Periapical Lesions of Endodontic Origin

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Formation of Lesions of Endodontic Origin

- Microorganisms
- Chronic Inflammatory cells
- Shifts to PMN's
- Necrosis Spreads
- Apical Portals of Exit

Necrosis spreads to apices- via apical portals of exit.

Periapical Defenses

- Superior to pulpal defenses
  - Rich blood supply and lymphatic's
- Limitless source of undifferentiated cells
- Extensive defense but locally destructive

Classification of Periapical Lesions

- Normal PA tissue
- Symptomatic Apical Periodontitis
- Asymptomatic Apical Periodontitis
  - Condensing Osteitis
- Acute Apical Abscess
- Chronic Apical Abscess

Look for widening of the PDL,

Symptomatic Apical Periodontitis

- First extension of pulpal inflammation into periradicular tissues
- Causes are: bacterial, chemical, hyper-occluding restoration, over-instrumented canal, or overextended obturation
  - Be very thorough, b/c if a recent restoration is too high it can cause S.A.P.
- **The pulp may be vital or necrotic**

Signs and Symptoms of Symptomatic Apical Periodontitis

- Moderate to severe spontaneous pain
- Pain to mastication and percussion
- Most cases have an intact PDL but an area can be present (space where PDL is abscent)

Histology of Symptomatic Apical Periodontitis

- PMN leucocytes and macrophages localized at apex
- small area of liquefaction necrosis (abscess)
- Bone and root resorption on histological level

Asymptomatic Apical Periodontitis

- Results from a necrotic pulp
- Usually a sequel to Symptomatic Apical Periodontitis
- Granulomas, cysts, cholesteatoma and condensing osteitis
  - **Cholesteatoma=** have elements in Granuloma but a lot more cholesterol, basically a granuloma that is undergoing fatty degeneration

Treatment of Symptomatic Apical Periodontitis

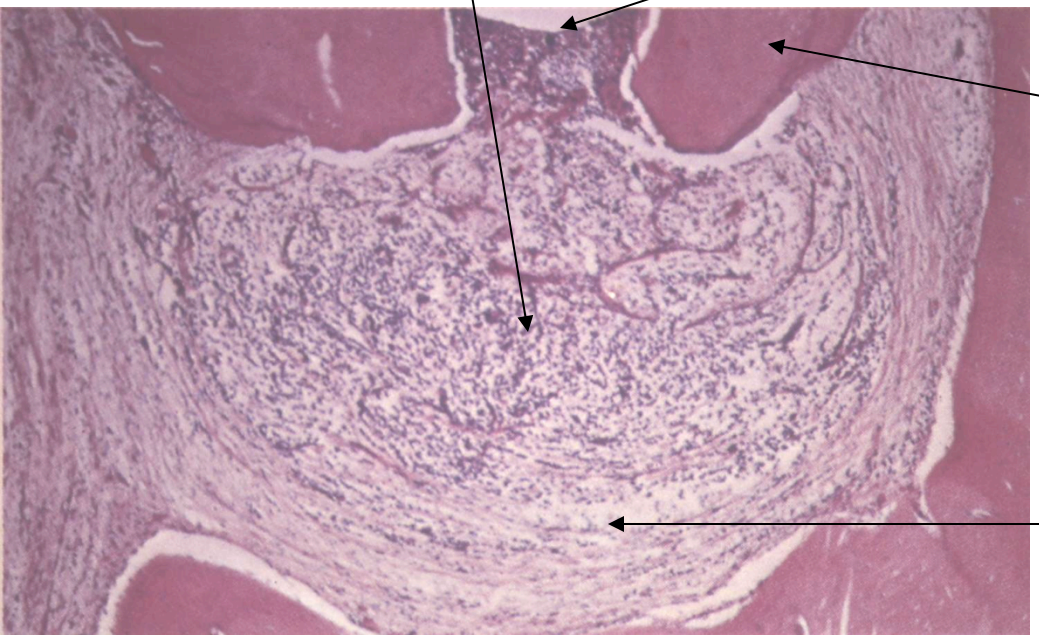
- Adjust the occlusion
- Remove pathologic pulp
- Drain periapical exudate
- Complete endodontic therapy

Histology of Asymptomatic Apical Periodontitis

- The Granuloma: vascular fibrous CT (granulomatous tissue) with mast cells, macrophages, lymphocytes, plasma cells and a small number of PMN's
- The Cyst: has a fluid filled central cavity lined by epithelium surrounded by CT containing all the elements of a granuloma
  - Stratified squamous epithelium from Rests of Malasez

