Endodontics

Pulpal and periodontal diseases – diagnosis, therapy, prevention

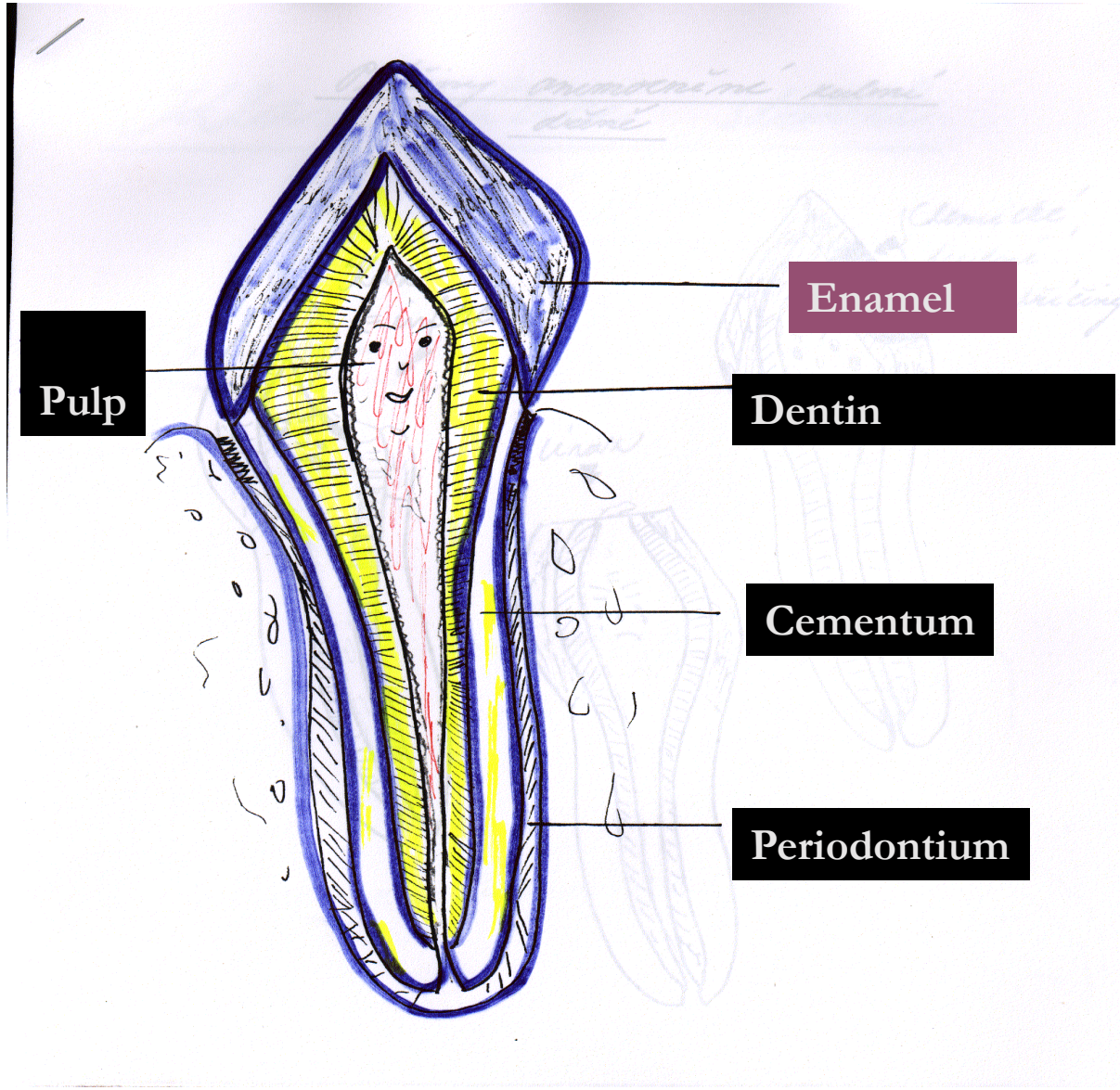
Aim of endodontic treatment

Healing of pulp diseases or removal bacteria from the root canal system and regeneration of damaged periodontal tissues. (Canal shaping, cleaning and filling)

