

Endodontic and Periodontal Interrelationship

Dr János Vág Phd

Department of Conservative Dentistry

Semmelweis University

Based on

Mahmoud Torabinejad, Richard E. Walton, ENDODONTICS: PRINCIPLES AND PRACTICE 4th
edition, Chapter 6

And

Cohen's Pathways of the Pulp 10th edition, Chapter 18

Practical relevance

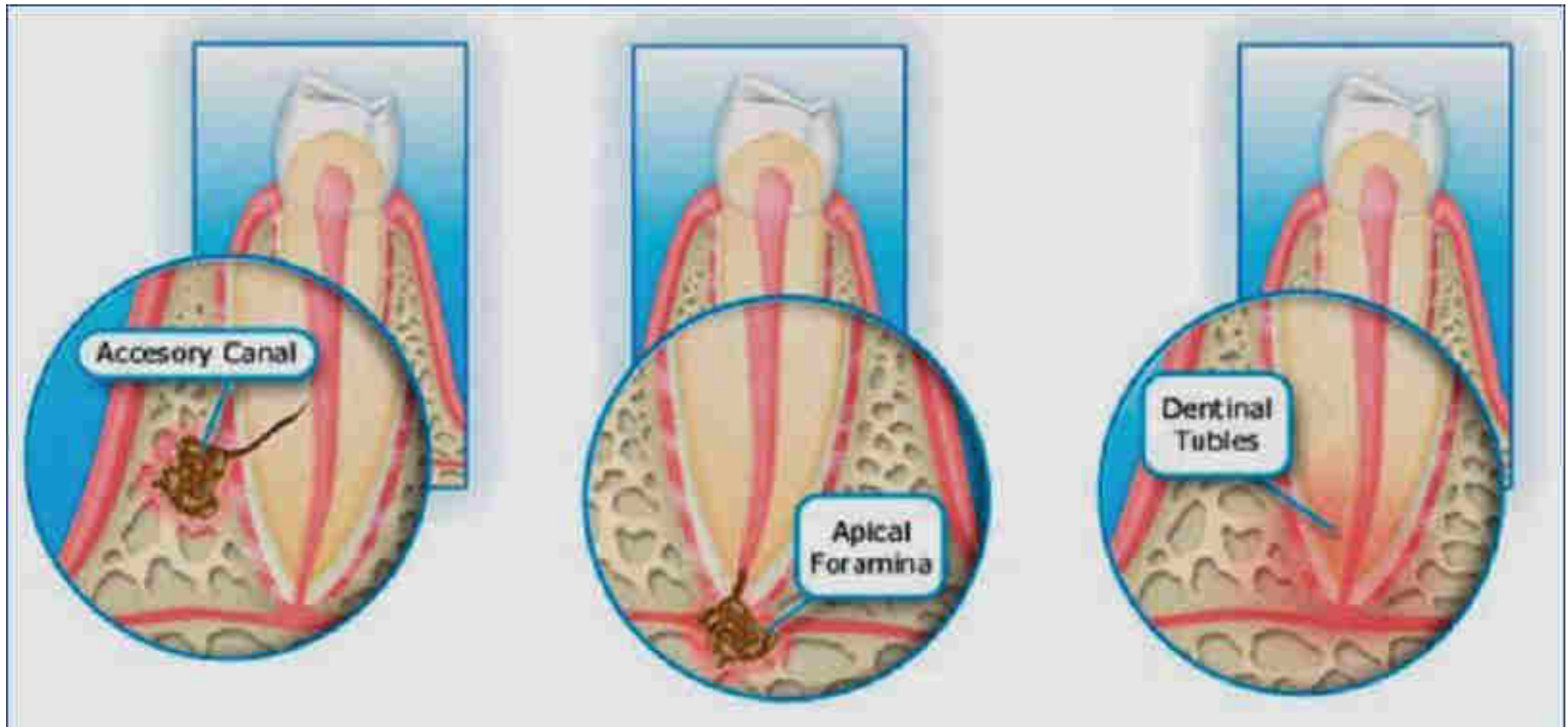
- Diagnosis:
 - Pulpitis/necrosis in sound tooth due to periodontal reason
 - Differential diagnosis:
 - apical abscess vs periodontal abscess
 - apical abscess/periodontal abscess vs vertical root fracture
- Prognosis:
 - Endodontal (well anticipated) and **periodontal** (less anticipated)
- Treatment:
 - Endo + perio

(Differential) Diagnosis of endodontic-periodontal lesions

- Subjective Signs and Symptoms
- Clinical findings
 - Inspection, Palpation, Percussion
 - Sensibility testing
 - Pocket probing
- Radiographic findings

