Pulp therapy

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Endodontics in pediatric dentistry

• Primary teeth- to keep the tooth in function as long as exfoliation or at least until it is needed for occlusal development
• IMPORTANT – only when the underlying germ is not in a risk
Immature permanent teeth

- Maintain continuing root development
- Keep the function
diagnostic criteria pulpal conditions

- Increased mobility
- Terdeness on percussion
- Sensitivity
- Xray pathological changes
- Extensive bleeding
- toothache
Differentiation between

• vital → non-vital
• Healthy pulp tissue → inflamed tissue
• Totally → partially

MORE IN the lecture of Dr. Nemes: consecutive diseases
Endontics for primary

• Problem:
  – There is not a worldwide accepted one and only method.
  – Different countries using different methods

• Difficulties in diagnosis and in treatment plan
  – Small child cannot give proper answers
  – Vitality test are not reliable
  – Not enough objective signs
Pulp of the deciduous teeth

• It vary from the pulp of permanent teeth in morphology, and histology
• They differ in their reaction to adverse stimuli and various pulpal medication
• It may be threatened in several ways (rapid caries, traumatic injuries, iatrogen over preparation)
Proper diagnosis

- Careful evaluation of the patient’s historical information
- Clinical examination
- Accurate radiographic interpretation
- Child’s overall health status
- Overall dental health
- Reliability for follow up assessment and care
- Restorability
- Child’s cooperative ability
- Parent’s motivation, financial situation
PULPAL DIAGNOSIS Factors for evaluation

• The extent of caries and its proximity to the pulp
• Previously placed restoration proximity to the pulp
• Previously performed pulpal therapy
• Internal, external resorption
• Width of periodontal ligament space
• Radio lucencies of bone
Pulpotomy in primary molars

• **When** do we perform a **pulpotomy**?
  accidental pulp injuries
  reversible pulpitis
  only the coronal pulp inflammed, the root portion is intact

• **What is** **pulpotomy**?
  Pulp aputation or vital pulpotomy (vital amputation)
  is a procedure in which a portion (coronal pulp) of pulp is removed, and preserving the vitality and function of the remaining (root) portion.
Contraindications

• Spontaneous pain
• Swelling
• Tenderness to percussion
• Abnormal mobility
• Fistulas
• Sulcular drainage
• Internal resorption
• Pulpal calcification
• Pathologic external root resorption
• Periradicular-periapical radiolucency
• Excessive pulpal bleeding
• Putrescent odor
Contrainication II.

- Systemic diseases (cardiac-immuno-diabetes, cancer-bleeding disorders etc.)
- Behavior factors
- Other dental factors
  unrestorable teeth
  tooth before exfoliation
Pulpotomy

Pulpotomy is the extirpation of vital pulp from the coronal chamber followed by medicament placement over radicular pulp and restore the tooth.

Materials:

- Formocresol
- Glutaraldehyde
- Ferric sulphate
- Electrosurgical cautery
- Laser ablation (ND:YAG)
Pulpotomy

- Preoperative radiograph
- Local anesthesia
- Rubber dam (isolation)
- Remove caries
- Endodontic access cavity
- Excavation of coronal pulp (low speed round burr, spoon excavator)
- Haemorrhage control
- Formocresol, ferric sulphate etc...
- Fill pulp chamber (zink-oxide eugenol)
- Restore tooth (stainless steel crowns)
Techniques

• Hemorrhage control: cotton pallet, sterile saline

• Dressing – coagulation necrotic zone:
  – USA, part of UK, part of Germany- formocresol- has been questioned!
  – Other European countries- ferric sulfate
  – Calcium hydroxide but! Only on dried surface - causes chemical injury (Scandinavia)
  – MTA nowadays – far too expensive
MTA and Calcium Enriched Mixture
CEM-cement
Mortal amputation

• Devitalizing paste for 48 hours, temporally carefully filled tooth!!
• Remove and fill the tooth
• Restore the original tooth shape
Pulpectomy

• Extirpation of soft tissue from the coronal and root canals. The canals and the pulp chamber are than filled with a dressing

• Materials
  - Iodoform paste
  - Zinc oxide eugenol
  - N2
  - Endomethasone
  - Calcium hydroxide
Pulpectomy

Indications:

• Evidence of pulpal necrosis
• Persistent bleeding
• Furcation or periapical involvement
• Spontaneous pain
• Buccal or extra-oral swelling and increased mobility
Pulpectomy methods

- Local anesthesia
- Rubber dam
- Periapical-bitewing radiograph
- Remove caries
- Open pulp chamber, endodontic access
- Debride the pulp chamber (canals)
- Irrigate the canals
- Use K-file (it is almost impossible to fully instrument the canals!!!!!)
- Dry
- Fill with the material
- Restore the tooth
Root canal filling materials

• Jodoform (Walkoff-, Maisto-, Tihanyi paste)
• Guttapercha ????
• N2
• Endomethasone
• ZOE
• Calcium-hydroxid
• Calcium-hYdroxid-iodoform (Vitapex, Metapex)
• Calcium Hydroxid in poliethylenglykol paste (Calen)
• ZOE+ Calcium hydroxid+iodoform (Endoflas)
• ZOE + iodoform (RC Fill)
Young permanent

• Partial pulpitis – Cvek pulpotomy-inflamed part of the coronal pulp
  Makes physiologic narrowing of the coronal pulp chamber. Stronger tooth, less prone to fracture. Root formation continues.

• Pulpotomy- the from the whole pulp chamber
Pulpotomy in permanent

- Calcium hidroxide
- MTA
Apexification

NON-VITAL immature permanent (incisor)

• Working length 1.5-2 mm from the radiographic apex
• Prepared canal is filled with non setting calcium hydroxide
• Excess cavity is sealed tightly between appointments
• Monitoring!!!!!! Differs!!!! 1-3-6 month interval (change calcium hydroxide)
• If the canal is closed obturation my be undertaken
• Final restoration
Apexification

- Calcium hydroxide: the formed bridge is porous; has to be changed
- MTA better sealing ability do not have to be changed
Apexification control

• 1. day – acute inflammation (allergic reaction)
• 1 week – immunological reactions
• 1 month change the calcium hydroxide – alkali environment, pluripotent cells etc.
• 6 month bridge formation
• Follow up