

# Resorptions

- Dental resorption is the loss of dental hard tissues as a result of clastic (osteoclasts, odontoclasts) activities
- Physiological – primary teeth
- Pathological
  - Internal
  - External

# Internal resorption

- **Internal root resorption (IRR)** is a form of root resorption that originates in dental pulp and affects the root canal wall.
- It is principally an inflammation – form of chronic pulpitis

# External resorption

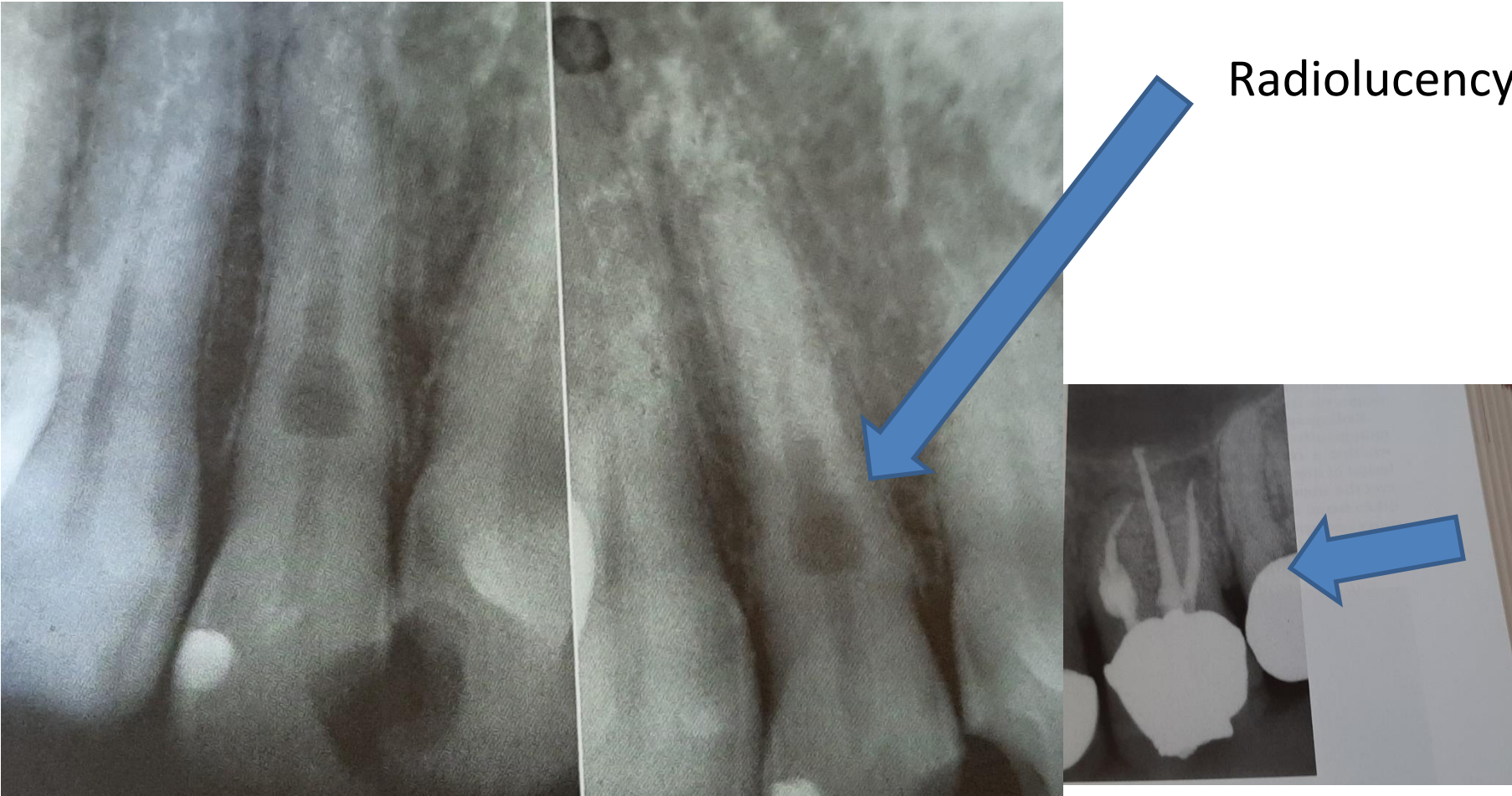
- The **clinical features** of IRR largely depend on the histologic status of the affected pulp and the extent of the hard tissue destruction caused by the resorptive process. Bacterial contamination of vital pulpal tissue may cause an acute inflammatory response, leading to clinical symptoms of pulpitis. With the onset of pulpal necrosis and an established bacterial colonization of the root canal space, clinical signs and symptoms associated with acute or chronic apical periodontitis may develop.
- It can be also asymptomatic

Extensive resorption of the coronal pulp may result in a pink or red discoloration visible through the crown of the affected tooth. This is caused by granulomatous tissue extending into and occupying the resorptive defect.



Pink spot

# Radiogram of internal resorption



# Internal resorption - therapy

Therapy:

Endodontic treatment, good cleaning of the resorptive lacune- NaOCl in high concentration(5,5% - 6%)

Root canal filling – heated guttapercha – injection.