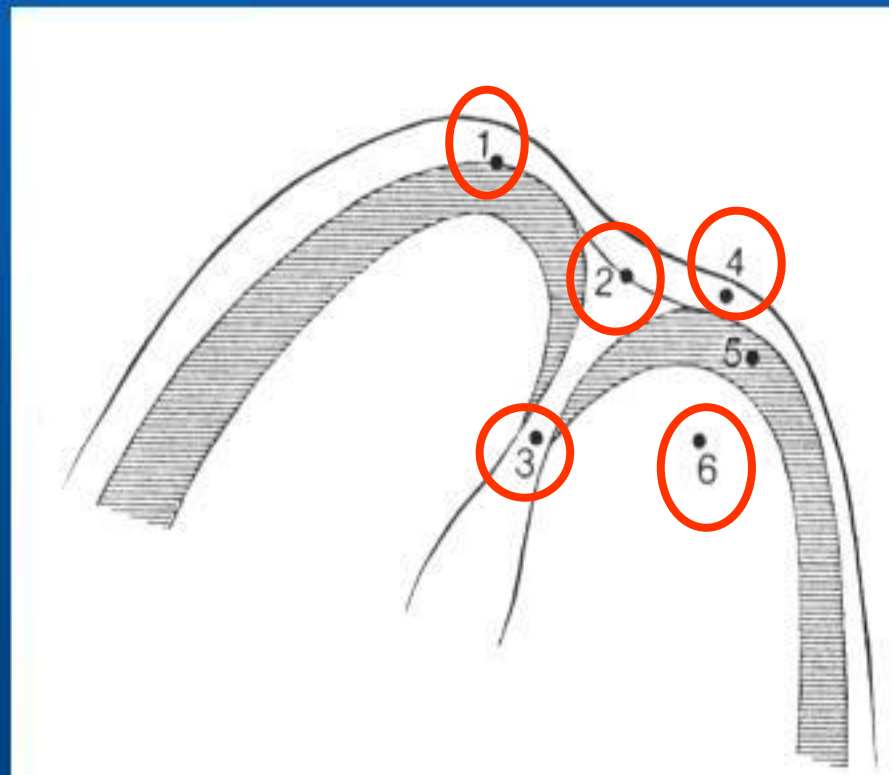
„ Endodontist helps nature only “

W.D.Miller

Morphology

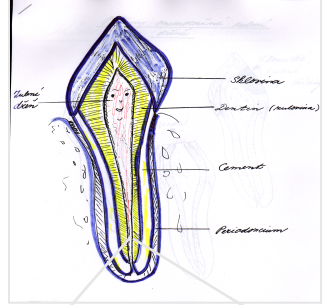


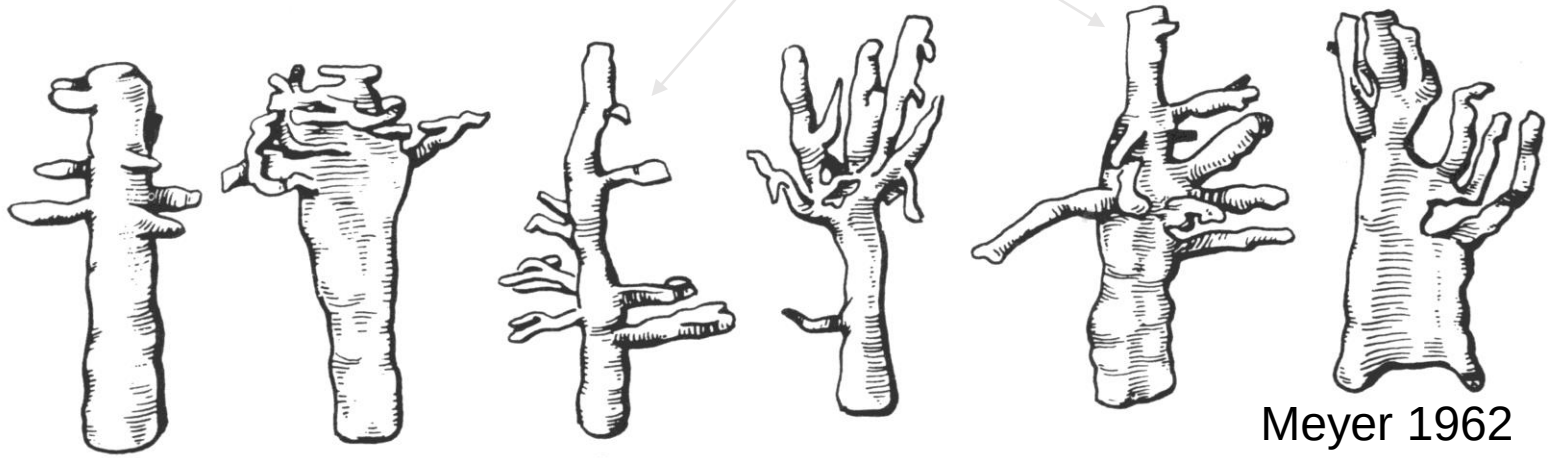
Apical morphology



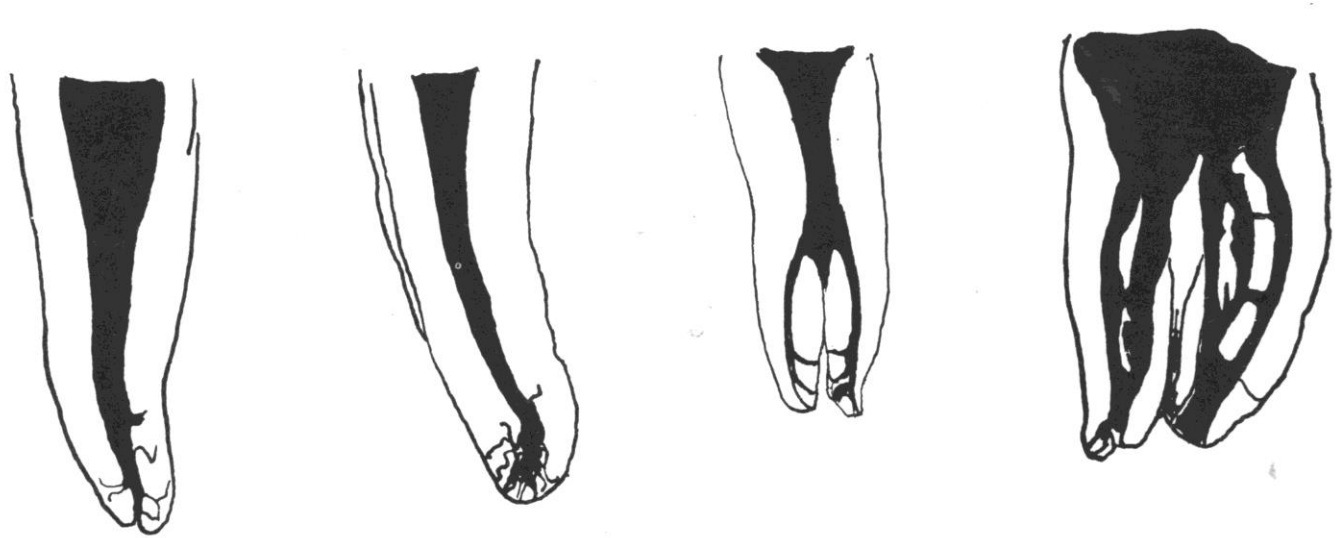
1. X – ray apex
2. Foramen apicale – spical foramen
3. Apical constriction
4. Periodontal ligament
5. Root cementum
6. Dentin