Chronic inflammation and granulomatous tissue

Root canal

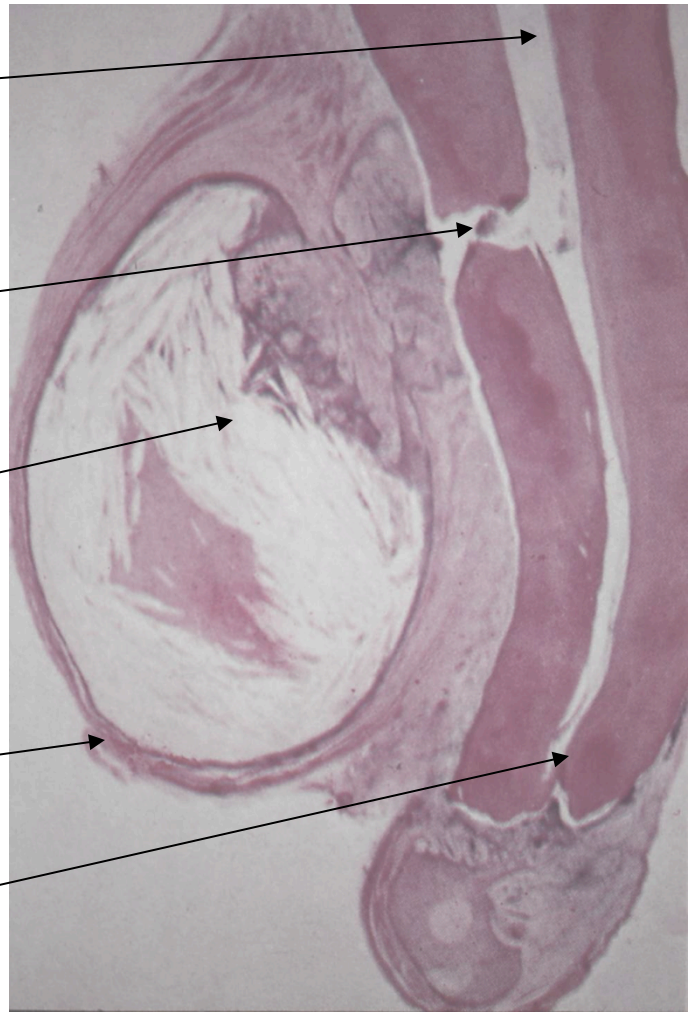


Cementum

Periapical granuloma

It is characterized by a central fluid-filled epithelium-lined cavity (histological section).

RADICULAR CYST



Treatment of Asymptomatic Apical Periodontitis

- Removal of the irritants from necrotic root canal system
- Complete obturation of the root canal system
- There is no evidence that cysts resist resolution following endodontic therapy (non-surgical)

Condensing Osteitis

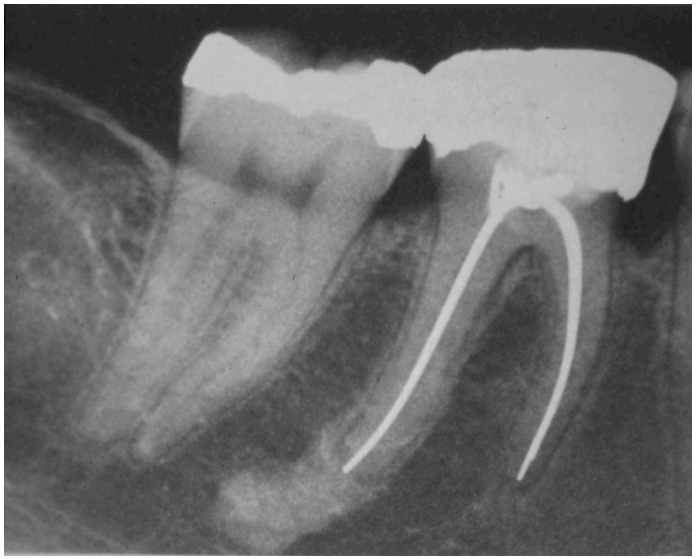
- Variant of Asymptomatic Apical Periodontitis
- Increased trabecular bone in response to persistent irritant
- Usually found around the apices of mandibular posterior teeth
- Response to inflamed or necrotic teeth

CONDENSING OSTEITIS

DIAGNOSIS

-Clinical ➡ vital / non-vital

-Radiographic



Condensing osteitis has been found in 4.5% patients.

