an appropriate surgical technique should be based on clinical examination and radiological findings. The surgeon's experience may be particularly relevant when managing deeply impacted teeth or complex root configurations. Extensive tissue manipulation may contribute to postoperative pain, swelling, and

delayed recovery. The amount of bone removal required during extraction can also reflect the complexity of the procedure. In selected cases, tooth sectioning may facilitate removal and reduce the need for excessive force. However, the choice of technique should be individualized according to the anatomical characteristics of the tooth. The duration of surgery may be associated with procedural difficulty and the extent of tissue manipulation. Appropriate flap design helps provide access while avoiding unnecessary damage to surrounding tissues. Careful handling of adjacent teeth and anatomical structures is essential throughout the procedure. Effective haemostasis supports the formation and preservation of a stable blood clot within the extraction socket. Appropriate aseptic technique is important for reducing the risk of surgical site infection. Postoperative pain should be assessed and managed according to the patient's clinical condition. Patients should receive clear instructions concerning oral hygiene, diet, smoking avoidance, and wound care. Antibiotics should be prescribed according to clinical indications rather than used routinely in every patient. Follow-up examinations help identify abnormal healing and complications that require additional treatment. Increasing pain, progressive swelling, fever, purulent discharge, persistent bleeding, or altered sensation should prompt clinical reassessment. Alveolar osteitis, infection, and neurosensory disturbances require different management strategies.

Conclusion

Postoperative complications following the extraction of impacted third molars remain an important clinical concern in oral and maxillofacial surgery. Their occurrence is influenced by a combination of patient-related, anatomical, radiological, and surgical factors. Smoking, pre-existing inflammation, general health status, depth and angulation of impaction, root morphology, and proximity to adjacent anatomical structures should be considered during preoperative assessment. The complexity of the surgical procedure and the extent of tissue manipulation may also influence postoperative recovery. A comprehensive evaluation of individual risk factors can help clinicians anticipate potential complications and select an appropriate surgical approach. Careful operative technique, adequate patient education, appropriate postoperative care, and regular follow-up are important for promoting healing and identifying adverse outcomes at an early stage. Particular attention should be given to alveolar osteitis, surgical site infection, postoperative bleeding, and neurosensory disturbances.

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