Odontogenic Infections

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KEYWORDS

• Dental infections • Dental abscess • Microbiota of dental infections

KEY POINTS

- The pathogenesis of odontogenic infection is polymicrobial, consisting of various facultative and strict anaerobes. The dominant isolates are strictly anaerobic gram-negative rods and gram-positive cocci. The periapical infection is the most common form of odontogenic infection.
- Although odontogenic infections are usually confined to the alveolar ridge vicinity, they can spread into deep fascial spaces.
- Cavernous sinus thrombosis, brain abscess, airway obstruction, and mediastinitis are possible complications of dental infections.
- The most important element in treating odontogenic infections is the elimination of the primary source of the infection with antibiotics as adjunctive therapy.

INTRODUCTION

An odontogenic infection is an infection of the alveolus, jaws, or face that originates from a tooth or from its supporting structures and is one of the most frequently encountered infections. The most common causes of odontogenic infections are dental caries, deep fillings or failed root canal treatment, pericoronitis, and periodontal disease. The infection starts locally around a tooth and may remain localized to the region where it started, or may spread into adjacent or distant areas. The course of the infection depends on the virulence of the bacteria, host resistance factors, and the regional anatomy.

The periapical infection is the most common form of odontogenic infection and is caused by invasion of the root canal system of the tooth by microorganisms. This acute apical infection entails a concomitant infection of the root canal and the periradicular tissues, because the latter is an extension of the former. Once the microorganisms enter the periapical tissues via the apical foramen, they induce an inflammatory process that can lead to the formation of an abscess. In most cases the infection is

The author has nothing to disclose.
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Dent Clin N Am 61 (2017) 235–252
http://dx.doi.org/10.1016/j.cden.2016.11.004 **dental.theclinics.com**

localized intraorally, but in some instances it may spread into distal areas and result in severe complications, such as sinusitis, airway obstruction, cavernous sinus thrombosis, brain abscess, or even death.

Pericoronitis is another common cause of odontogenic infection. The primary cause is the accumulation of bacteria and food debris that gets trapped in the space between the overlapping gum of a partially exposed (erupted) mandibular third molar and the crown of the tooth. Most cases are chronic and consist of a mild persistent inflammation of the mandibular third molar area. Pericoronitis can, however, become a serious infection associated with fever, swelling, and an abscess that has the ability to spread if left untreated. On occasions the symptoms can become severe because of the rapid spread of infection, requiring that the patient be hospitalization for intravenous (IV) antibiotics and possibly extraction of tooth in an operating room under general anesthesia. Because of the close proximity to the pharynx, airway obstruction becomes a strong possibility.

CLINICAL PRESENTATIONS

The clinical presentation of an odontogenic infection is highly variable depending on the source of the infection (anterior teeth vs posterior teeth; maxillary vs mandibular teeth), whether the infection is localized or if it has become disseminated (Table 1). Like all infections, the clinical signs and symptoms are pain/tenderness, redness, and swelling. Patients with superficial dental infections present with localized pain, cellulitis, and sensitivity to tooth percussion and temperature. However, patients with deep infections or abscesses that spread along the fascial planes may present with swelling; fever; and sometimes difficulty swallowing, opening the mouth, or breathing (Fig. 1). In single space infection cases the most commonly involved fascial space is the buccal space (60%) (Fig. 2), followed by canine space (13%) (Fig. 3). In

Table 1
Clinical presentation of odontogenic infections by location

Type of Infection	Clinical Presentation
Dentoalveolar infection	Swelling of the alveolar ridge with periodontal, periapical, and subperiosteal abscess.
Submental space infection	Firm midline swelling beneath the chin. Caused by infection from the mandibular incisors.
Submandibular space infection	Swelling of the submandibular triangle of the neck around the angle of the mandible. Infection is caused by mandibular molar infections. Trismus is typical.
Sublingual space infection	Swelling of the floor of the mouth with possible elevation of the tongue and dysphagia.
Retropharyngeal space infection	Stiff neck, sore throat, dysphagia, raspy voice. These infections are caused by infections of the molars. The retropharyngeal space infection has a high potential to spread to the mediastinum.
Buccal space infection	Swelling of the cheek. Caused by infection of premolar or molar tooth.
Masticator space infection	Swelling on either side of the mandibular ramus and is caused by infection of the mandibular third molar. Trismus is present.
Canine space infection	Swelling of the anterior cheek with loss of the nasolabial fold and possible extension to the infraorbital region.