# External resorption

- Affects the external surface of the root

Reasons:

Trauma

Infection

Orthodontic treatment

Periodontal treatment

Surgical treatment

Occlusal trauma

Bleaching (thermocatalytic beaching)

Tumors

Idiopathic

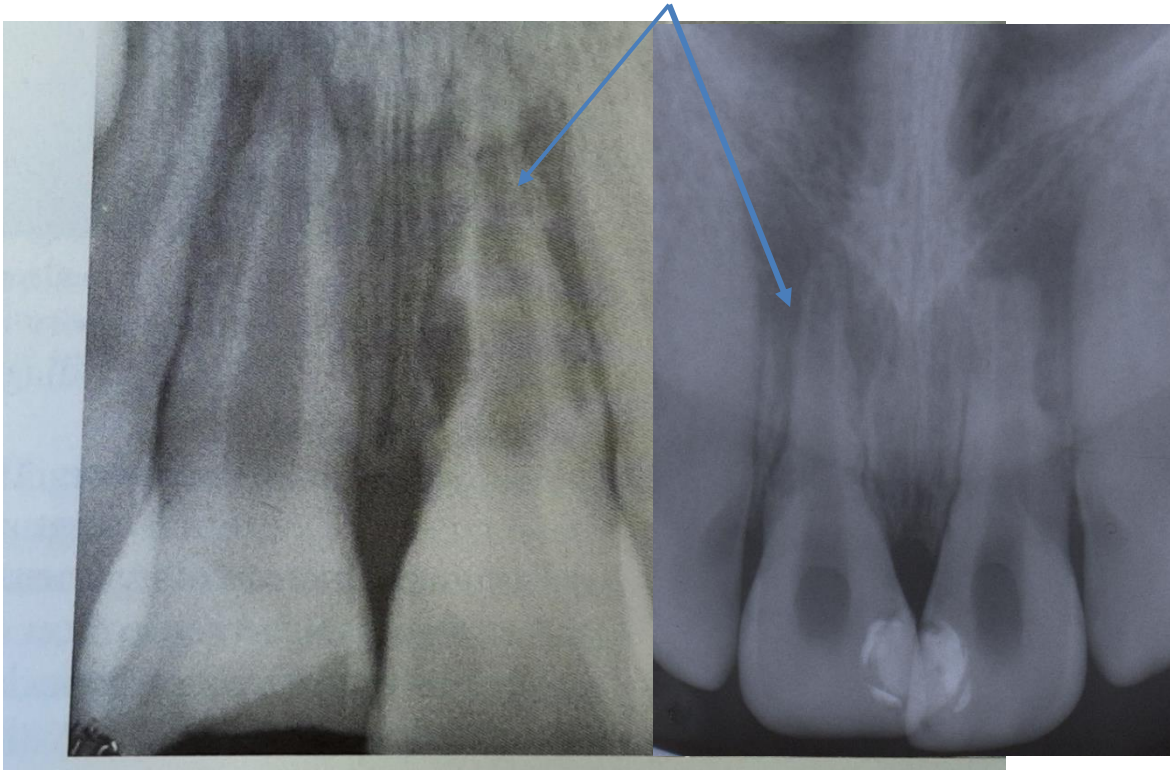
# Classification of external resorptions

- External inflammatory resorption
- External replacement resorption
- Cervical invasive external resorption



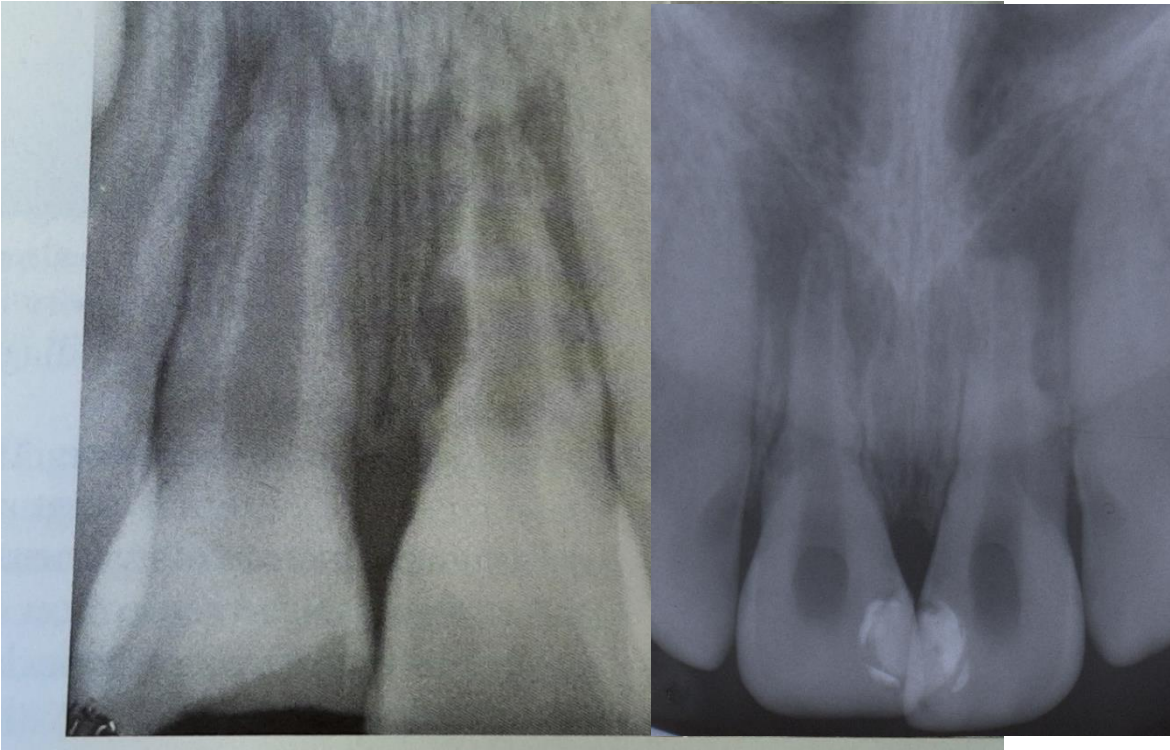
# External inflammatory resorption (EIR)

- Trauma plus infection, the root is narrow, with resorptive lacunae



# Therapy

- Endodontic treatment with long term temporary filling using calcium hydroxide.



# External replacement resorption ERR

- The root is being replaced with the bone – ankylosis is a result of this process.

Aethiology is unclear, probably trauma. The contact of dentin with the bone can induce this process. The periodontal space is not seen.

