
3rd year, 2nd semester
Aims of RCT

- Eliminate the patient’s complaint and pain
- Avoid extraction
- Prevent pulpal infections to reach the periapical area
- If periapical tissues are infected, eliminate the infection by curing the primary disease
Indications for endodontic therapy

- Irreversible inflammations of the pulp
- Pulp necrosis
- Accidental pulp damage (tooth preparation, trauma)
Indications for endodontic therapy

- Teeth with perfectly vital pulps:
  - Hypererupted teeth
  - and drifted teeth, that must be reduced drastically (that pulp is involved)
  - If post and core placed for retention
  - If tooth is badly discolored by tetracycline ingestion
Relative contraindications of RCT

- Elderly patients with narrow root canals
- General health state:
  - Rheumatic fever, infective endocarditis (AB prophylaxis)
  - Diabetes mellitus
  - Chr. leukaemia, tumor
  - Haemophilia
  - Preganancy
  - Severe bone lesions
Absolute contraindications of RCT

- Extensive parodontopathy
- Severe destruction of tooth material
- Untreatable root fracture
- Anatomical variations (rct impossible)
- denticulus, hypercalcification
- Open foramen (apexification, apexogenesis)
Absolute contraindications of RCT II.

- Root perforation (inner resorption, errors during access cavity preparation)
- Incorrect root canal filling
- Aseptic conditions can not be provided
- Patient refuses treatment
Considerations prior to endodontic therapy

- Is the tooth needed or important (does it have an opponent, abutment tooth)?
- Is the tooth salvageable, or badly destroyed?
- Is the entire dentition broken down?
- Is the tooth serving esthetically?
- Is the tooth severally involved periodontally?
- Is the practitioner capable of endod. th.?
Age and health as considerations I.

- Age need not be a determinant in endodontic therapy
- In severe cases root canal treatment is far less traumatic than extraction:
  - Heart disease
  - Diabetes
  - Radiation necrosis
  - Blood disorders
Health as considerations II.

- Endodontics is preferred over extraction even for terminal cases of:
  - Cancer
  - Leukemia
  - AIDS

- Pregnancy in the second trimester is usually a safe time for treatment
Periodontal lesion

- Is the lesion of periodontal or endodontic origin, or is it combined situation?

- Lesions of endodontic origin will respond satisfactorily to endodontic treatment
Endodontic diagnostics

- Anamnesis
- Clinical examination
  - Vital signs: blood pressure, pulse rate and respiration, temperature, cancer screen
  - Extraoral examination
  - Intraoral examination
History, anamnesis

- Present dental illness (questions):
  - How long have you had this problem?
  - How painful is it? When does it go away?
  - How often does it hurt?
  - When does it hurt? What makes it hurt?
  - What kind of treatment have you had?

- Medical history:
  - Illnesses, medications, history of bleeding
Intraoral examination

- Transillumination
- Coronal evaluation
- Pulpal evaluation
  - Clinical endodontic tests
  - Percussion
  - Palpation
- Periodontal evaluation
- Radiographic examination
Clinical endodontic tests

- Thermal tests: cold or hot stimuli
- Cold stimuli:
  - Cold drink, ice stick
  - Ethyl chloride
  - Fluorine-methane spray
  - Carbon dioxide dry „ice” stick
- Hot stimuli:
  - A stick of heated gutta-percha or hot water
  - It can help locate a symptomatic tooth with necrotic pulp
Percussion

- Very gently tap the occlusal surfaces of teeth
- Tender to percussion: sign of periapical inflammation
- Apical periodontitis: an extension of pulpal inflammation, it may also result from:
  - Impact trauma
  - Traumatic occlusion
  - Sinusitis affecting maxillary teeth
Palpation

- Sensitivity to finger pressure on the mucosa over the apex of a tooth
- Fluctuation is palpable
ELECTRIC PULP TESTERS

- The principle of the EPT is to raise the electrical potential through the enamel and dentine into the pulp to provoke a measurable response (tingling, warm, pain,) from the pulp.
- The stimulus may be in the form of direct current (DC) or AC and both may be applied with different frequencies.
- Electrical stimulation of nerves within the pulp depends on the rate of current increase, its strength (voltage or current) duration or frequency.
Periodontal evaluation

- Areas surrounding the tooth should provide a good picture of periodontal support
- Gingival and sulcular bleeding and drainage
- Presence of plaque and calculus
Radiographic examination

- Root anatomy
- Conditions inside the tooth (pulp stones, internal resorptions)
- Conditions outside the tooth (external resorption)
- Periradicular lesions (resorption, osteitis, apical abscess, cyst, osteofibrosis, cementoblastoma, hypercementosis)
Radiographic examination

- Pulpal lesions affect soft tissues -> no rad. signs
- Rad. Signs have a delay of 8-10 days after clinical complaints appear
- 30-60% demineralisation is needed to have a radiographic sign
Diagnosis