T. P. Williams and S. L. Brooks. A longitudinal study of idiopathic osteosclerosis and condensing osteitis. Dentomaxillofacial Radiology, Vol 27, Issue 5 275-278, Copyright © 1998 by British Institute of Radiology

Periapical Abscess

- Acute Apical Abscess
- Chronic Apical Abscess
- Phoenix Abscess- a secondary abscess in response to chronic infection (acute exacerbation)
- **So granulomas are an organized collection of macrophages, while an abscess is like a pimple, its full of dead neutrophil.**

Acute Apical Abscess

- Signs and symptoms- rapid onset, spontaneous pain, temperature, malaise, leucocytosis (high WBC). Necrotic pulp, percussion and palpation positive.
- Histological features- liquefaction necrosis, disintegrating PMN's, cellular debris and a purulent exudate. Surrounding the abscess is granulation tissue.
- Treatment- release exudates; endodontic therapy

ACUTE APICAL ABSCESS

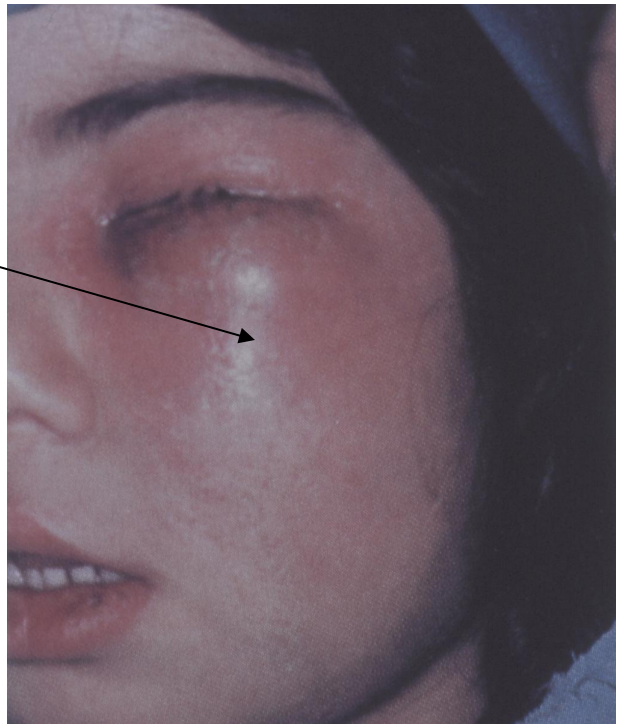
CLINICAL FEATURES

-**Swelling**

-**Tooth feels elevated out of the socket**

-**Elevated temperature**

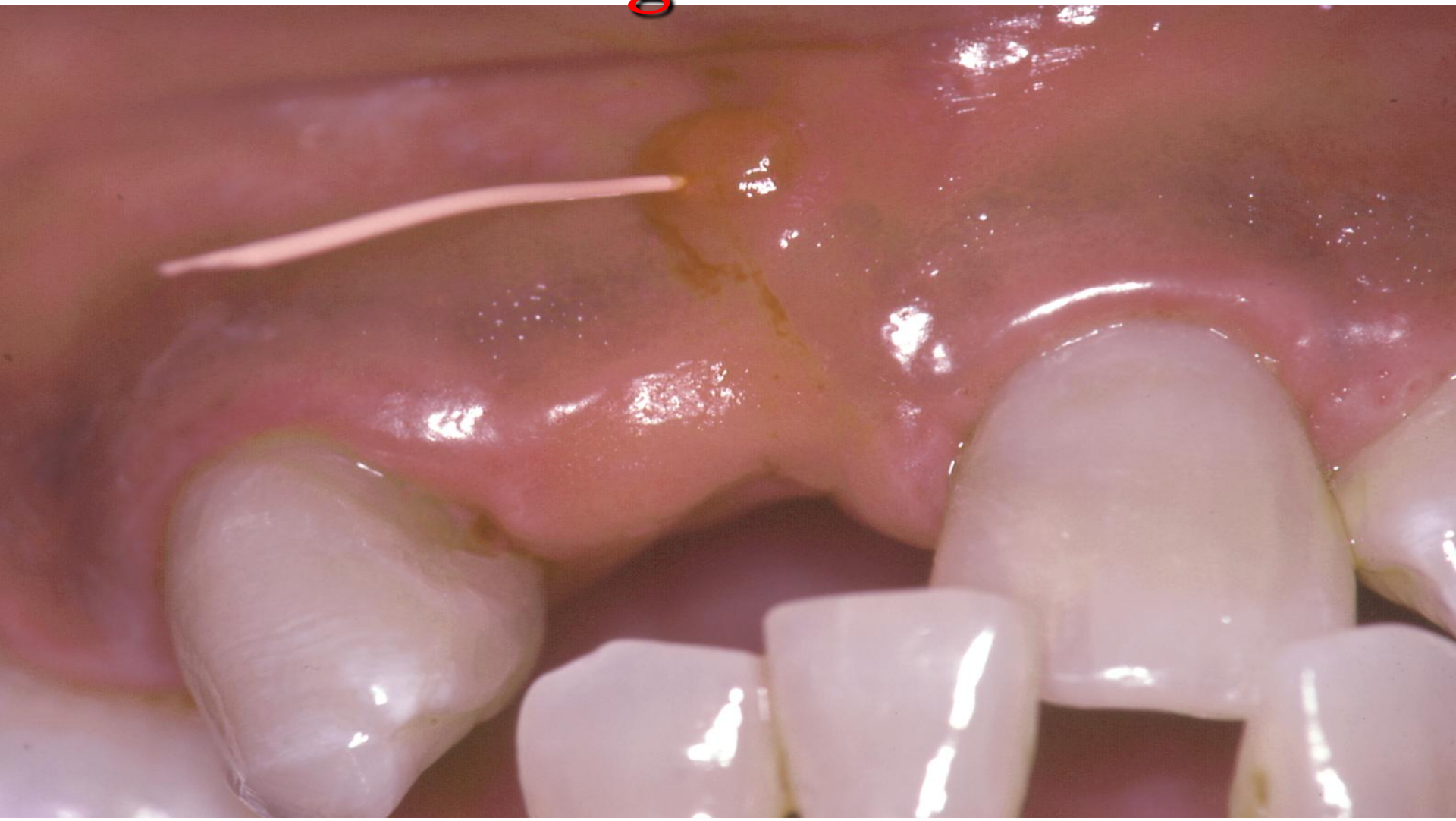
-**Malaise**



Chronic Apical Abscess

- Signs and symptoms- long standing lesion, has drainage to mucosal surface via sinus tract
