THE SPREAD OF ODONTOGENIC INFECTION - PART I

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Introduction
Infections seen in the dental clinic originate mainly from either the pulpal tissue or the supporting periodontal structure. Dental surgeons deal with odontogenic infections in their daily work. We try to arrest caries and periodontal disease, which in fact is actually the infection of the tooth structure and its supporting tissue. Fortunately, most odontogenic infection we see daily are rather localised but occasionally they spread to the surrounding and/or distant tissue. Dental infections can present as abscesses, sinus tracts or severe cellulitis involving the superficial spaces, masticator spaces, floor of the mouth spaces or deep neck spaces. This write up is divided into three parts. In part I, we are going to discuss the localised spread of odontogenic infection namely, periradicular abscess and sinus tract formations. The spread of infection to the maxillary sinus is briefly discussed. Part II will discussed the more severe cellulitis involving the superficial spaces and masticator spaces. Infections into the deep head and neck spaces will be dealt with in part III. Occasionally, odontogenic infection causes osteomyelitis, though this is surprisingly not common.

Osteomyelitis in the jawbones is dealt with in the write-up on jawbones infection (see Infections of the jawbones).

Periapical abscess
The spread of caries in a tooth, if not arrested, will result in infection of the pulpal tissue and eventual pulpal necrosis. This necrosed tissue may collect at the peri-radicular region of the tooth. Inflammatory process will occur as the body responses to this collection. The accumulation of acute inflammatory cells at the apex of a non-vital tooth is termed a periapical abscess. Periapical abscess may arise as the initial periapical pathosis or from an acute exacerbation of a chronic periapical inflammatory lesion (phoenix abscess). It has to be reminded that the infection can happen in any part of the root e.g. at the inter-radicular area in deciduous molars and not confined to the apex, hence the term peri-radicular abscess has been suggested.

[Note: the term “peri-radicular” is now more preferred by the endodontists than “penapex” (Personal communication: Prof. RT Walker). In this write-up the term “penapex” denotes both radicular and apical areas.]

Abscesses usually consists of a sea of polymorphonuclear leukocytes often intermixed with inflammatory exudate, cellular debris, necrotic material, bacterial colonies or histiocytes. Periapical abscess has been classified into acute and chronic types, but Neville et al. suggested that this is a misnomer since both types represent acute inflammatory reactions.

They prefer to designate periapical abscesses as either symptomatic or asymptomatic based on their clinical presentations. Periapical abscesses become symptomatic when the purulent material accumulates within the alveolus. The initial stages produce tenderness of the affected tooth that is often relieved by direct application of pressure. With time, the pain becomes worse and the tooth will become very sensitive to percussion. Extrusion and swelling either around the tooth, at the labial sulcus or occasionally the lingual or palatal area may be noted.

The abscess may not be detected radiographically. We may only see a thickened peri-radicular periodontal ligament, an ill-defined radiolucency, or both depending on the time lapse between the onset of infection and time the radiograph is taken.

Radiolucency may not be appreciable when there is not enough time for significant bone destruction. Phoenix abscess, however, will demonstrate the outline of the original chronic lesion with or without an associated ill-defined bone loss.

Most odontogenic abscesses perforate buccally because the bone is thinner on the buccal surface. Conversely, infections associated with maxillary lateral incisors, the palatal roots of maxillary molars and mandibular second and third molars typically drain through the lingual cortical plate.

With progression, the abscess may extend to the path of least resistance, away from the tooth.