Acc. to Guldener a Langeland





Meyer 1962



3D

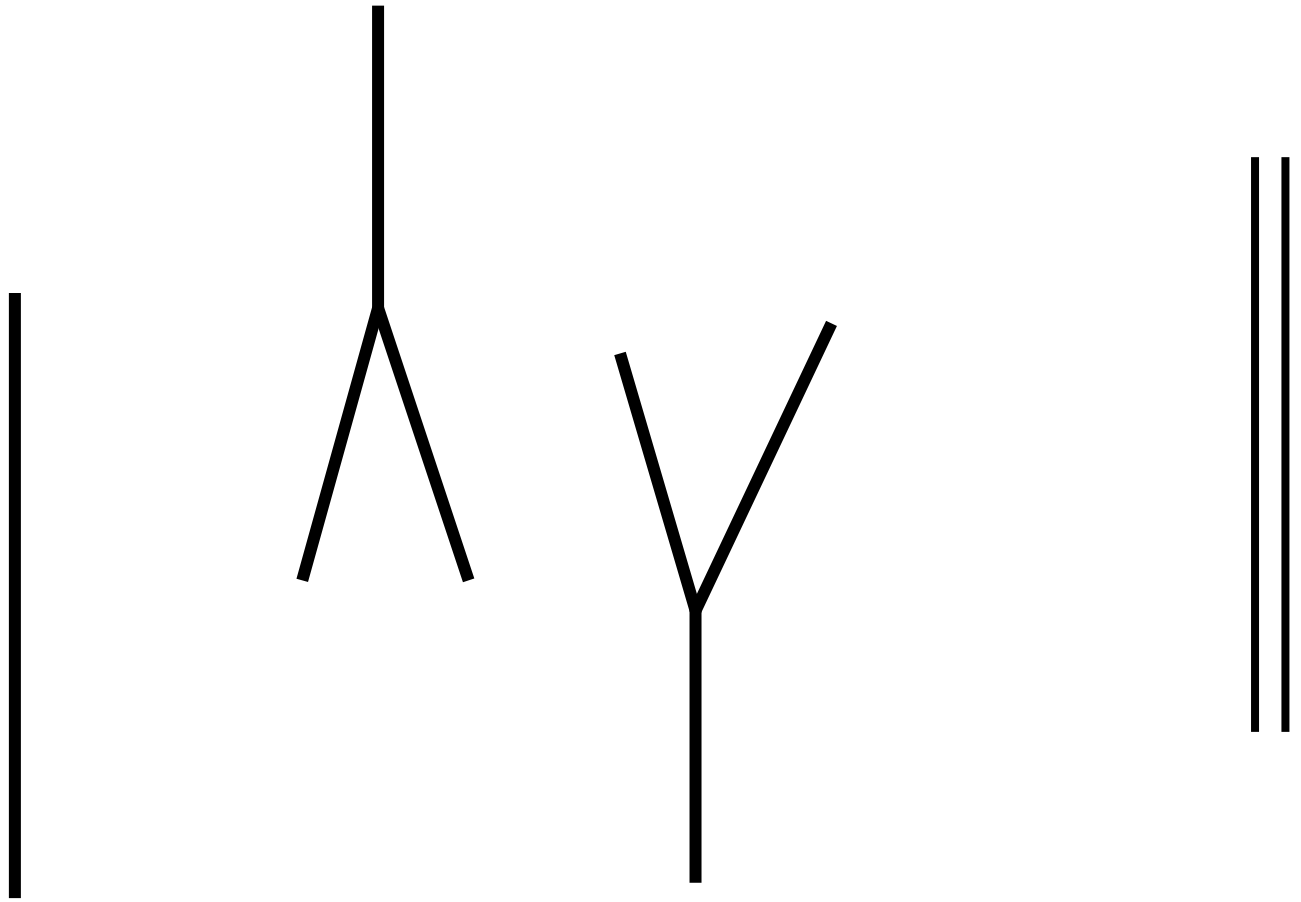
Meyers conclusions

- The root canal is not round but oval (long axis vestibuloral direction)
- The root canal does not go straight but it deflects distally
- The apical foramen is not on the top of the root but below it (distally or distoorally)

Meyer´s conclusions

- The walls of the root canal between apical constriction to apical foramen are divergent
- The root canal system has usually more apical foramina (side branches - accessory root canals– ramifications)
- The ramifications are situated mostly in apical area (first apical mm)
- All foramina are situated in cementum

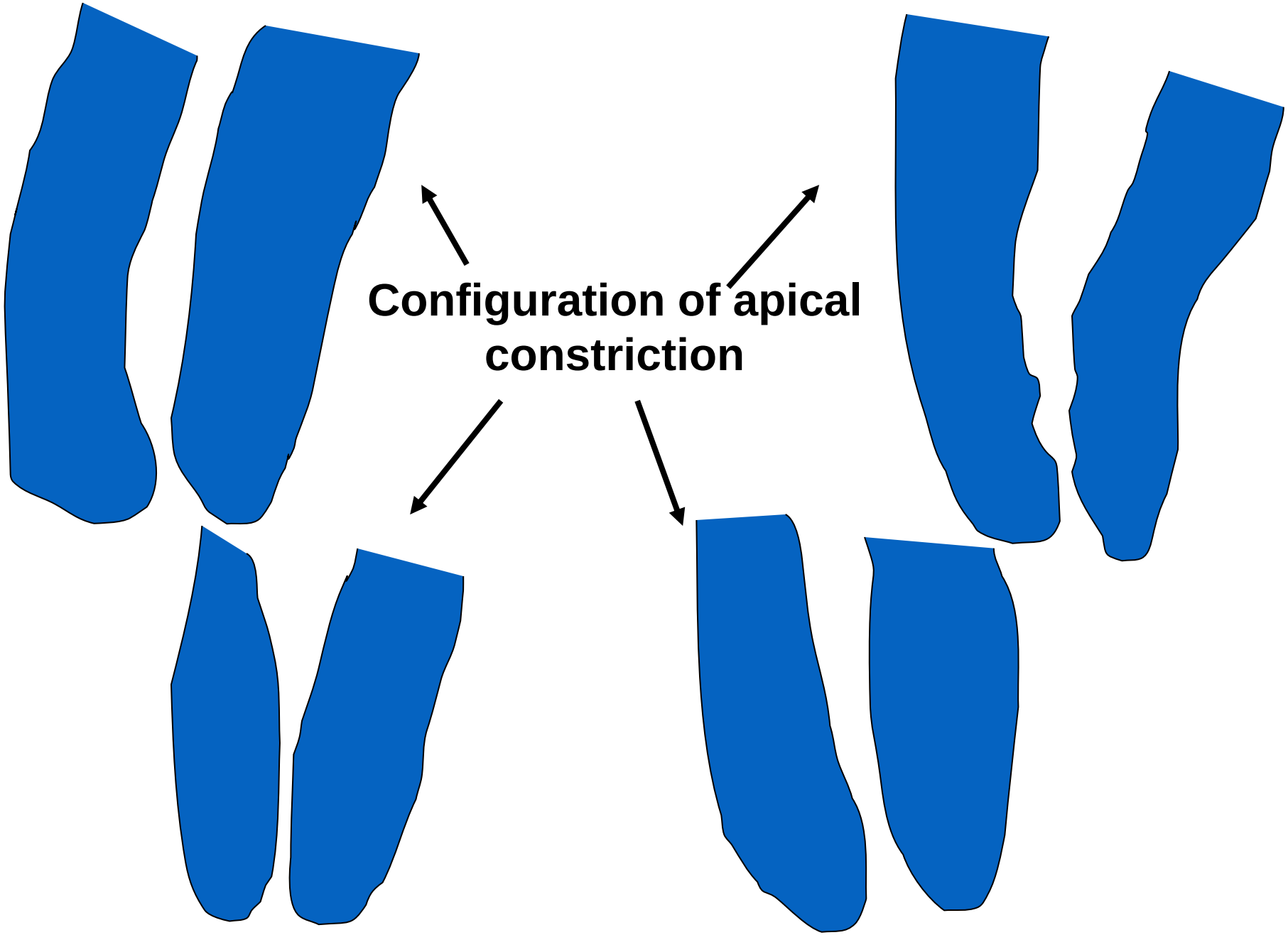
Basic forms of the root canal system (Weine)



Vertucci
Gulabivala
Kartal a Yanikoglu….