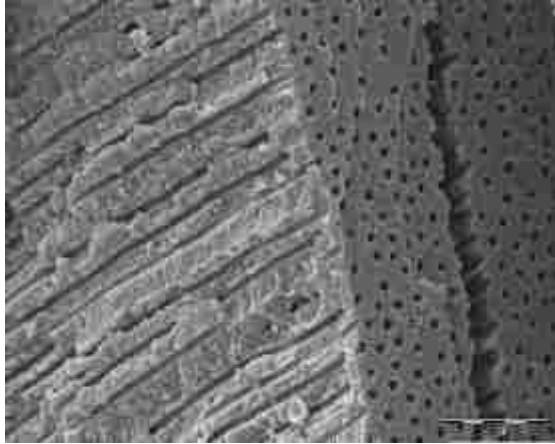
Anatomical background

Communication between the dental pulp and the periodontium

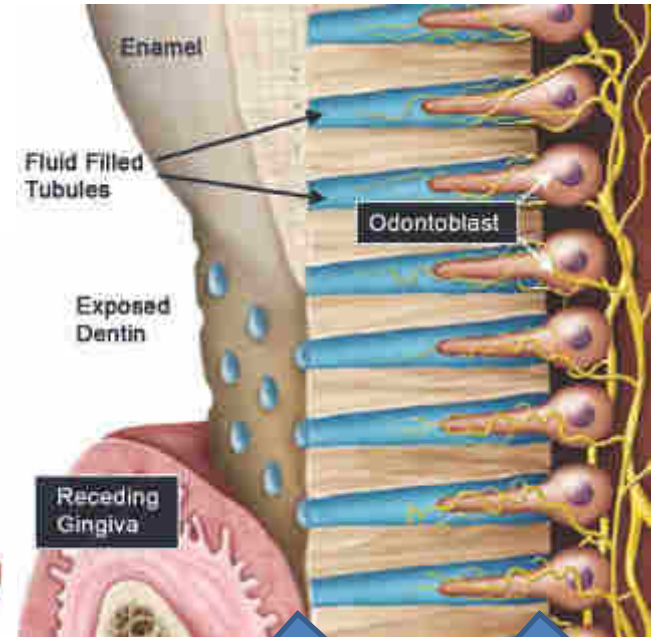
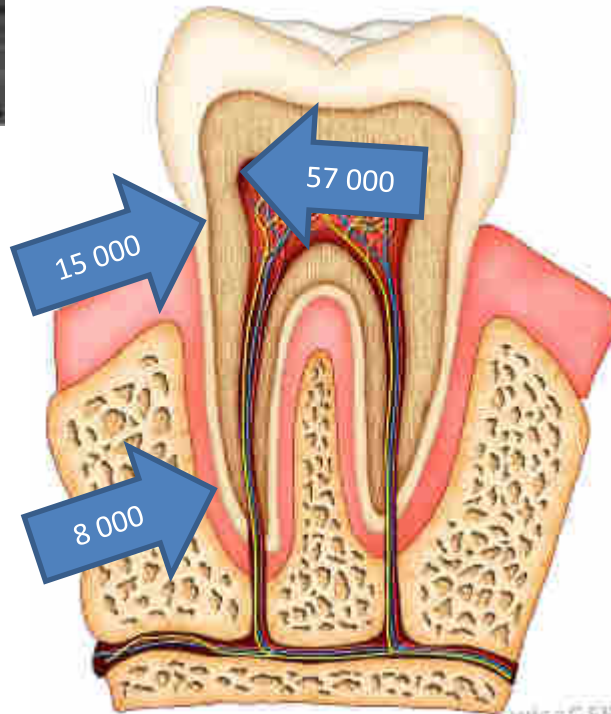


Communication I.

Dentinal tubules



tubules / mm²

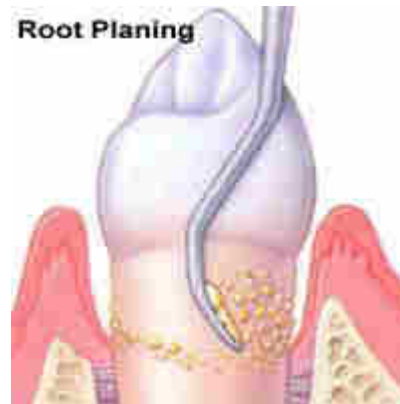
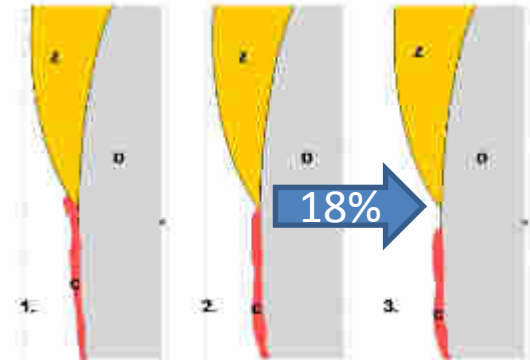
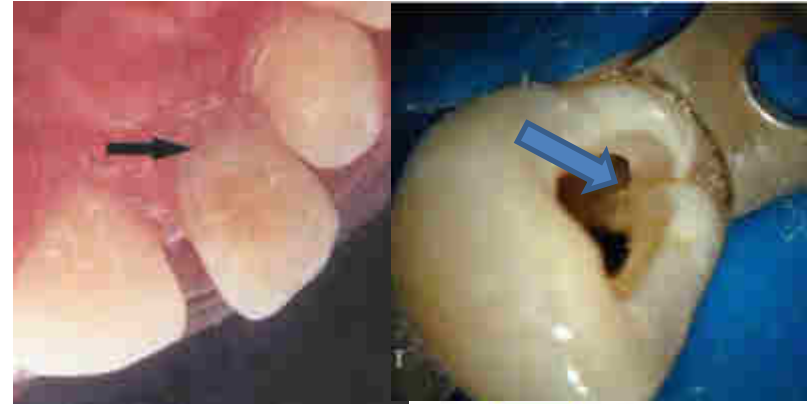


