

Endodontic treatment – root canal shaping

Phases of the endodontic treatment

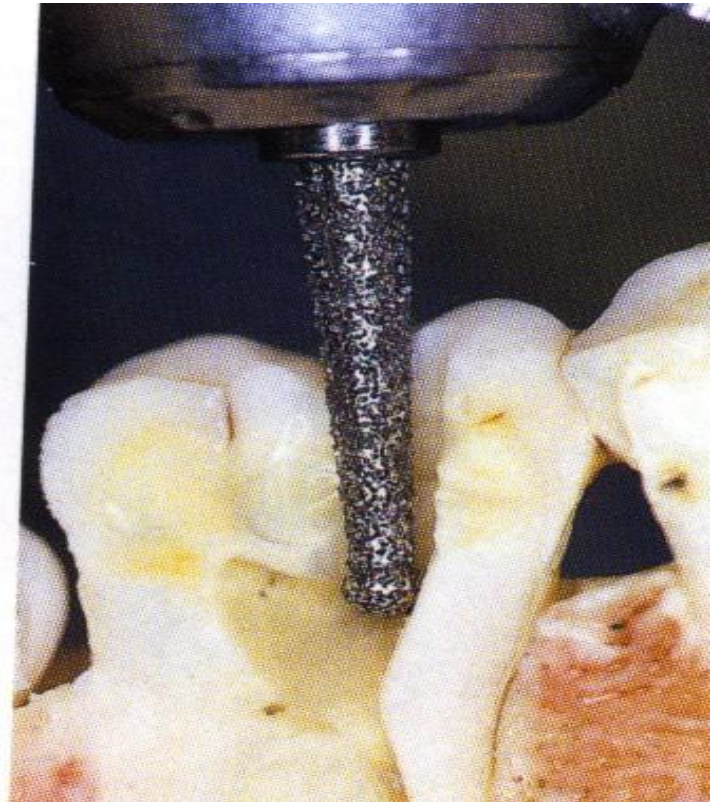
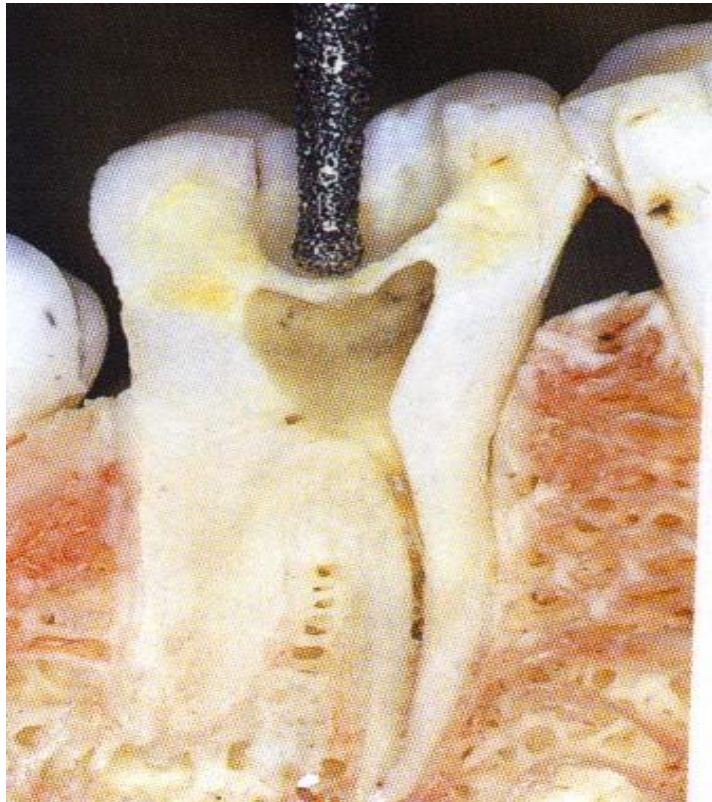
- **Investigation, diagnostic radiogram, consideration (local, regional, systemic factors)**
- **Removal of old fillings, carious dentin, temporary restoration - contours of treated tooth.**
- **Dry operating field**
- **Preparation of the access (endodontic cavity)**