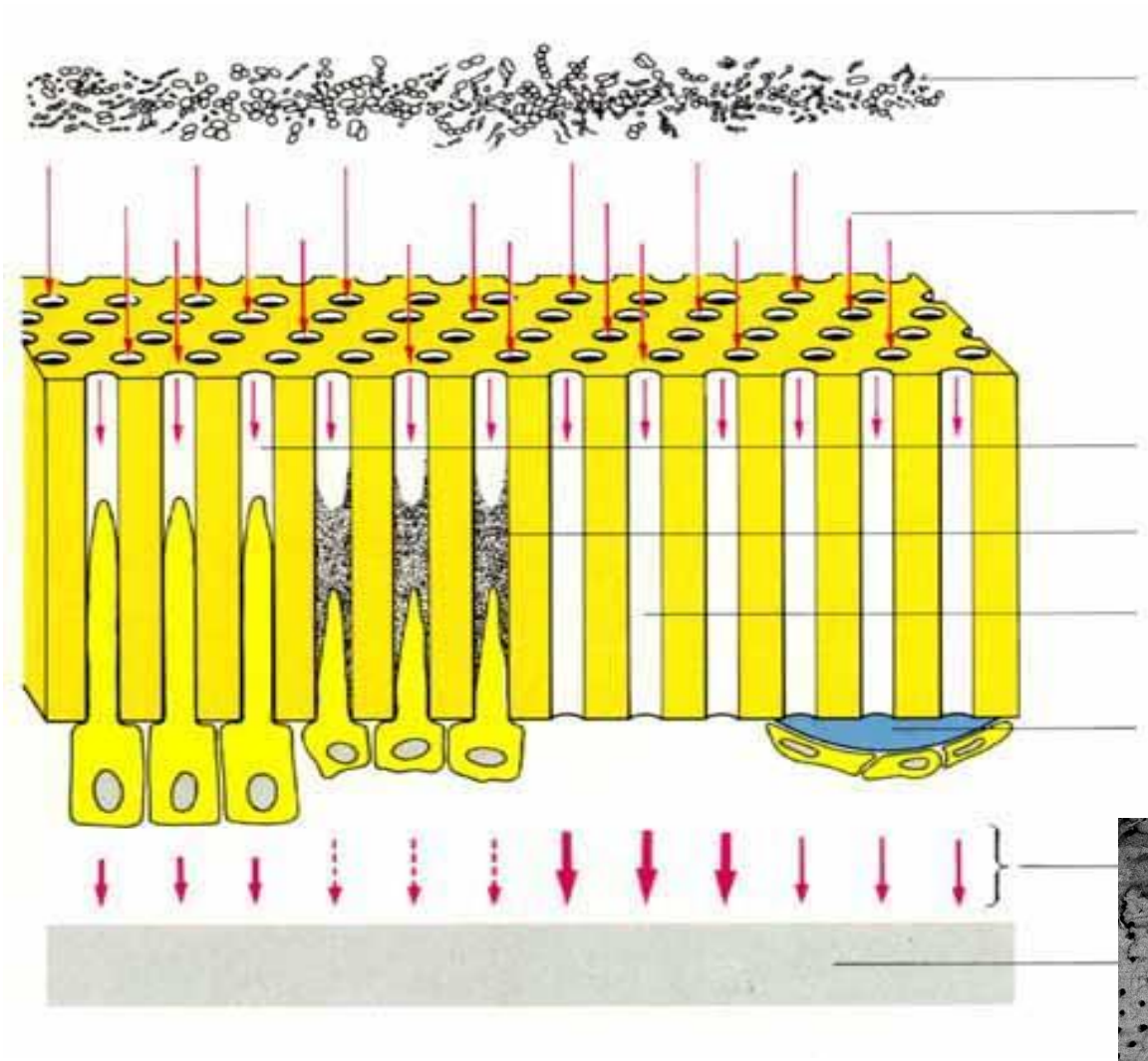
Canal shaping terminates in apical constriction

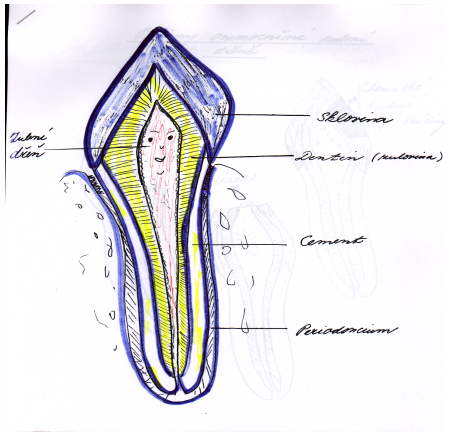
- Small communication
- Less risk of periodontal damage
- Prevention of overfilling
- Prevention of apical transport of infectious material
- Possibility of good bacterial decontamination
- Possibility of good condensation of the root filling

