Oral Pathology

**ﻥﺎﻨﺴﻻﺍ ﺏﻁ ﺔﻴﻠﻜ / ﺔﻴﺭﺼﻨﺘﺴﻤﻟﺍ ﺔﻌﻤﺎﺠﻟﺍ**

Lecture 4 Periapical Pathology **ﻲﻨﺎﺜﻟﺍ ﻲﺴﺍﺭﺩﻟﺍ لﺼﻔﻟﺍ / ﺎﻴﻠﻌﻟﺍ ﺕﺎﺴﺍﺭﺩﻟﺍ**

**مصطفى محمد السعدي.م.د.ا**

**ACUTE PERIAPICAL CONDITION**

The factors leading to the development of acute lesions at the apex of a tooth are usually one or more of the following:

1. Young tooth with open tubules.

2. Rampant caries.

3. Closed acute pulpitis.

4. Presence of highly virulent microorganisms.

5. Weakened host defense system.

**Acute periapical periodontitis**

This is characterized by an acute inflammatory exudate in the periodontal ligament within the confined space between the root apex and the alveolar bone.

**Clinical features:**

Pain is elicited when external pressure is applied to the tooth because the pressure is transmitted through the fluid exudate to the sensory nerve endings, even light touch may be sufficient to induce pain.

Unlike pulpitis, this is generally well located by the patient to a particular tooth clue to stimulation of proprioceptive nerve endings in the periodontal ligament. As the fluid is not compressible, the tooth feels elevated in its socket.

Hot or cold stimulation of the tooth does not cause pain, as it would in pulpitis.

**1**

**Radiographic Features:**

The radiographic appearances are often normal as there is generally insufficient time for bone resorption to occur between the time of injury to the periodontal ligament and the onset of symptoms. If radiological changes are present, they consist of slight widening of the periodontal ligament and the lamina dura around the apex may be less well defined than normal.

**Histopathological features:**

This characterized by vascular dilatation, exudates of neutrophils, and oedema, in the periodontal ligament situated in the confined space between the root apex and the alveolar bone.

**Prognosis and Sequelae:**

The inflammation may be transient if it is clue to acute trauma rather than infection and the condition soon resolves.

If the irritant persists the inflammation becomes chronic and may be associated with resorption of the surrounding bone.

Suppuration may occur if there is severe irritation and tissue necrosis associated with bacterial infection and the continued and massive exudation of neutrophil leucocytes leading to abscess formation. Such an abscess is called an acute periapical or alveolar abscess.

**PERIAPICAL ABSCESS**

The accumulation of acute inflammatory cells at the apex of a nonvital tooth is termed a periapical abscess.

Acute inflammatory lesions with abscess formation may arise as the initial periapical pathosis or from an acute exacerbation of a chronic periapical inflammatory lesion.

**2**

**Etiology:**

An acute periapical abscess may develop either directly from acute periapical periodontitis or more usually from a chronic periapical granuloma.

It is generally the result of a mixed bacterial infection, culture of pus yielding a wide range of different species.

**Clinical Features:**

\* Periapical abscesses become symptomatic as the purulent material accumulates within the alveolus.

\* The initial stages produce tenderness of the affected tooth that often is relieved by direct application of pressure.

\* With progression, the pain becomes more intense, often with extreme sensitivity to percussion, extrusion of the tooth from the socket sufficiently to cause occlusal interference and greatly increased pain when it contacts an opposing tooth.

\* In locations where the root apex is in close proximity to the cortex of the overlying alveolar bone, swelling and redness of the area will be present.

\* The offending tooth does not respond to cold or electric pulp testing.

\* Headache, malaise, lymphadenopathy, fever, and chills may be present.

**Radiographical features:**

Abscesses may demonstrate a thickening of the apical periodontal ligament, an ill-defined radiolucency; however, often no appreciable alterations can be detected because insufficient time has occurred for significant bone destruction.

Abscesses demonstrate the outline of the original chronic lesion; if the condition is an exacerbation of a chronic periapical periodontitis or periapical granuloma, with or without an associated ill-defined bone loss.

**3**

**Histopathologic Features:**

Abscesses consist of a central core of tissue that has undergone disintegration and liquefaction and is composed of purulent exudates with a sea of polymorphonuclear leukocytes often intermixed with inflammatory exudate, cellular debris, necrotic material and bacterial colonies.

**Routes of spread**

With progression, the abscess spreads along the path of least resistance.

The increase in hydrostatic pressure within the abscess associated with progressive suppuration causes the pus to track in one of a number of directions.

**Possible outcomes are**

1. The pus may discharge directly into the oral cavity through a sinus following local penetration of the overlying periosteum and mucosa. This may occur with little or no pain and only a small swelling may develop on the oral mucosa before the pus breaks through. The pus may accumulate beneath the mucosa and the patient may complain of a 'gumboil' before a sinus develops.

A nodule of granulation tissue often forms in response to the irritation by pus and marks the opening of the sinus, then drain through an intraoral sinus, that is a mass of subacutely inflamed granulation tissue often is found known as a parulis (gum boil).

2. The purulence may extend through the medullary spaces away from the apical area, resulting in osteomyelitis.

3. Abscesses in the molar region of either jaw may penetrate the cortex and the acute inflammatory oedema and suppuration spread through the facial planes of the overlaying soft tissues of the face or neck. This acute and edematous spread of an acute inflammatory process is termed cellulitis.

4. Dental abscesses may channelize through the overlying skin and drain via a

cutaneous sinus.

**4**

**Cellulitis**

Cellulitis is a rapidly spreading inflammation of the soft tissues particularly associated with streptococcal infections. Clinically, there is diffuse, tense, painful swelling of the involved soft tissues usually associated with malaise and an elevated temperature. Much of the swelling is due to inflammatory edema; suppuration and abscess formation occur later if treatment is neglected or delayed.

Numerous patterns of cellulitis can be seen from the spread of dental infections, the two especially dangerous forms are:

(1) Ludwig angina and (2) cavernous sinus thrombosis

Cellulitis associated with maxillary teeth initially involves the upper half of the face. Extension towards the eye is a potentially serious complication lead to the risk of cavernous sinus thrombosis. Cavernous sinus thrombosis appears as an edematous periorbital enlargement with involvement of the eyelids and conjunctiva.

Abscesses developing at the root apices of maxillary molars and premolars are very close to the floor of the maxillary sinus. The communication between the floor of the maxillary sinus and the oral cavity may result. This abnormal open communication is called oroantral fistula.

Cellulitis associated with mandibular teeth initially involves the lower half of the face; extension into the submandibular and cervical tissues may cause respiratory embarrassment.

Ludwig's angina is severe cellulitis involving the submandibular, sublingual, and submental spaces. The diffuse cellulitis produces a boardlike swelling of the floor of the mouth, the tongue being elevated and displaced posteriorly. As a result there is difficulty in eating, swallowing, and breathing and with risk of

death by suffocation.

**5**

**Treatment and Prognosis:**

Treatment of the patient with a periapical abscess consists of drainage and elimination of the focus of infection.

Those abscesses associated with a patent sinus tract may be asymptomatic but should be treated.

Incisional drainage of the swelling should be considered.

Treatment with NSAIDs usually is appropriate preoperatively, immediately postoperatively, and for subsequent pain control.

Once the infection has been resolved by extraction or appropriate endodontic therapy, the affected bone typically heals.

**6**