1
um

3
um

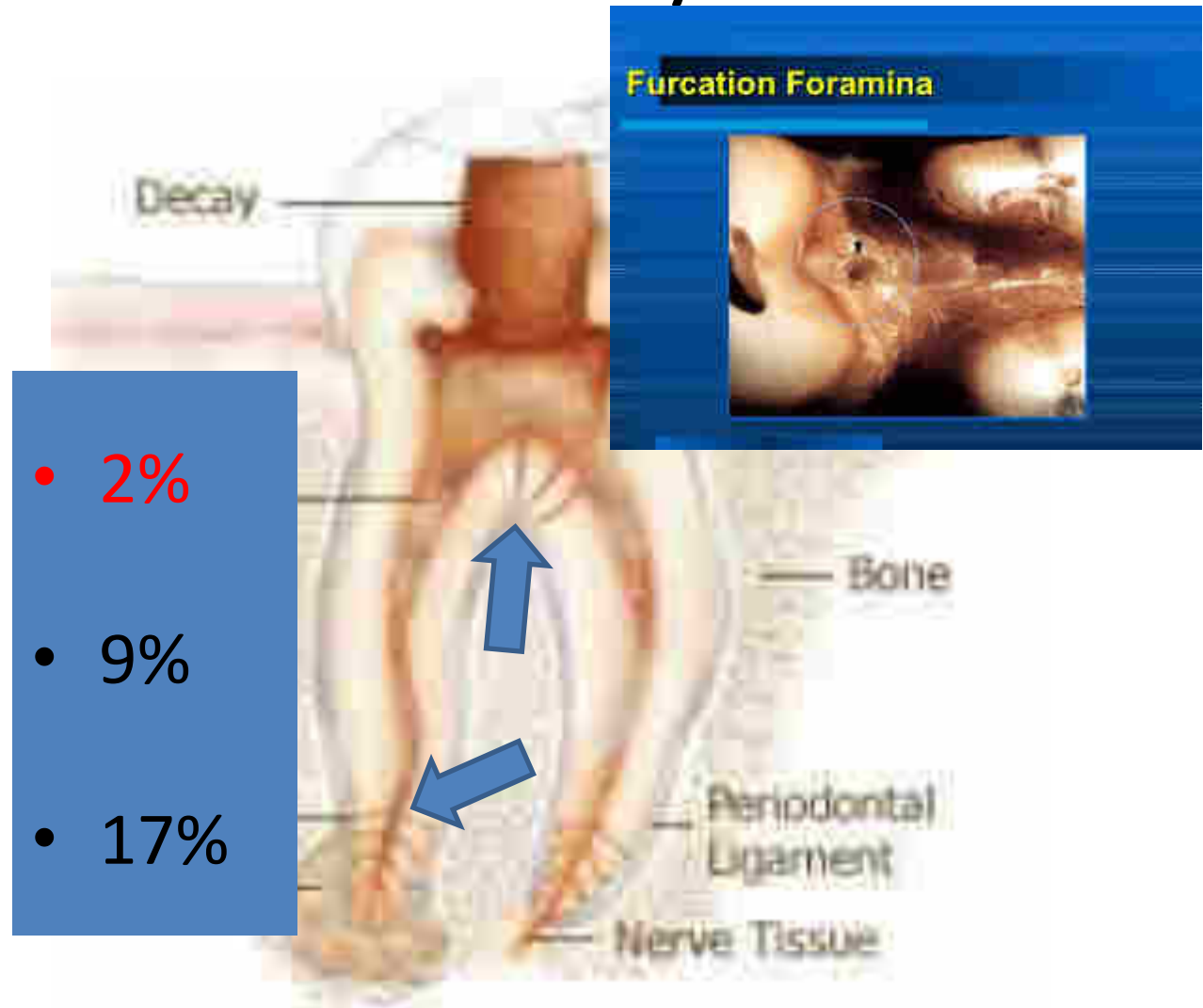
Reasons of the Dentin exposure

- Developmental grooves
- Congenital absence of cementum exposing tubules
- Loss of gingival recession
- Following root planing



Communication II.