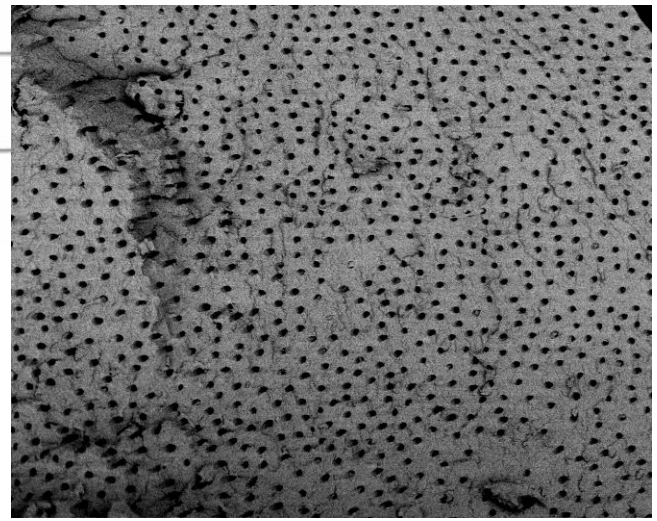

Configuration of apical constriction

- Macrocanal systém – root canals

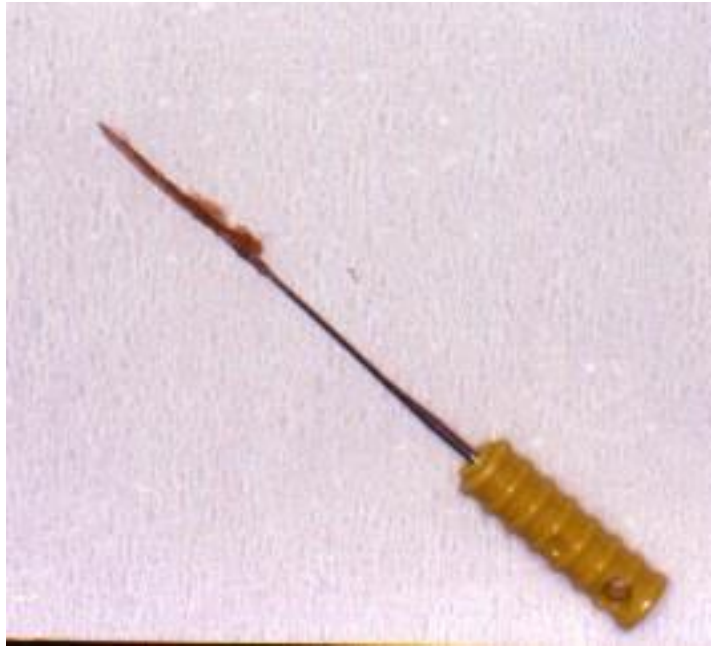
- Microcanal systém – dentine tubules



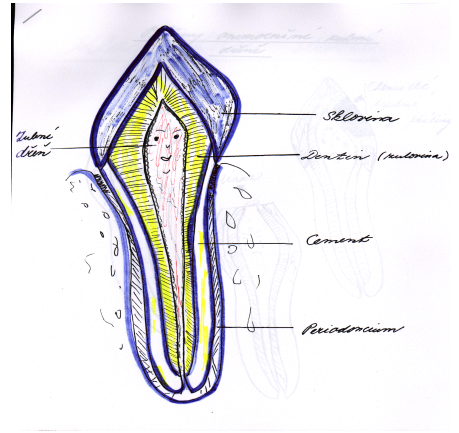


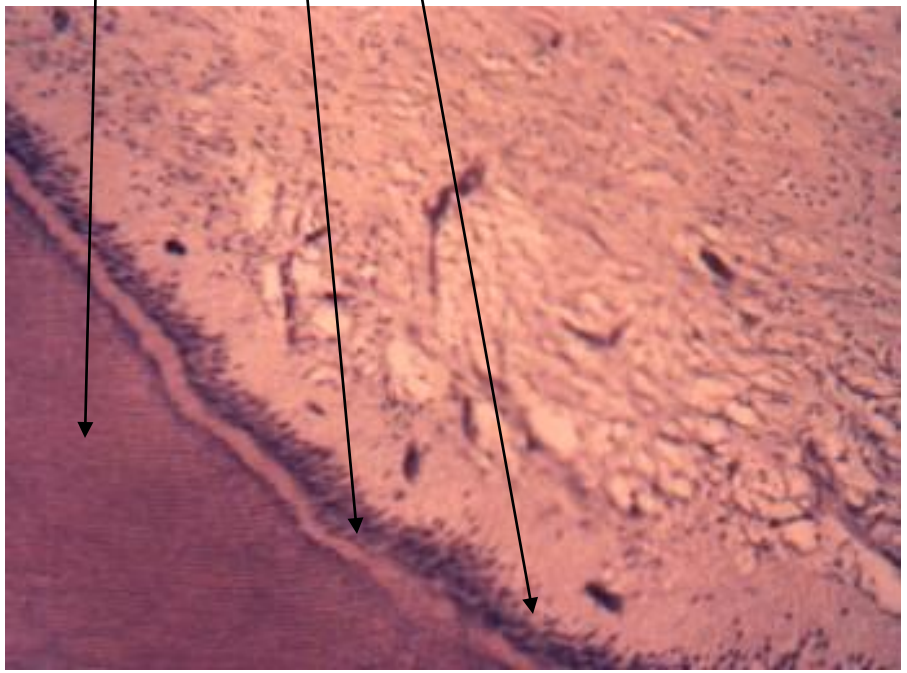


Endodont: dentin and pulp (morphological and functional unit)



Odontoblasts
Predentin
Dentin





Dental pulp

Pulpal response to the irritation

- Sclerosis
- Tertiary dentin
- Dentin bridge

Endodontic diseases

-Pulpitis – reversible, irreversible

- Necrosis (Dental pulp lost its vitality)
- Gangraena (Necrotic pulp became infected)
- Apical periodontitis (inflammation that originates in dental pulp and spreads to the periodontal space)

Reasons

- Bacteria
- Mechanical irritants (overinstrumentation, trauma)
- Chemical (esp. phenolic based inracanal medicaments, overfilling,irrigants)