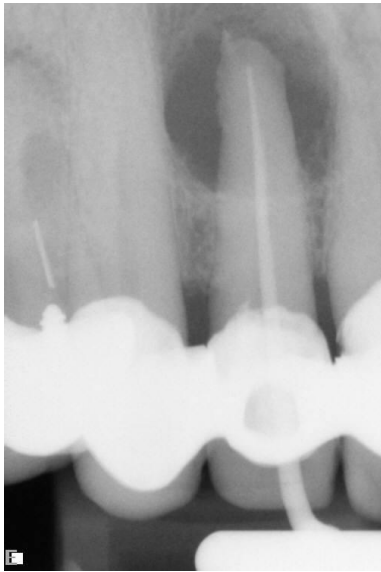


Initial external replacement resorption



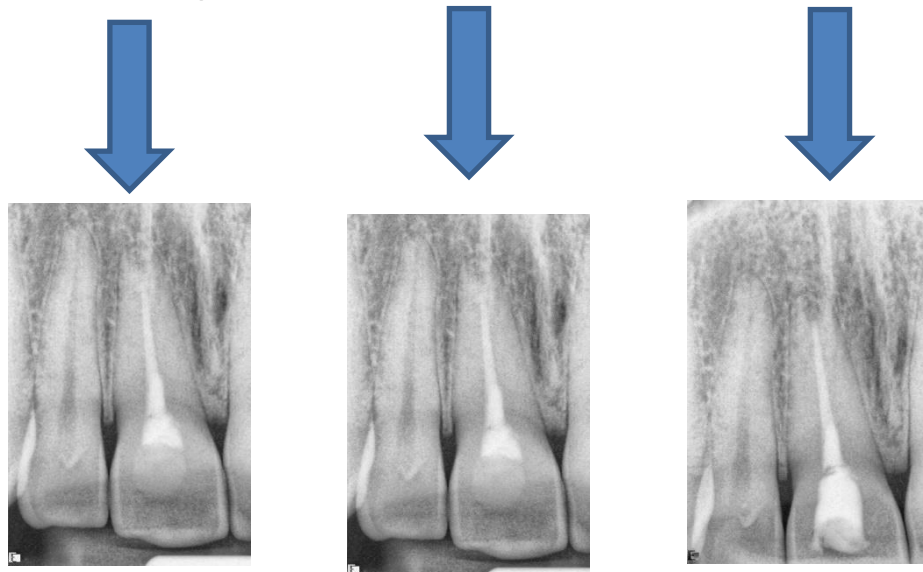
Therapy: No therapy

Teeth with large periapical lesions – signs of resorptions of the surface of the tooth



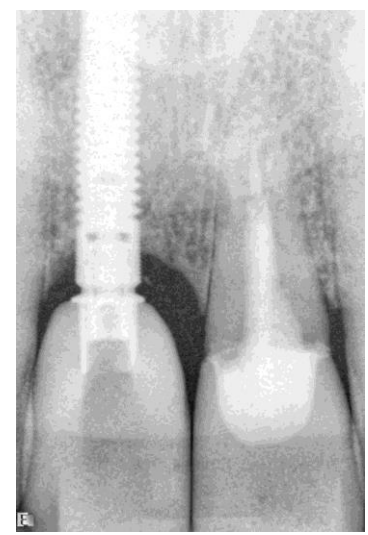
# External replacement resorption

- Trauma - avulsion
- Temporary root canal filling using calcium hydroxide – 6 months
- Radiogram – post op, 6 months, 12 month



# External replacement resorption

- Tooth 11 avulsion, replantation, 5 years – lost of the tooth, fistula after 5 years. The replantation was possible.



# External invasive cervical resorption

- Cervical area, orthodontic treatment in the patient's history
- The lacune is filled with granular tissue, tendency to reparation.

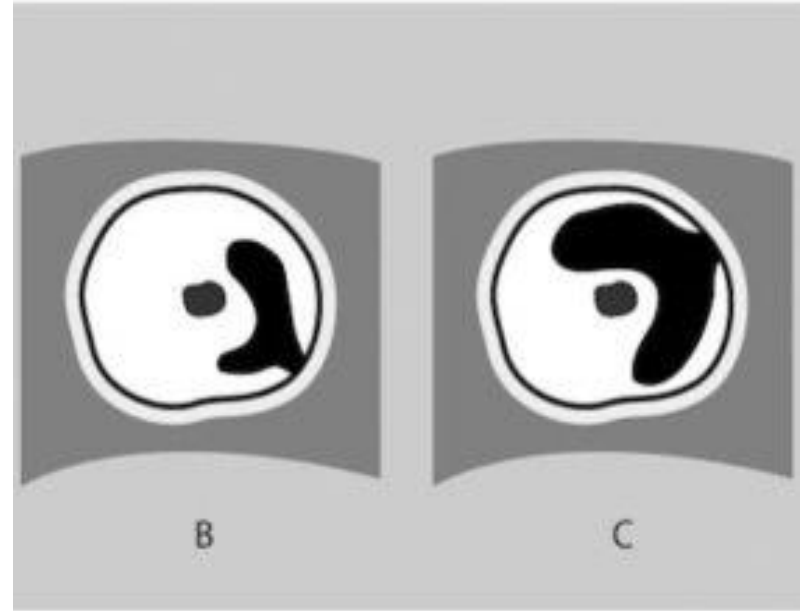
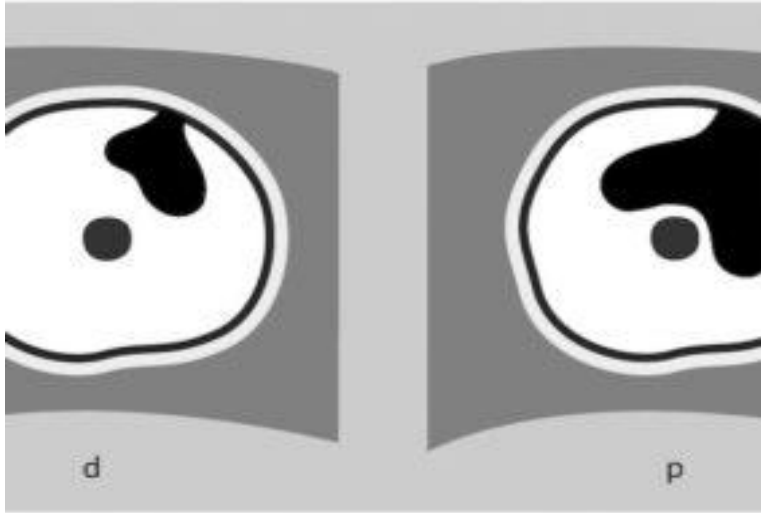
# CLASSIFICATION ACC TO HEITHERSAY