Lateral and Accessory Canals



- 2%
- 9%
- 17%

Identification of the accessory/lateral canals

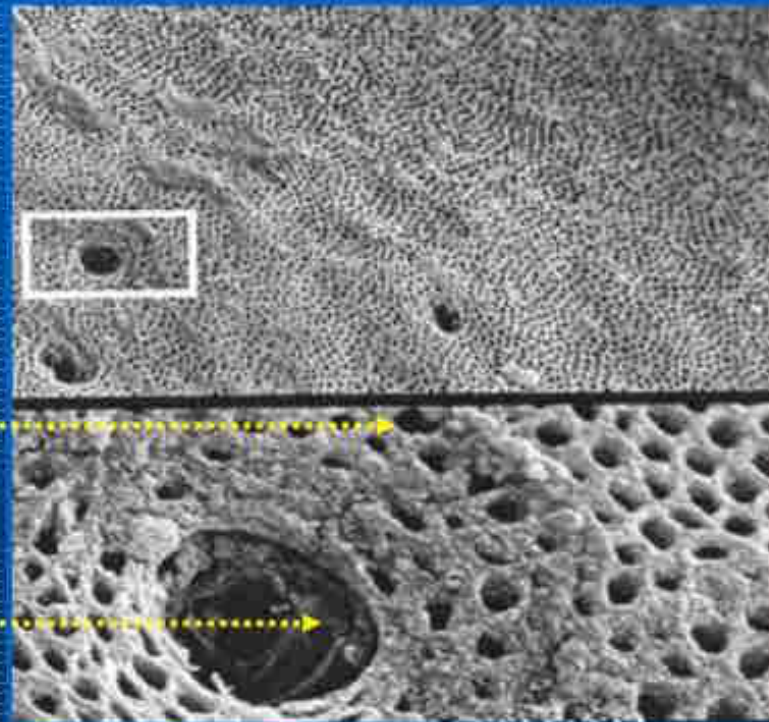
- X-ray
 - Discrete lateral lesion
 - Notch on the lateral surface
 - Filling material extrusion



Dentinal Tubules Vs. Accessory Canals

Dentinal
Tubules

Accessory
Canal



Communication III.

Apical foramen



EFFECT OF ENDODONTIC DISEASE ON THE PERIODONTIUM

- Spreading of the **infection**

Primary Endo

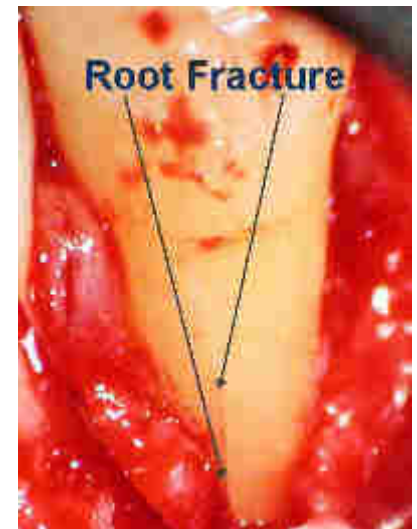
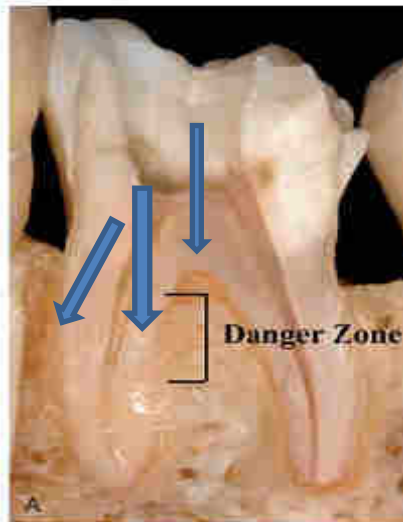


- normal endodontic therapy resulting short term inflammation
- Procedural errors