Two basic approaches in endodontic treatment

- Vital pulp therapy
- Root canal treatment

Vital pulp therapy VPT

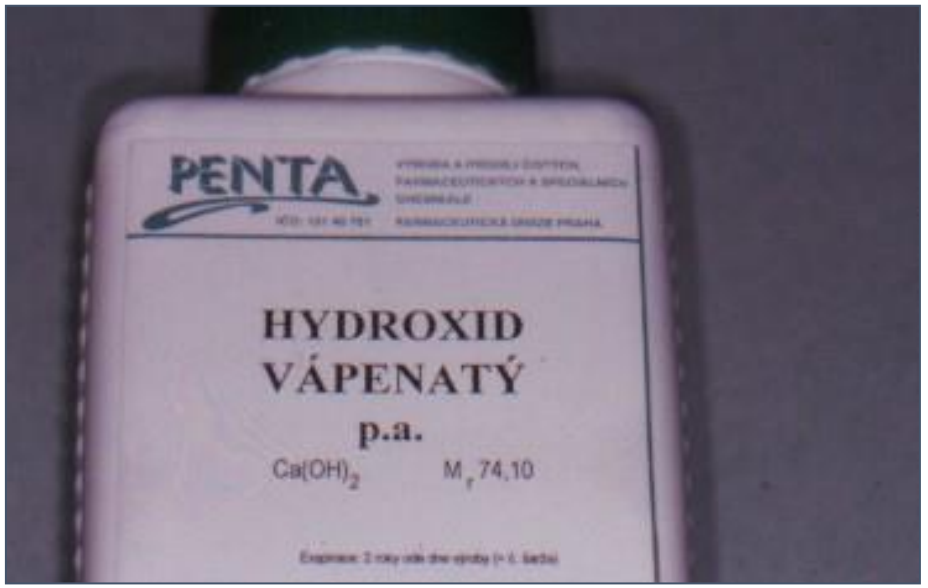
Indirect pulp therapy IPT

- Indirect pulp capping
- Intermittent excavation

- Direct pulp therapy DPT

- Direct pulp capping
- Pulpotomy

Calcium hydroxide

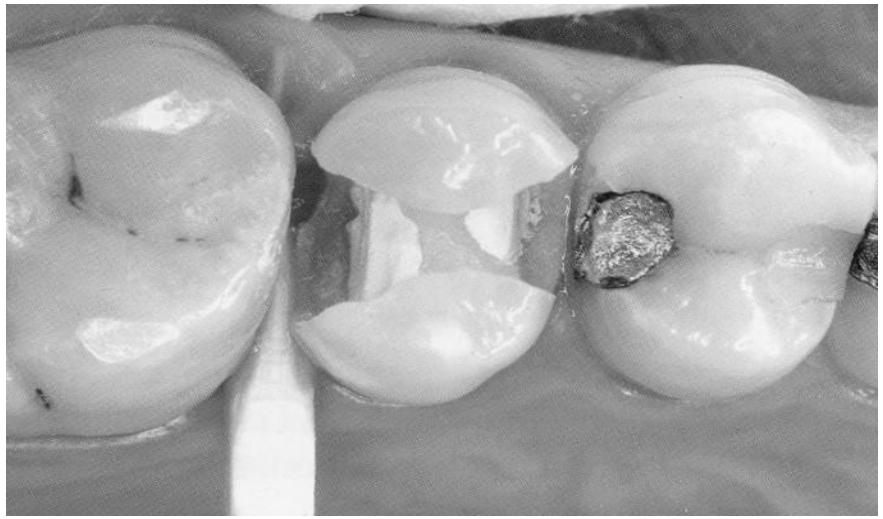


Antiflogistic

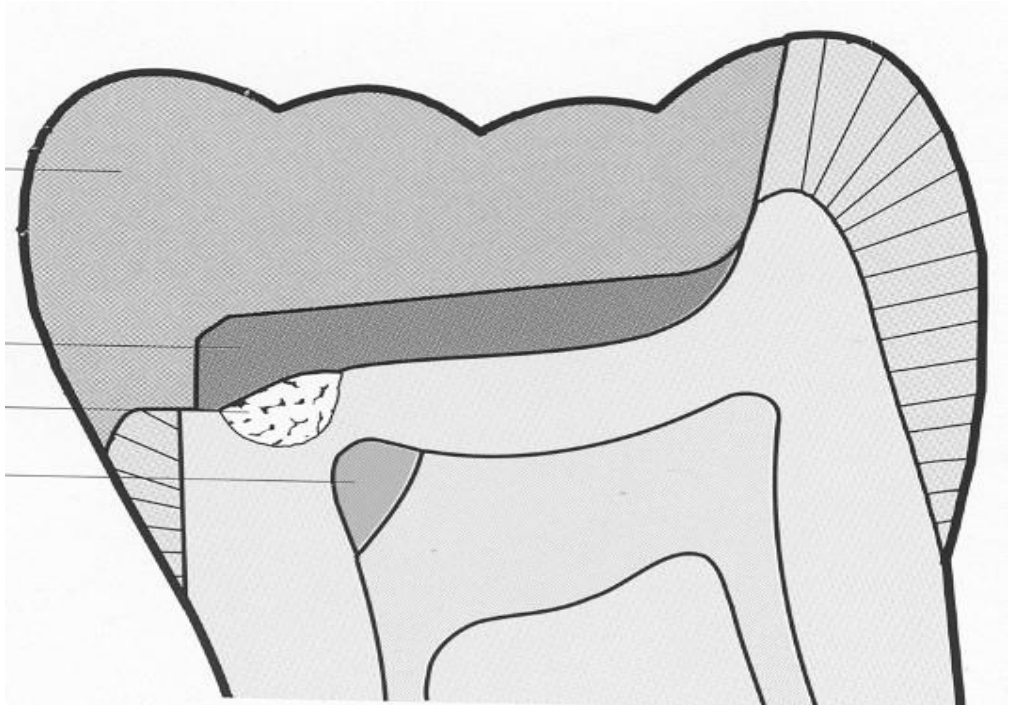
Dentinogenic

Antimicrobial effect

Dry soft dentine



Indirect pulp capping



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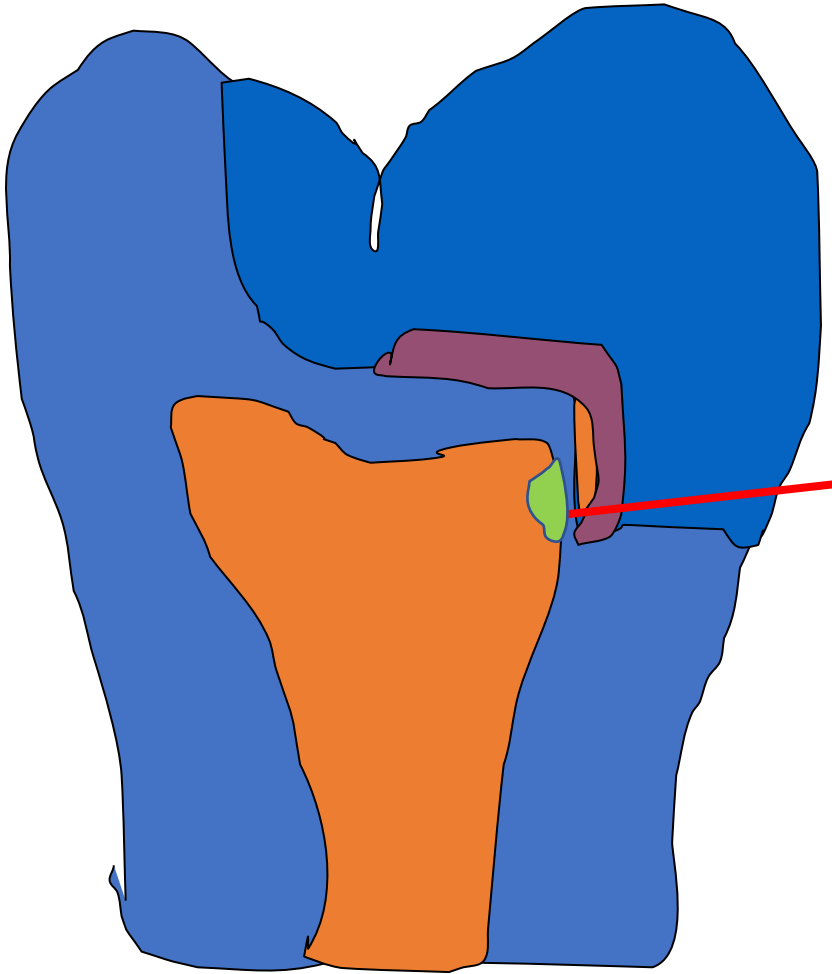
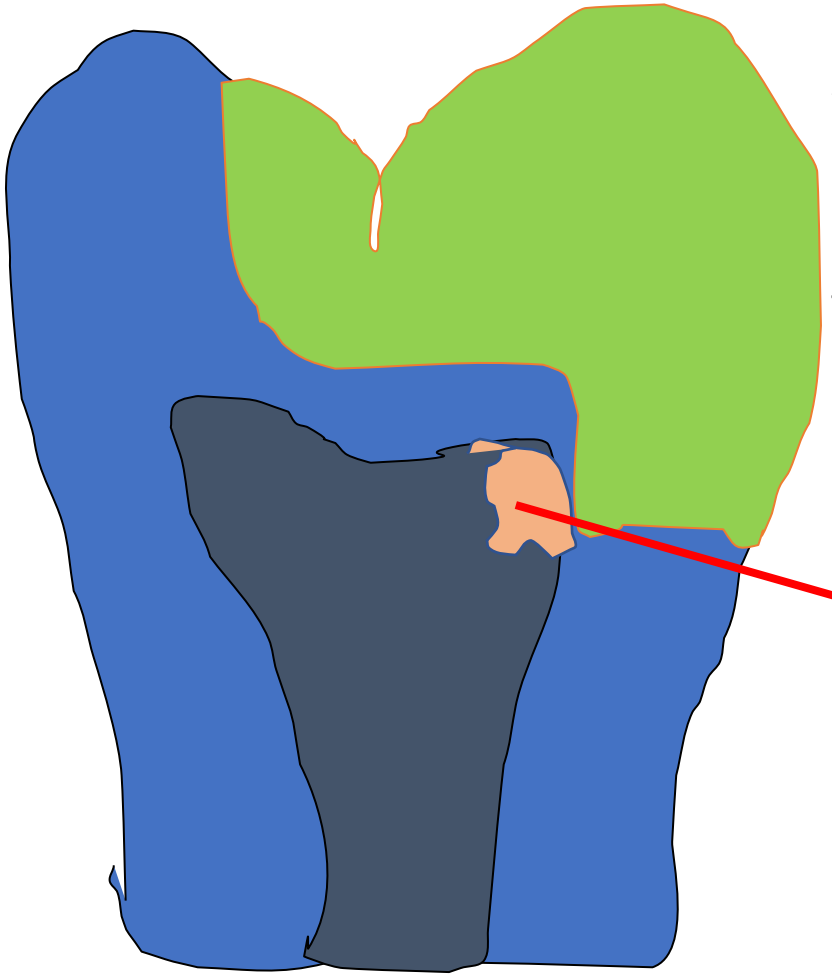