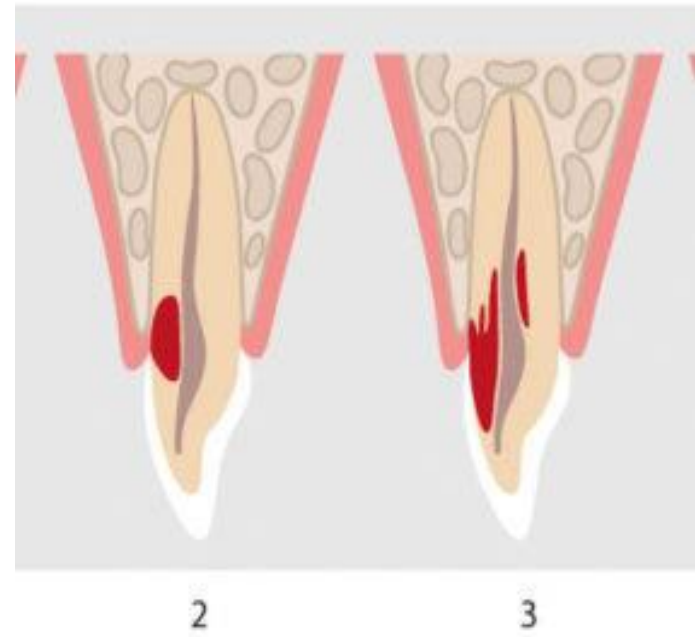
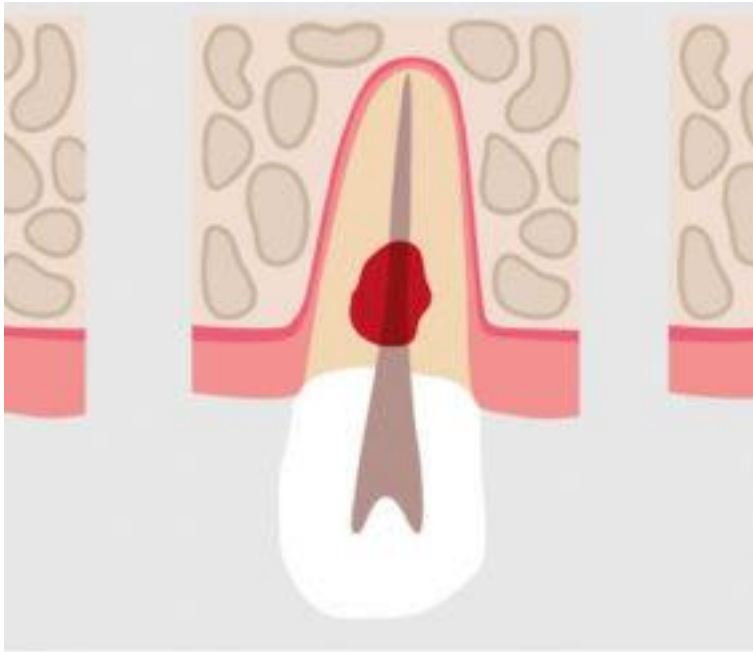
- According to size and propagation:
  - **I. class:** small superficial lesions.
  - **II. class:** good demarcated lesion next to dental pulp without the tendency of apical propagation
  - **III. class:** tendency to growth and propagation in apical direction. It remains in the coronal third of the tooth.
  - **IV. class:** large lesions, propagation along the pulp chambre apically



# Classification acc to Patel

- 3D CBCT:
- **1. Height of the lesion (coronoapical) - relation to the crest**
- **2. Circular propagation**
- **3. Nearness of the cavum pulpae**





Area of beginning can have microscopic size, can be multiple.

# Phases

- **1. Phase of propagation**

ECIR is spreading, the aethiological factors persist.

- **2. Phase of stagnation:** resorptive and reparative processes are in the balance.

- **3. Phase of regression:** the size of the lacune is decreasing

# Clinical diagnosis

- 1. Mostly asymptomatic
- 2. Pink spot
- 3. Bleeding on probing – periodontal pocket can be present
- 3. Sensitivity on thermal stimuli or bite
- 4. Cold sensitivity test: comparable with the other teeth or increase when the lesion is large