- ❖ Perforation: floor, strip, root

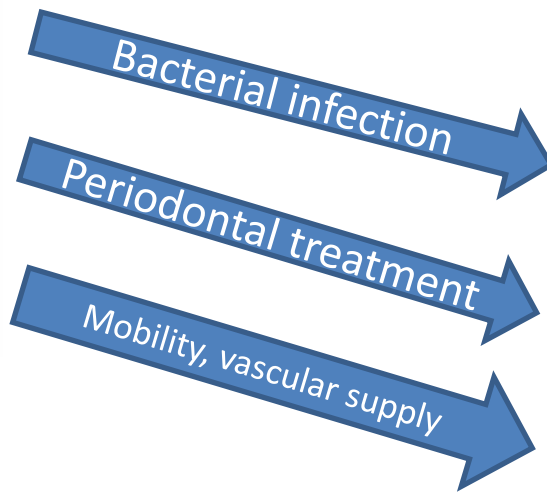
- ❖ Inadvertent irrigation

- ❖ obturation

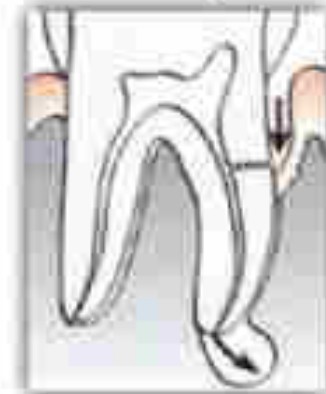


EFFECT OF PERIODONTAL DISEASE ON THE PULP

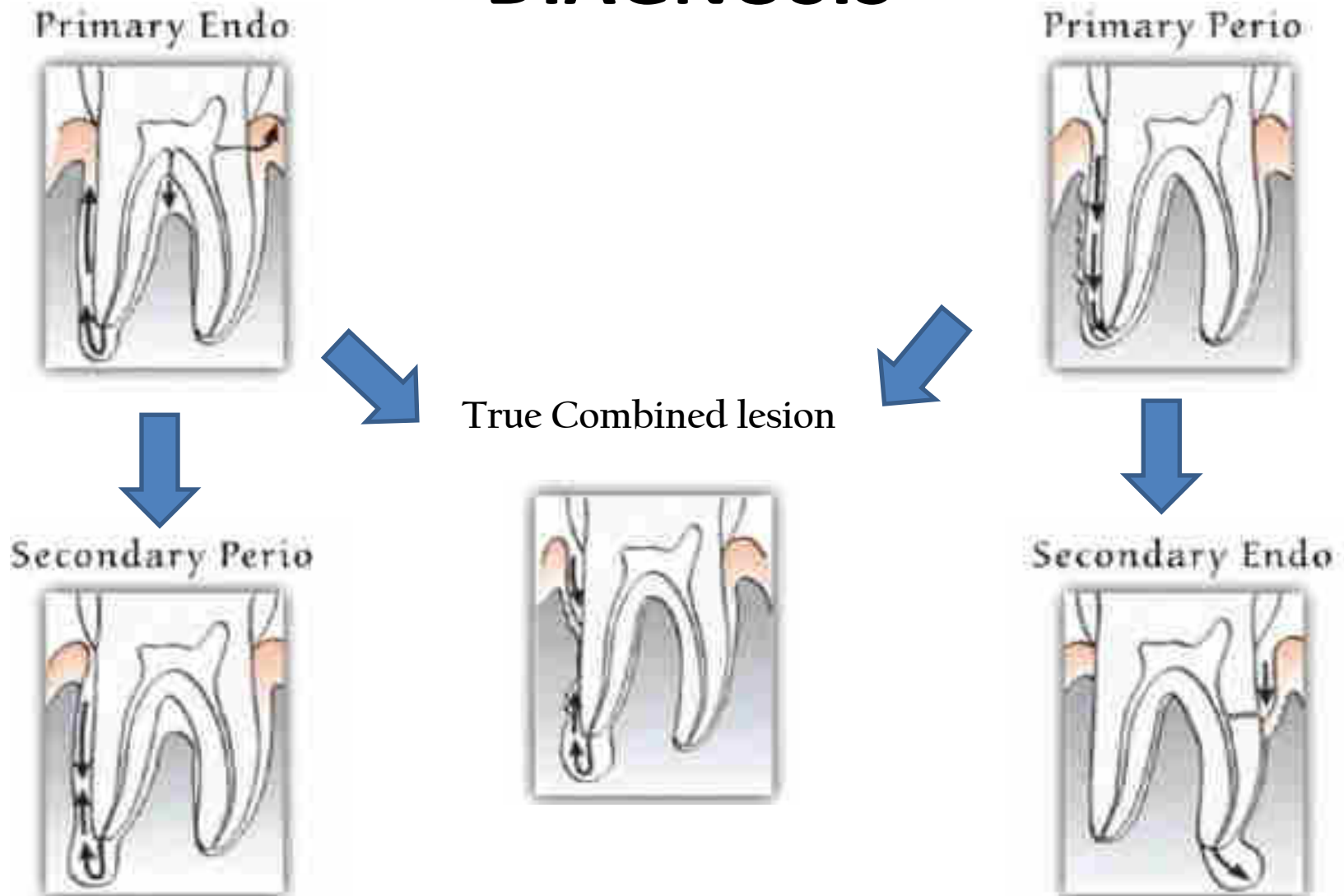
Primary Perio



Secondary Endo



CLASSIFICATION AND DIFFERENTIAL DIAGNOSIS





Primary Endodontic Disease

Etiology:

caries, restorative manipulations, traumatic injury

Clinical Findings

refer to (pulpal)/ periapical pathosis

Pulp Tests

completely **absent** (necrosis, except multirouted teeth)

Probing

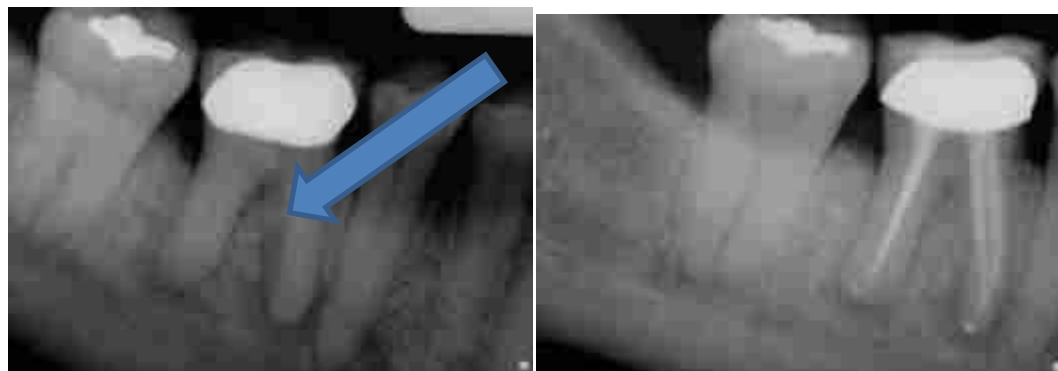
normal sulcus or narrow drainage to the sulcus