Dental caries next to dental pulp
In a small area small amount
of carious dentine on the pulpal wall
can be left, calcium hydroxide
permanent filling follows.

Tertiary dentin

Intermittent excavation

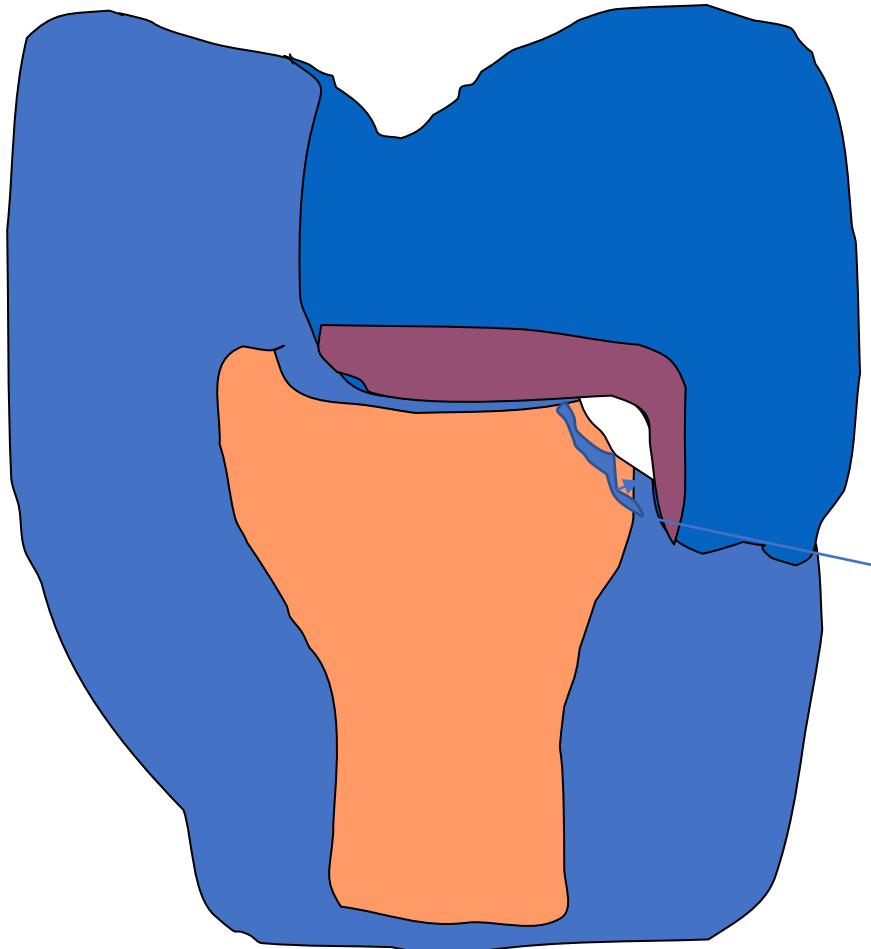


Dental caries next to dental pulp, Big amount of carious dentine. Calcium hydroxide is placed and temporary filling follows.
After six weeks the temporary filling is removed, carious dentine excavated and permanent filling follows

Tertiary dentin is being formed during this period. Calcium hydroxide has also antimicrobial effect and can dry up the soft dentine.