# EICR

Ortho treatment in the history – agenesis of maxillary lateral incisor

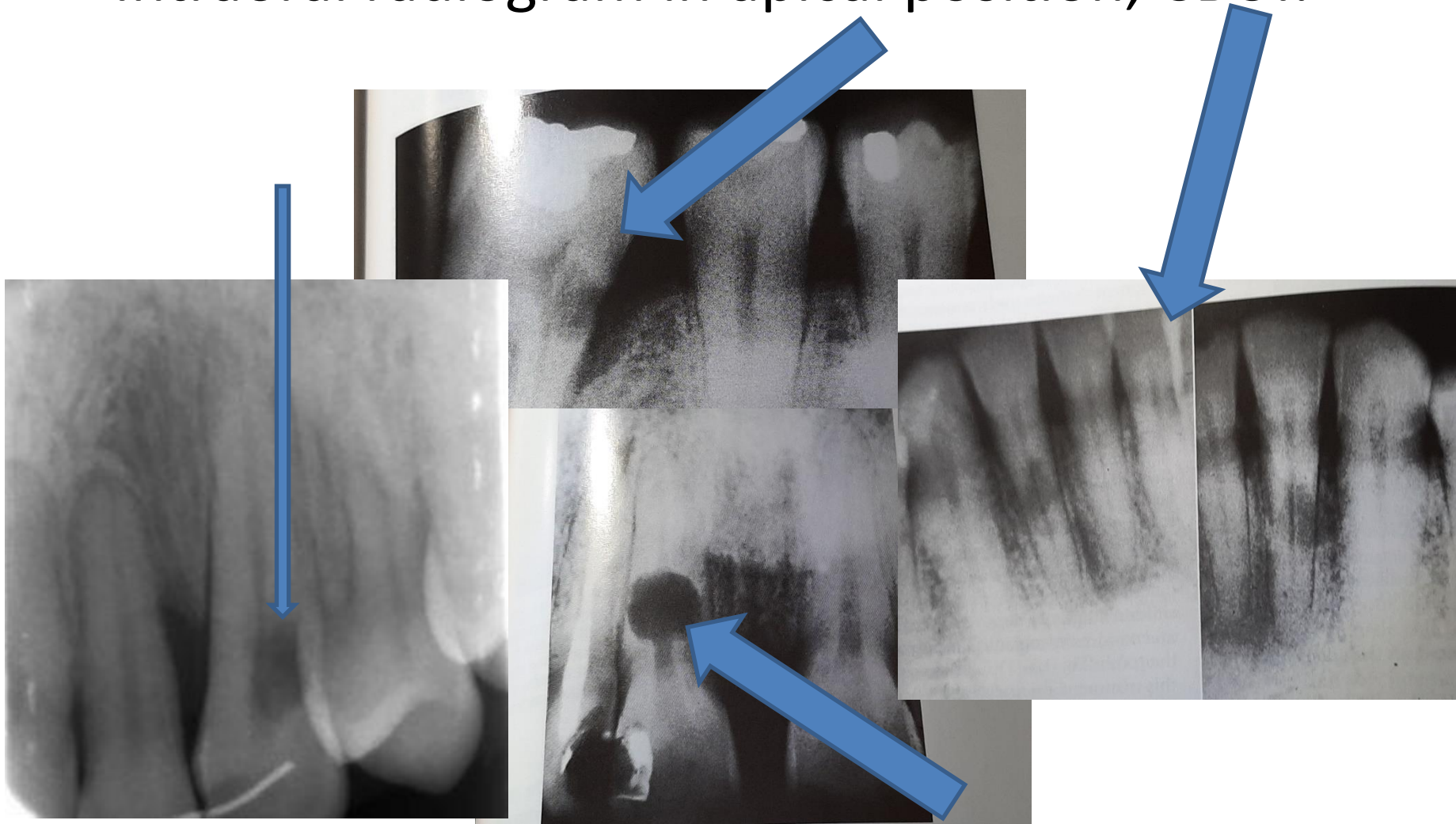
Periodontal pocket

Radiogram with gutta cone



# Rtg diagnosis

- Intraoral radiogram in apical position, CBCT.



# Principles of the therapy

- Elimination of aetiological factors – if possible
- Non surgical therapy
- Surgical therapy



# Zásady terapie

## Nechirurgická terapie

je možná u případů, kdy je defekt příznivě lokalizován z hlediska zevního přístupu, nebo naopak jeho lokalizace znemožňuje chirurgický přístup.

- **Zhotovení výplně:** je možné v případech, kdy se ECIR šíří spíše koronálně. Taková lokalizace je ale poměrně málo častá. Při odstraňování resorptivní tkáně se doporučuje využít 90% roztok kyseliny trichloroctové (TCA). Při jejím použití dochází ke koagulační nekróze resorptivní tkáně. Takto postižená tkáň zbělá a je možné ji snáze odstranit. Je nezbytně nutné aplikovat 90% TCA velmi obezřetně, kvůli riziku iatrogenního poškození okolních měkkých tkání. Jako výplň je materiálem volby fotokompozit. Tento přístup je možno aplikovat u 1. a 2. Heithersayovy třídy. V některých případech vyžaduje ošetření prodloužení klinické korunky zubu (viz dále).
- **Vnitřní přístup (angl. internal approach):** odpovídá endodontickému ošetření a odstranění resorptivní tkáně přes trepanační otvor. Používá se u resorptivních defektů, které jsou lokalizovány nepříznivě a není u nich možné využít některý z chirurgických přístupů. Pro odstranění resorptivní tkáně je nutné využít 90% TCA a následně tuto již koagulovanou tkáň odstranit tvrdokovovými vrtáčky na prodlouženém dříku (např. Mullerův vrtáček, Munceho vrtáčky). TCA je vhodné nanášet pouze na resorptivní tkáň, nejlépe mikroštětečkem, a není vhodné zaplavit celý kořenový systém a resorptivní defekt, neboť tím vzniká výrazné riziko iatrogenního poškození okolních tkání. Mikroskop je potřebný.

# Non surgical therapy

- Filling :

Good approach, dry operating fields, removal of tissues in the lacune using 90% trichloroacetic acid, composite filling or Glassionomer filling

- Internal approach:

Through the root canal, removal of tissues in the lacune using 90% trichloroacetic acid, magnification is necessary. Root canal filling plus adhesive materials.