Radiographic Findings

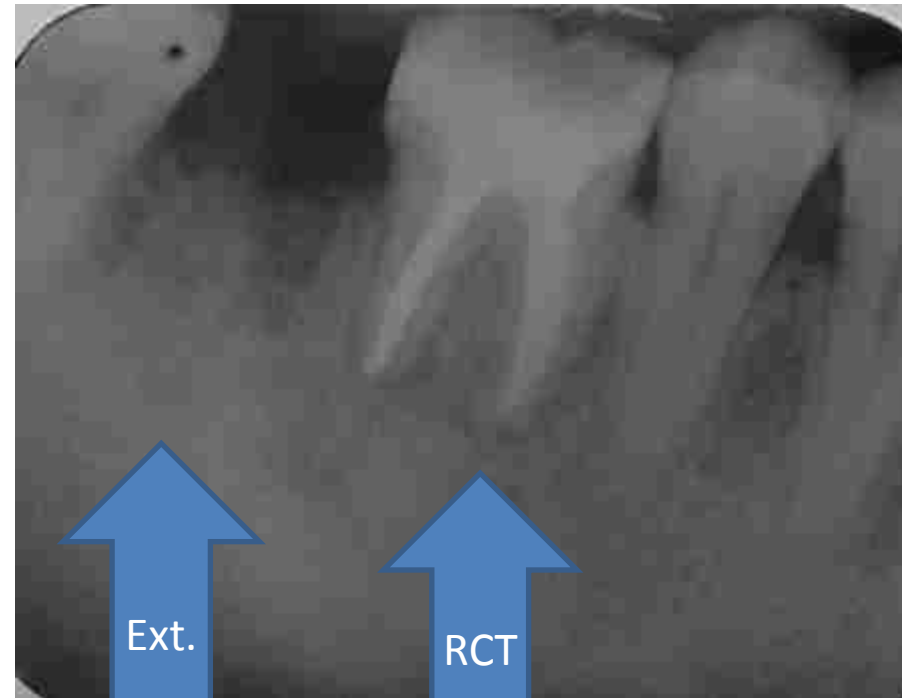
Radiolucency: **apical, lateral, furcation**

Prognosis/treatment

good after **rct**



Treatment of the primary endodontic disease



Ext.

RCT

Due to the recurrent pain
and suppuration

Primary Endodontic Disease with Secondary Periodontal Involvement

Primary Endo



If it is not treated

Secondary Perio



Etiology

If the primary endodontic disease is **not treated** properly

Clinical Findings

Plaque and calculus at the gingival margin due to the drainage

Adjacent teeth are not necessarily involved.

Pulp Tests

Pulp tests will usually reveal **absence** of response (necrosis)

Probing

A **solitary** but wider pocket extending toward the apex

!!Differential Diagnosis: vertical fracture

Radiographic Findings

Radiolucency: apical, lateral, furcation

Widening of the PDL space **extending from apical to cervical**

Angular defects can be seen

Prognosis/treatment

rct may enough but **reevaluation** of periodontal status in 2 to 3 months, if necessary periodontal therapy can occur

Primary Endodontic Disease with Secondary Periodontal Involvement



Primary Endodontic Disease with Secondary Periodontal Involvement





Primary Periodontal Disease

Progression of the periodontal disease

Probing
wide pockets that do not necessarily extend toward the apex.

Clinical Findings
Attachment loss, gingival bleeding, tooth mobility, calculus, plaque



Radiographic Findings:

Gradually lost marginal bone: **horizontal or vertical (angular) bone defect, furcation lesion**

Pulp Tests

normal

Prognosis/treatments

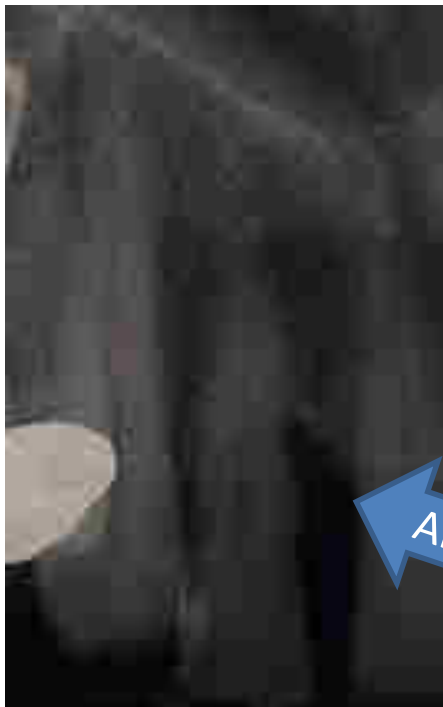
The prognosis depends on the stage of periodontal disease and the efficacy of periodontal treatment.

Periodontal therapy, Extraction, hemisection

Radiographic view of periodontal disease



Primary perio versus primary endo



Primary Periodontal Disease with Secondary Endodontic Involvement

Primary Perio



Vascular supply



Secondary Endo



Clinical Findings

- History of **extensive periodontal disease**, generalized periodontitis is common but not always
- pain originating from an inflamed pulp are common at the early stages of the disease. As the disease progresses, the pulp is expected to lose its vitality.