Tertiary dentin

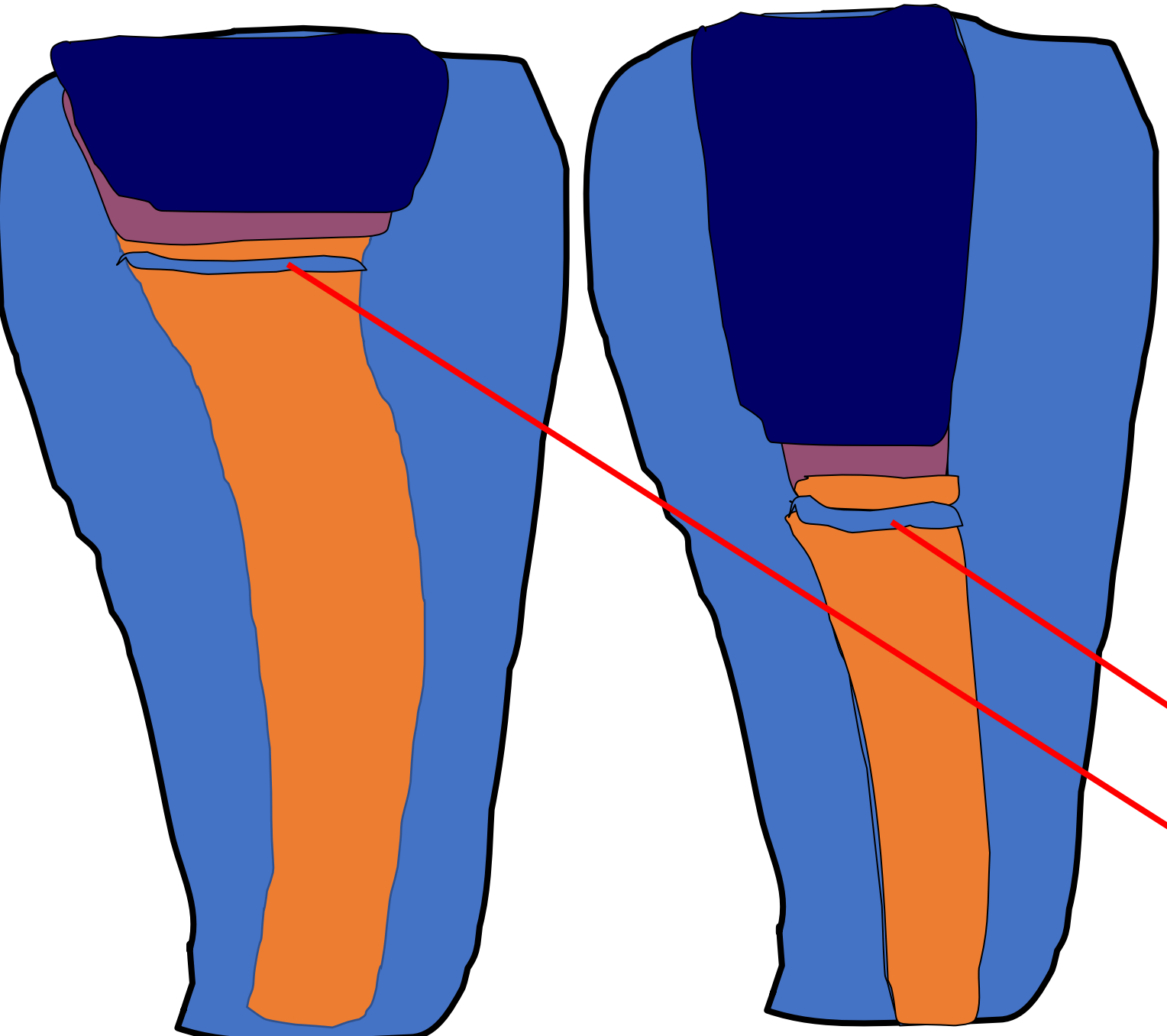
Direct pulp capping



Directly on dental pulp, permanent filling.
Perforation must

- be small (1mm ane less)
- surrounded with intact dentine – no carious
- treated immedietaly

Dentine bridge –
new odontoblasts are differenciated



Pulpotomy

- partial
- total

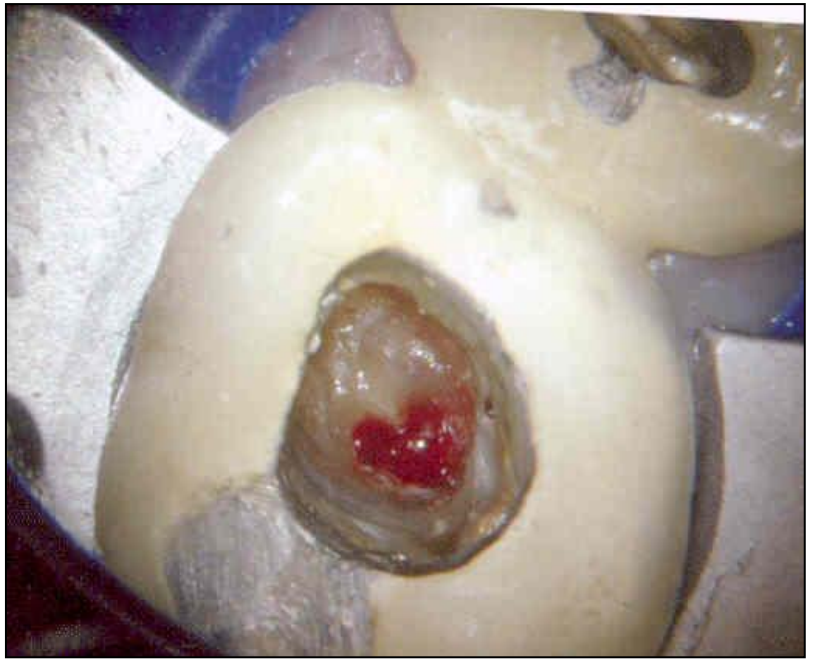
- If the perfofration is bigger
- Surrounded with carious dentine
- Longer time after perforation

Dentin bridge

Dentin bridge

- Dentin bridge :

New dentin that is produced
by new odontoblasts
That differentiate from
stem cells in dental pulp



Root canal treatment - RCT

- Preendo treatment
- Access opening
- Root canal shaping
- Root canal cleaning
- Root canal filling
- Postendo treatment