# Surgical therapy

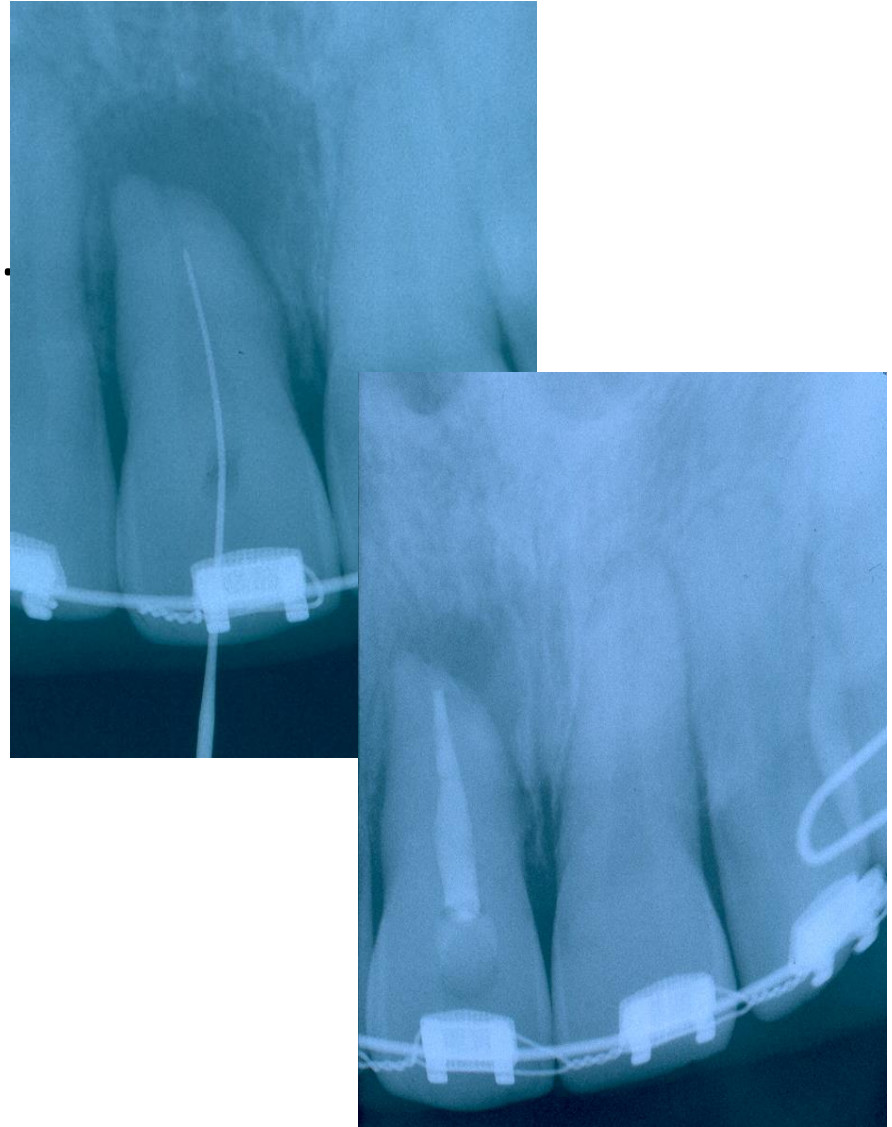
- Flap surgery
  - Raise the flap, cleaning of the resorptive lacune, ostectomy, filling of the lacune. GIC, composite filling.
  - If the defect is large - endodontic treatment is necessary too.

# Prevention of resorptions

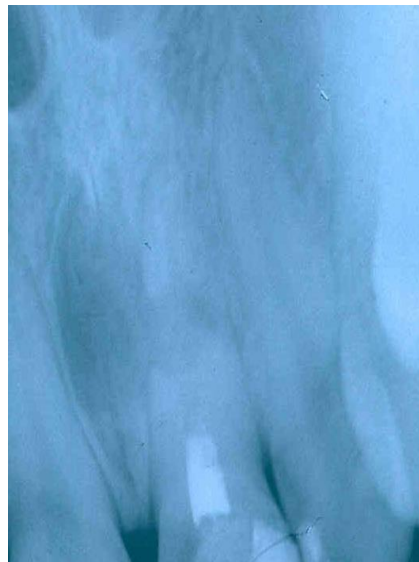
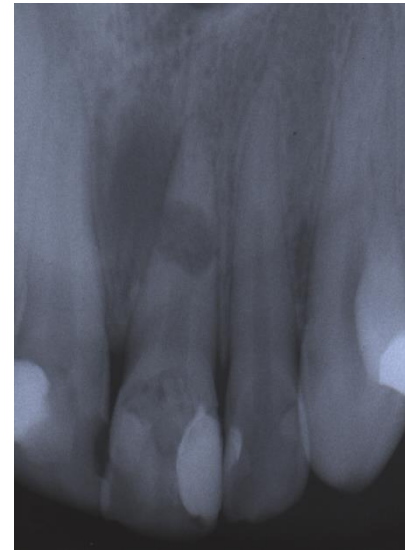
- The patient must be in the dispensary care. When trauma, autotransplantations, surgical orthodontics are in the history.
- Careful extractions
- Careful orthodontic treatment
- Careful rubberdam technique
- Careful subgingival treatment

# Resorption during ortho treatment

- The root is shortened - cut.
- The spontaneous healing is possible
- Endodontic treatment is not indicated
- Apical radiolucency is not apical periodontitis.