Pulp Tests

- Abnormal/absence

Probing

- wide pocket sometimes extending apically

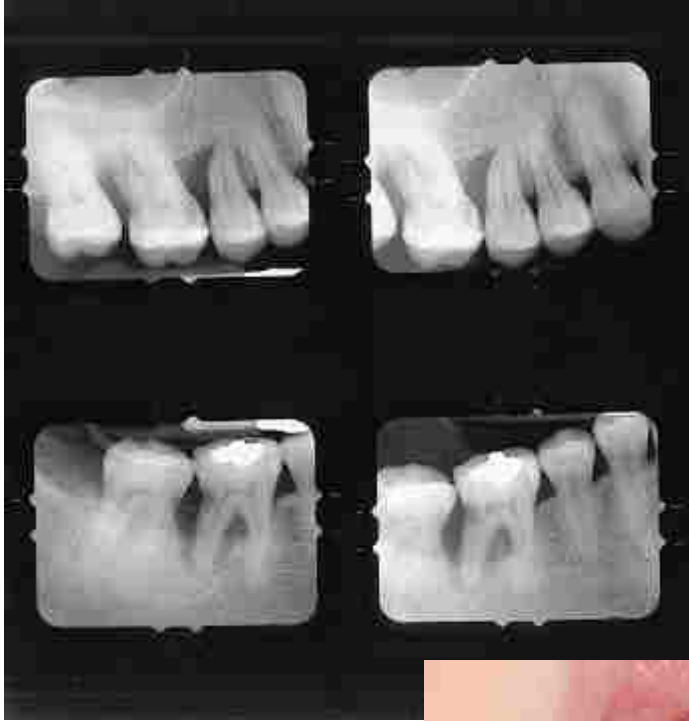
Radiographic Findings

- **angular bone loss** extend from the cervical region toward the apex.

Prognosis

- In **single-rooted** teeth, the prognosis is usually poor. - **extraction**
- In **molar teeth**, the prognosis may be better since all the roots may not suffer the same loss of supporting tissues. In such cases, **root resection** can be considered as a treatment alternative.

Primary Periodontal Disease with Secondary Endodontic Involvement

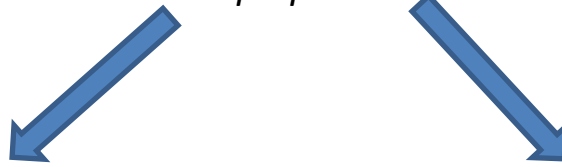


Primary Periodontal Disease with Secondary Endodontic Involvement

deep periodontal pocket at the 17 induced pulp necrosis



Clinical and Radiographic findings
no sign of generalized periodontitis
pulp test:



Non-vital:
Primary endo + sec. perio

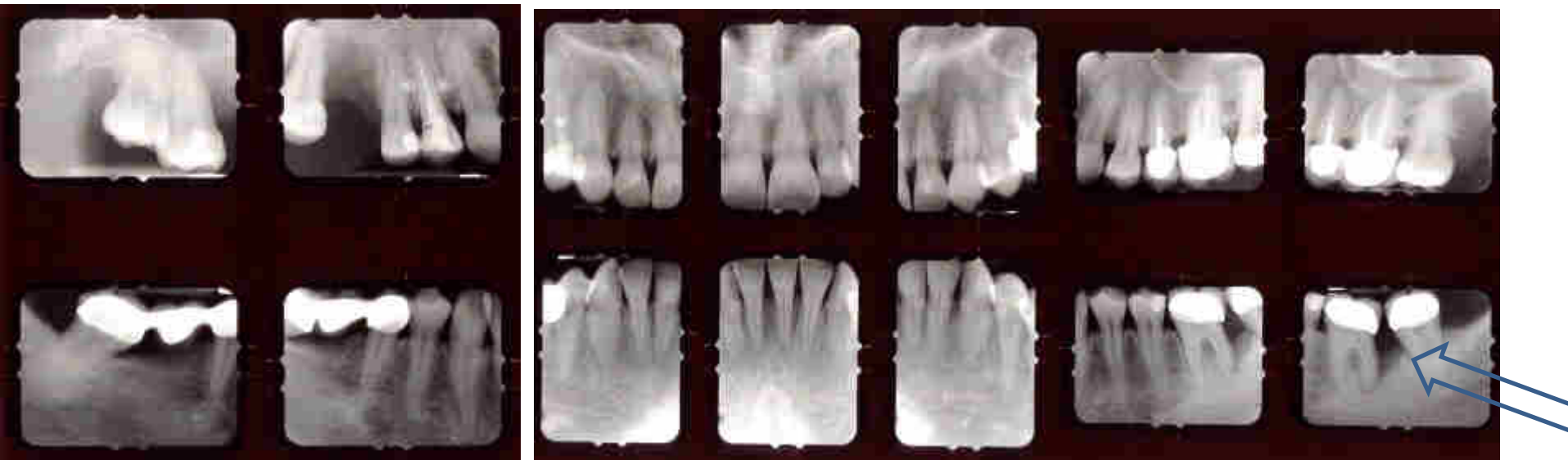


RCT usually
enough

Vital:
Primary perio + sec. endo
*Localized periodontitis at 36 due to the inadequate
contact point*



RCT + surgery



Primary Endodontic Disease with Secondary Periodontal Involvement



hemisection & periosurgery



prosthetic rehab.