- Practically we use a simplified diagnostic system based on histologically and clinically detectable alterations
- **We use the same therapy in case of different pulp diseases**
Diseases of the pulp

- Pulp hyperaemia (reversible pulpitis)
  - Irreversible pulpitis
    - Necrosis
  - Periodontitis
  - Periostitis
- Osteomyelitis
- Phlegmone
Vital pulp

- Positive response to sensitivity tests
- The pulp is covered by sound and hard dentin layer
- No clinical sign of inflammation
- No radiographic sign of inflammation
Hyperaemia

- No spontaneous pain
- Sharp pain evoked by stimuli
- The pain takes only until the duration of stimuli
- No sensitivity to percussion
- No radiographic sign of inflammation
Acut pulpitis

- Sharp, throbbing pain
- Spontaneous pain or the pain is evoked by stimuli
- Pulpitis attack especially in the night
- Hard to localize (total)
- No radiographic sign of inflammation
- Mild sensitivity to percussion is possible
Chronic pulpitis

- Mild, diffuse pain
- Sensitivity to hot stimuli
- Mild sensitivity to percussion possible
- X-ray: calcification in the pulp, denticuli (dentin stones)
- Pulp polyp: granulative tissue in the decayed lesion, mild sensitivity, mild bleeding (primary teeth)
Gangrene

- The pulp tissue necrotises due to the disturbance of blood flow
- No spontaneous pain, no pain for stimuli (except hot stimuli)
- Mild sensitivity to percussion possible
- Discoloration of the crown (grey)
- No radiographic sign
- Gangraena humida: (strong, bad smell)
- Simple/complicated
Periodontitis acuta

- Negative response to sensitivity test, but the tooth can be sensitive to hot stimuli
- Pain for percussion or mastication
- Elongation of the tooth
- The patient is able to localize the tooth
- X-ray: widened PDL (periodontal ligament), bone resorption
- Swelling on the mucosa, subfebrility is possible
Chronic periodontitis

- Mild symptoms
- Intermittent sensitivity to percussion
- No sign of vitality
- Discoloration
- X-ray: widened PDL, bone resorption, granuloma or cyst
- Sensitivity of lymph nodes
Periostitis

- Sharp pain
- Intense pain to percussion
- Reddish swelling of the mucosa
- Submucous abscess: relieving pain
- Fever, fatigue, sensitive lymph nodes
Osteomyelitis, phlegmone

- Most severe forms of inflammation
- Osteomyelitis: inflammation of the bone marrow
- Phlegmone
# Differential diagnosis I.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Localisation</th>
<th>Tender to percussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYPERAEMY</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>PP.AC.PART.</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>PP.AC.TOT.</td>
<td>-</td>
<td>Rare</td>
</tr>
<tr>
<td>PP.CHRON.</td>
<td>+</td>
<td>(+++)</td>
</tr>
<tr>
<td>GANGRAENA</td>
<td>+</td>
<td>+-</td>
</tr>
<tr>
<td>PERIOD.AC.</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>PERIOD.CHR.</td>
<td>+</td>
<td>+-</td>
</tr>
<tr>
<td>PERIOSTITIS</td>
<td>+</td>
<td>+</td>
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</tbody>
</table>
Differential diagnosis II.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Stimulus</th>
<th>Rtg signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYPERAEMY</td>
<td>Cold, heat</td>
<td>-</td>
</tr>
<tr>
<td>PP.AC.PART.</td>
<td>Cold</td>
<td>-</td>
</tr>
<tr>
<td>PP.AC.TOT.</td>
<td>Cold, heat</td>
<td>-</td>
</tr>
<tr>
<td>PP.CHRON.</td>
<td>Cold</td>
<td>(+)</td>
</tr>
<tr>
<td>GANGRAENA</td>
<td>Heat</td>
<td>+</td>
</tr>
<tr>
<td>PERIOD.AC.</td>
<td>Heat</td>
<td>+</td>
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<tr>
<td>PERIOD.CHR.</td>
<td>Heat</td>
<td>+</td>
</tr>
<tr>
<td>PERIOSTITIS</td>
<td>Heat</td>
<td>++</td>
</tr>
<tr>
<td>Condition</td>
<td>Type of pain</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>HYPERAEMY</td>
<td>Only by stimulus</td>
<td></td>
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<tr>
<td>PP.AC.PART.</td>
<td>Spontaneous</td>
<td></td>
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<tr>
<td>PP.AC.TOT.</td>
<td>Sharp, throbbing, at night</td>
<td></td>
</tr>
<tr>
<td>PP.CHRON.</td>
<td>Not typical</td>
<td></td>
</tr>
<tr>
<td>GANGRAENA</td>
<td>Not typical or by stimulus</td>
<td></td>
</tr>
<tr>
<td>PERIOD.AC.</td>
<td>By bite</td>
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<td>Spontaneous or -</td>
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