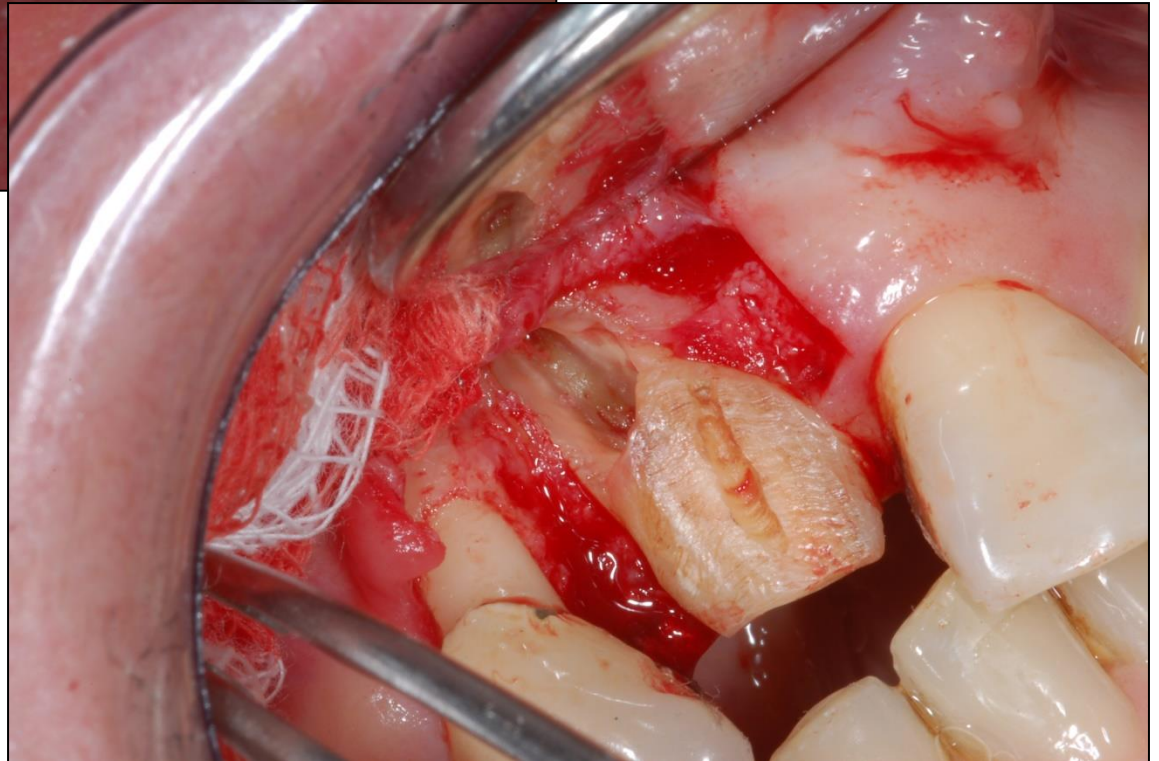


External resorption, asymptomatic  
Calciumhydroxide therapy,  
replacement with bone.  
The root can be left.