- Histology is similar to acute abscess
- Treatment- no need to establish drainage, complete cleaning and obturation of the root canal system

Tracing the fistula



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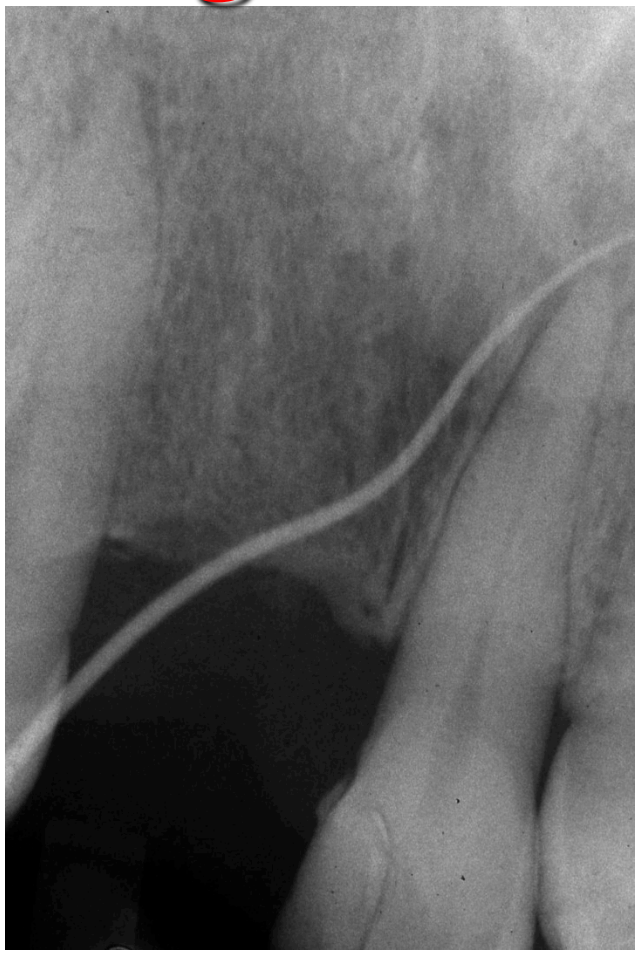

Healing of Periapical Lesions

- **Regeneration**- altered periapical tissues completely replaced by tissue forming the original architecture
- **Repair**- altered tissue not completely restored to original structures (example, scar)
- On a histological level most PA lesions heal by repair

Osteomyelitis

- Severe osseous infection of bacterial origin
- Diagnosis- difficult early because intact cortical plate (CBCT-cone beam=$100,000), malaise, febrile, joint pain.
- Treatment- severe problem, IV antibiotics, extensive surgical excision, massive bone removal and the loss of several teeth.

Cellulitis

- Infection will not localize
- Extensive swelling
- Dissects fascial planes
- Treatment; antibiotics, I and D, Endodontic therapy

Periapical Radiolucencies of Non-Endodontic Origin

- Benign Lesions
- Malignant Lesions
- Normal Anatomic Structures
- Avoid grievous mistakes: Vitality tests, radiographic exam, clinical signs and symptoms, patient history