

MODERN STRATEGIES FOR THE TREATMENT OF ODONTOGENIC INFECTIONS IN THE MAXILLOFACIAL REGION

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Abstract. *The article examines contemporary approaches to the treatment of odontogenic infections in the maxillofacial region, focusing on elimination of the infection source, surgical drainage, antibiotic therapy, and antimicrobial resistance. The reviewed literature consistently identifies source control and timely drainage as central components of treatment. Antibiotic selection and duration, however, depend on infection severity, systemic involvement, the anatomical spaces affected, and the patient's clinical response. The review summarises key treatment components and identifies areas where stronger clinical evidence is needed.*

Keywords: *odontogenic infection, maxillofacial region, surgical drainage, antibiotic therapy, antimicrobial resistance, fascial spaces, antibiotic stewardship.*

Introduction

Odontogenic infections arise from teeth and their supporting tissues and commonly present as dentoalveolar infections or abscesses. Without timely treatment, infection may extend into the fascial spaces of the face and neck. In severe cases, this spread can cause airway compromise, sepsis, necrotising fasciitis, descending mediastinitis, or cavernous sinus thrombosis. These complications make early recognition and appropriate treatment important components of oral and maxillofacial care. Management requires more than prescribing antimicrobial medication. The clinician must identify and eliminate the source of infection, determine whether drainage is needed, assess the anatomical extent of the process, and evaluate signs of systemic illness. The choice of treatment should be guided by the patient's clinical condition and the possibility of complications. Severe infections may require hospital admission, intravenous therapy, airway assessment, and coordinated care. Antibiotics can be beneficial when there is systemic involvement, spreading infection, deep fascial-space involvement, or other clinical indications. However, antibiotics alone may be insufficient when an abscess requires drainage or the causative tooth remains untreated. Inappropriate or unnecessarily prolonged antimicrobial use can contribute to adverse effects and antimicrobial resistance. A balanced strategy therefore combines timely source control with judicious use of antibiotics.

Relevance

Odontogenic infections remain a clinically important problem because their progression can be rapid and their consequences may be serious. Treatment decisions are complicated by differences in infection severity, anatomical location, patient risk factors, and response to initial intervention. Although source control and drainage are widely recognised as essential, the optimal role, choice, and duration of antibiotic therapy are not uniform across all clinical situations.

Aim

To review contemporary treatment strategies for odontogenic infections in the maxillofacial region, with emphasis on source control, surgical drainage, antibiotic use, antimicrobial resistance, and factors that influence treatment selection.

Materials and Methods

This study was designed as a narrative literature review of published research on the treatment of odontogenic infections in the maxillofacial region. The review focused on systematic reviews, narrative reviews, bibliometric analyses, and clinical studies addressing source control, drainage techniques, antimicrobial treatment, treatment duration, and antimicrobial resistance.

Relevant literature was identified by considering publications whose titles, abstracts, or stated aims addressed odontogenic infections, dentoalveolar abscesses, maxillofacial space infections, surgical drainage, systemic antibiotic therapy, or antimicrobial resistance. The reference list supplied for this review included publications from international scientific journals, including systematic reviews and clinical investigations. The search approach was topic-focused rather than a fully systematic search protocol.

Studies were considered relevant when they discussed one or more of the following: (1) removal or treatment of the odontogenic source; (2) indications and approaches for incision and drainage; (3) antibiotic selection or duration; (4) management of infections involving deep fascial spaces or systemic symptoms; and (5) antimicrobial resistance or principles of rational prescribing. Publications addressing general dental antibiotic use were considered when their findings were applicable to odontogenic infections.

The review did not apply a pooled statistical analysis or meta-analysis. Instead, findings were compared qualitatively and grouped according to the main treatment components. Particular attention was paid to the consistency of recommendations across reviews and clinical studies, the clinical setting in which the findings were reported, and limitations noted by the original authors.

Results

The literature reviewed indicates that treatment is most effective when it addresses the cause of infection rather than relying on antibiotics alone. The causative tooth or other odontogenic source should be treated or removed when clinically indicated. When a collection of pus is present, incision and drainage are central measures for reducing the infectious burden. The route and extent of drainage depend on the location and severity of infection and the patient's overall condition. For localised infections that can be drained adequately, treatment may be managed with a relatively short course of antibiotics when antimicrobial therapy is indicated. However, duration should not be applied as a fixed rule to every patient. Deep-space infection, systemic symptoms, incomplete source control, immunocompromising conditions, or an unsatisfactory clinical response may require a different plan, closer observation, and specialist or hospital-based management. The reviewed studies describe variation in clinical improvement timelines. Some patients show improvement within the first few days after adequate drainage and source control, whereas more extensive infections may take longer to resolve. Clinical response should be assessed through changes in pain, swelling, fever, mouth opening, swallowing, and other relevant findings. Deterioration or failure to improve should prompt reassessment for inadequate drainage, continued infection source, spread into additional spaces, or complications.

Antibiotic choice should reflect the likely microbial profile, infection severity, allergy history, comorbidities, local guidance, and relevant resistance patterns. Narrow-spectrum treatment is preferable when appropriate, while broad-spectrum therapy should be reserved for situations in which the clinical presentation justifies it. Antibiotic prescribing should be reviewed as the patient's condition evolves, and treatment should be adjusted according to clinical findings and microbiological results when available.

The evidence also highlights limitations in the literature. Studies differ in definitions of severity, drainage methods, antibiotic regimens, outcome measures, and follow-up periods. These differences make direct comparison difficult and limit the ability to define a single optimal duration of antibiotic therapy for all odontogenic infections.

Conclusion

Modern management of odontogenic infections in the maxillofacial region relies on timely identification and elimination of the infection source, appropriate surgical drainage, and judicious antibiotic use. Antibiotics should complement-not replace-source control when drainage or treatment of the causative tooth is required. The choice and duration of antimicrobial therapy should be guided by infection severity, systemic involvement, patient-specific factors, local recommendations, and clinical response. Early recognition of deep-space or systemic infection is essential to prevent serious complications. Further high-quality studies using standardised methods are needed to clarify optimal antibiotic regimens and improve consistency in clinical decision-making.

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