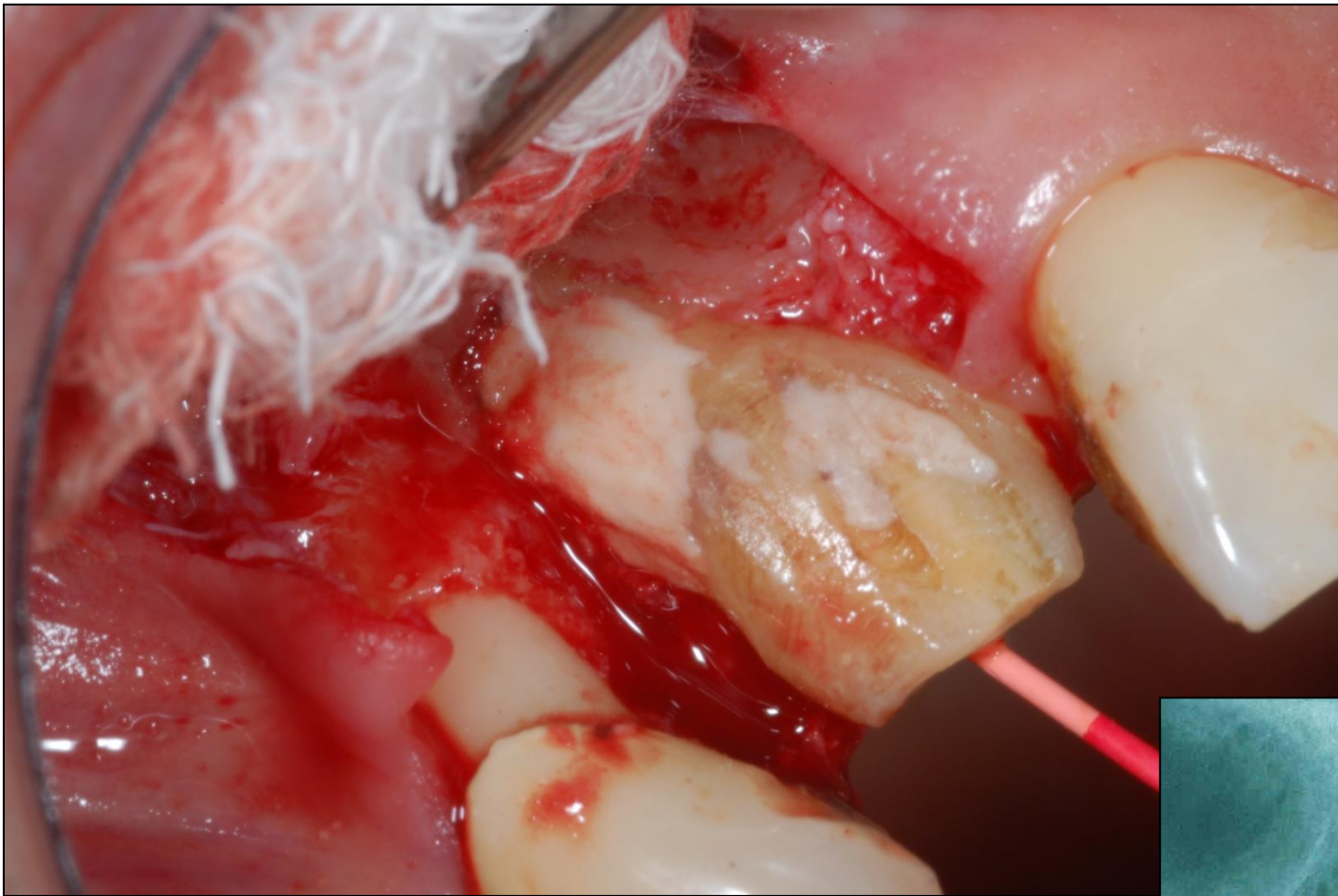


# External cervical invasive resorption





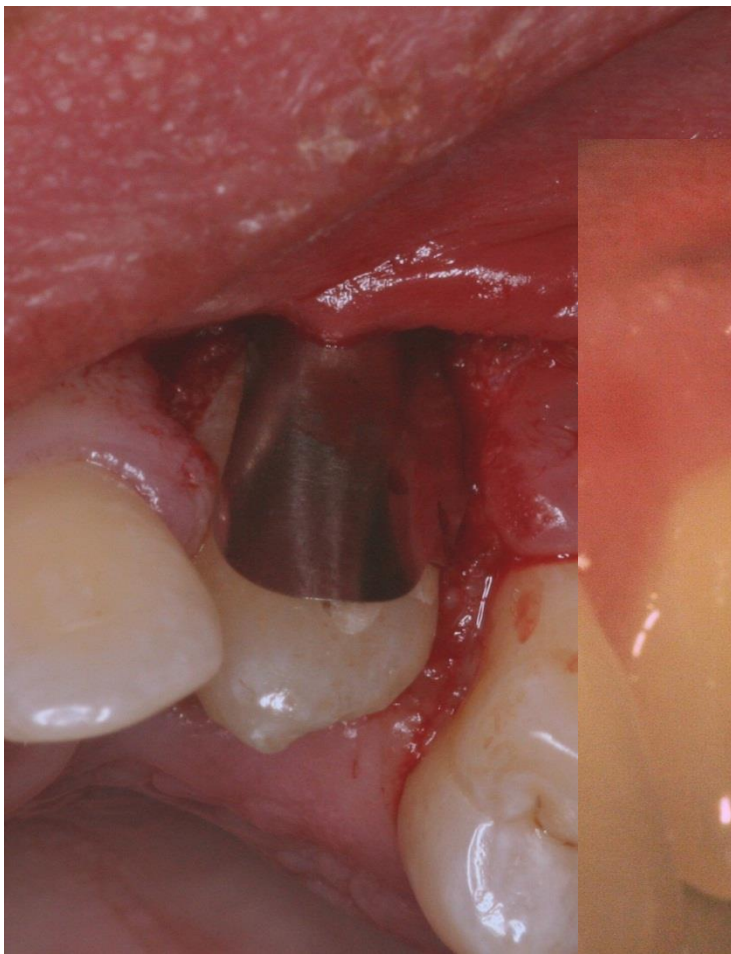


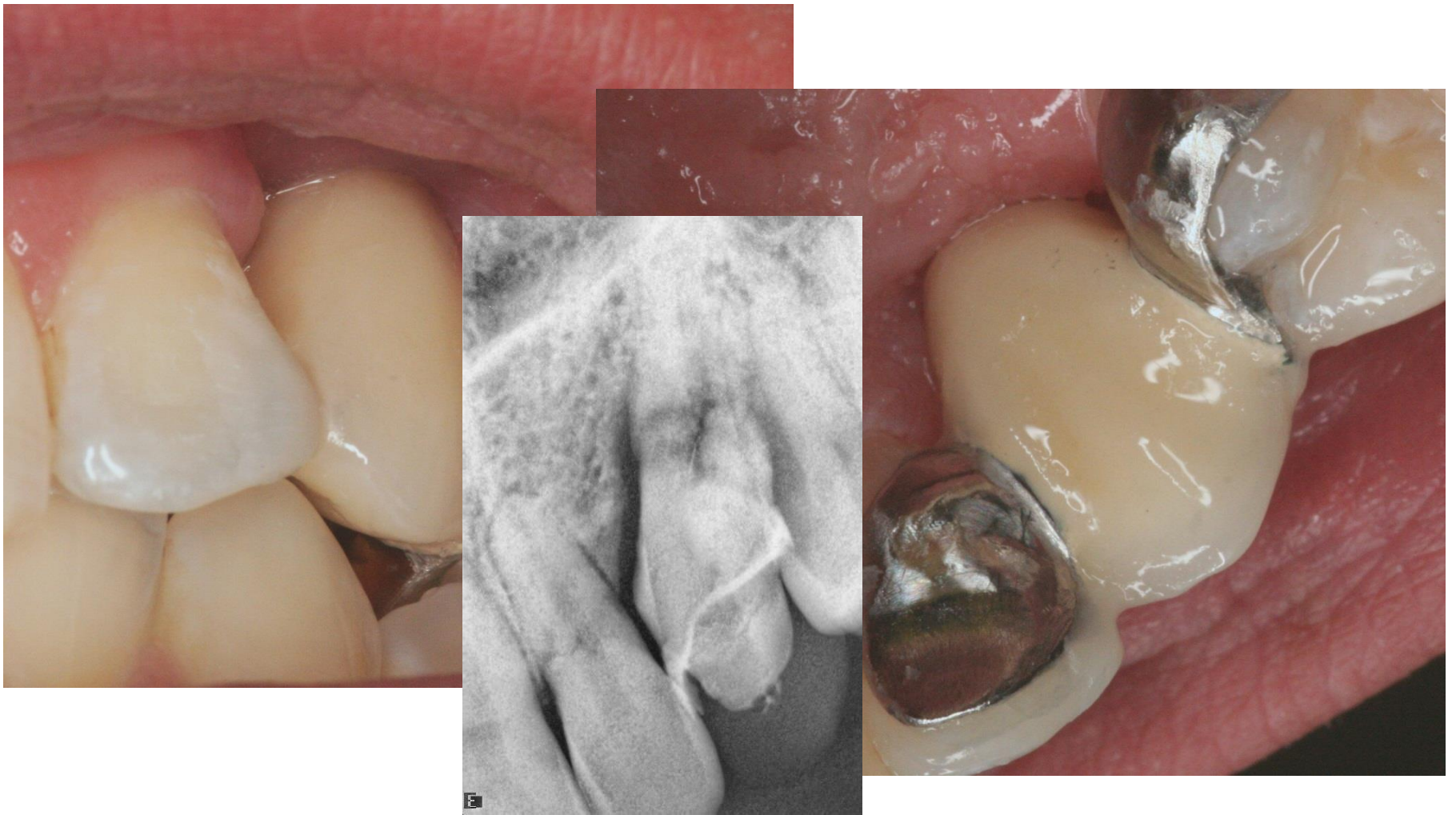












The story continues....

# Differential diagnosis

- Internal resorption:

Vitality test usu negative, the radiolucency is inside the root canal- its position is the same when two projections are taken.

- External resorption:

Vitality test is usu positive, the radiolucency is outside the root canal – the position is different when two projections are taken.

Thank you