True Combined Diseases

True Combined lesion



Clinical Findings

- History of extensive periodontal disease, generalized periodontitis is common but not always
- severe **attachment loss**

Pulp Tests

- absence

Probing

- wide and conical pocket

Radiographic Findings

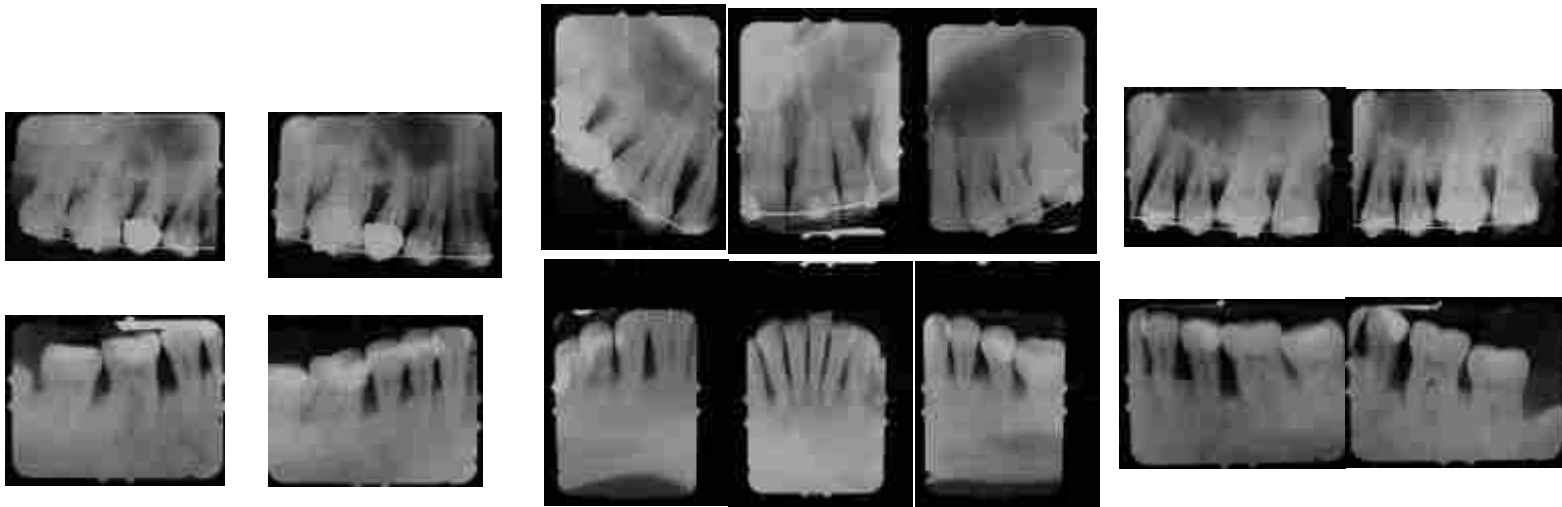
- **Extensive bony radiolucencies** (endo + perio), may or may not communicate.
- may be similar to that of a **vertically fractured** tooth

Prognosis

- periapical healing may be anticipated after successful endodontic treatment.
- The **periodontal healing** depends on the severity of the condition.

True Combined Diseases

Generalized periodontitis and incomplete rct in 15&16



rct & pros.rehab.



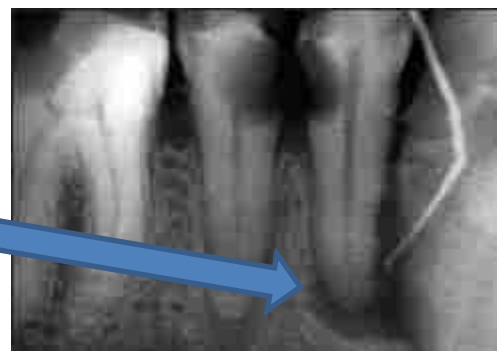
Perio-surgery



e.g. Rapidly developed periodontal abscess. Both molars were free of pulpal disease



e.g. acute exacerbation of chronic apical lesion



Primary Endodontic Disease with Secondary Periodontal Involvement

Procedural errors in rct

Coronal leakage, pulp necrosis, periapical radiolucency, no periodontitis

rct with strip perforation, MTA



2 years later:

furcation lesion

hemisection/bicuspidization

post&core, PFG crown



1 year later:

sinus tract at the distal root

further marginal bone loss in spite of the curettage

Vertical fracture



Differential Diagnosis of Primary endo with secondary perio versus vertical tooth fracture



3 év



Treatment: curettage and monitoring



2 hét



	Primary endodontic origin	Primary periodontal origin	Combined
Pain, inflammation	Acut	chronic	±
Extensive caries or restorations	+	-	±
Sensibility test	-	+	-
Percussion	± especially vertical	± especially lateral	±
Probing defect	narrow	wide	-
Angular or vertical bone loss	-	+	+
Apical bone loss	+	-	±
Nature of treatment	Root canal therapy	Periodontal therapy	Root canal and periodontal therapy

Take home messages

- History
- X-ray
- Follow up
- The secondary disease develop due to the **non-treated** primary one