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CONTEMPORARY APPROACHES TO THE PREVENTION OF INFLAMMATORY COMPLICATIONS IN MANDIBULAR FRACTURES

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Abstract
Mandibular fractures, characterized by disruption of the structural integrity of the lower jaw, represent severe traumatic injuries that may pose significant risks to patient health. These injuries result in substantial anatomical and physiological alterations within the affected region. One of the most common and clinically significant complications associated with mandibular fractures is inflammation. Inflammatory processes complicate both systemic and local therapeutic management, prolong the duration of treatment, and negatively influence patients' functional recovery and social activity. Therefore, the prevention of inflammatory complications following mandibular fractures remains a critical challenge in contemporary maxillofacial surgery. This article reviews modern preventive strategies, including antibiotic prophylaxis, antiseptic and hygienic measures, minimally invasive surgical techniques, physiotherapeutic interventions, and the application of innovative biomaterials aimed at improving clinical outcomes and accelerating recovery.
Keywords: Mandibular fracture, inflammatory complications, prevention, modern therapeutic approaches, antibiotic prophylaxis, physiotherapy, antiseptic treatment, oral hygiene, reconstructive surgery.

Introduction

The prevention of inflammatory complications following mandibular fractures remains an important and highly relevant issue in modern maxillofacial surgery. Advances in medical technologies and therapeutic strategies have contributed to significant improvements in the management of traumatic jaw injuries. The implementation of innovative diagnostic and treatment approaches not only reduces the incidence of complications but also promotes faster functional recovery of the mandible.
Inflammatory complications in mandibular fractures may arise due to several factors. One of the primary causes is the failure to strictly adhere to aseptic and antiseptic principles during surgical intervention, which increases the risk of infection. Additionally, impaired blood circulation in the fracture region, inadequate repositioning of bone fragments, the presence of foreign bodies, or necrotic tissue may further contribute to the development of inflammatory processes.

Preventive Strategies

Strict adherence to sanitary and hygienic protocols, regular oral cavity cleansing, professional dental hygiene procedures, and appropriate antibiotic prophylaxis represent fundamental

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measures in preventing inflammatory complications.
The rational selection and administration of antibiotics, taking into account the individual characteristics of the patient and the microbial profile of the infection, constitute an essential component of modern preventive strategies. The use of broad-spectrum antibiotics and advanced local antiseptic agents has significantly improved the effectiveness of infection control.

Modern Surgical and Technological Approaches
Minimally invasive surgical techniques for the management of mandibular fractures—such as the repositioning and fixation of bone fragments through small access points—have gained increasing popularity in contemporary clinical practice. Due to their minimally traumatic nature, these procedures reduce damage to surrounding soft tissues and preserve local blood circulation, thereby lowering the risk of postoperative inflammation.
The use of innovative titanium fixation systems and bioabsorbable osteosynthesis materials further enhances treatment outcomes by ensuring stable fixation of bone fragments, preventing secondary displacement, accelerating bone healing, and minimizing the risk of infectious complications.

Postoperative Monitoring and Adjunctive Therapies
Patients with mandibular fractures require continuous postoperative monitoring and regular dental examinations. Dynamic follow-up, combined with individualized preventive measures and modern therapeutic approaches, allows clinicians to significantly reduce the incidence of inflammatory complications.
Physiotherapeutic methods such as laser therapy, ultrasound therapy, and magnetotherapy stimulate reparative processes in damaged tissues, reduce edema and pain, and promote optimal healing of both bone and soft tissues.

Conclusion
In conclusion, the prevention of inflammatory complications associated with mandibular fractures represents one of the most significant challenges in contemporary oral and maxillofacial surgery. A systematic and multidisciplinary approach based on modern scientific achievements and advanced medical technologies is required to address this issue effectively. Through comprehensive preventive measures, accurate diagnosis, and advanced treatment strategies, the incidence of post-traumatic inflammatory complications can be significantly reduced, thereby improving clinical outcomes and enhancing patients' quality of life.

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