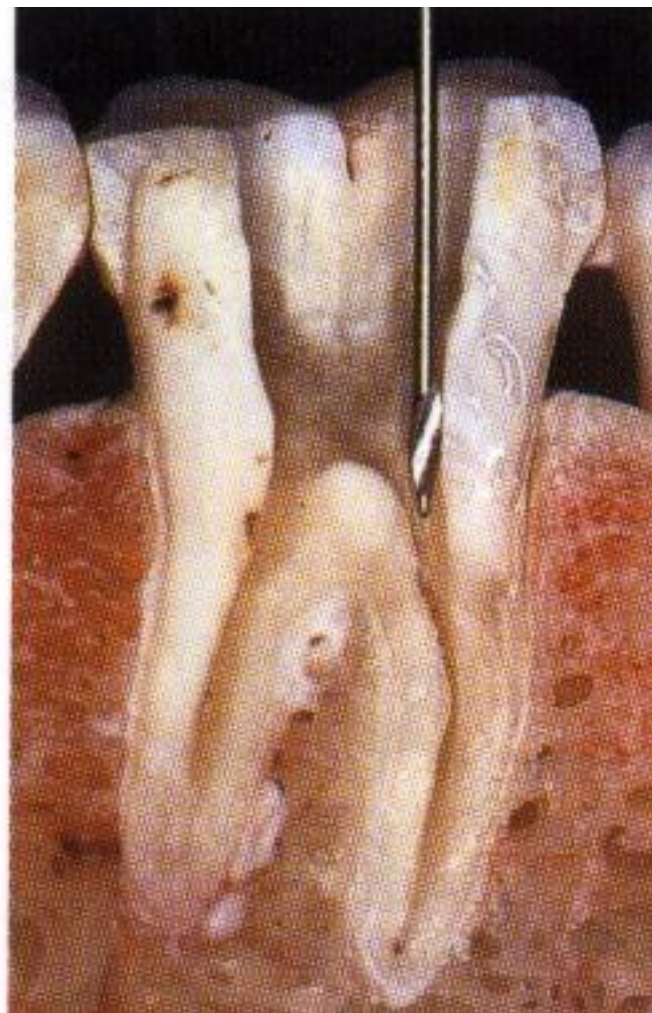
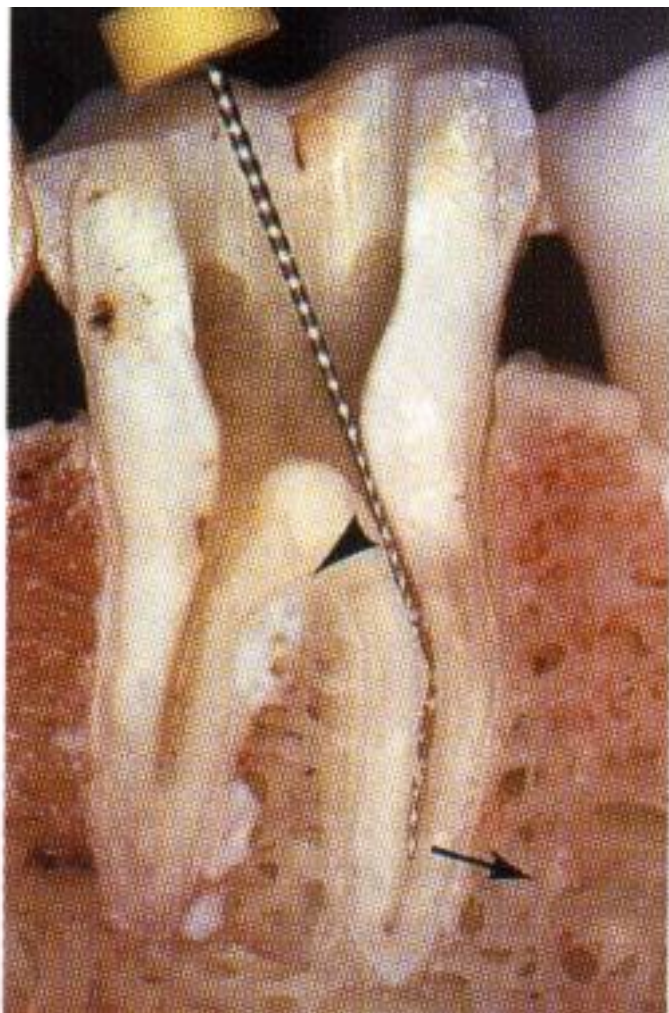
Phases of the endodontic treatment

- **Opening of root canals**
- **Initial flaring and removal of content of root canal**
- **WL (working length)**
- **Root canal shaping and cleaning (irrigation)**
- **Rekapitulation**
- **Drying**
- **Filling**
- **Radiogram**
- **Postendodontic treatment**

Access

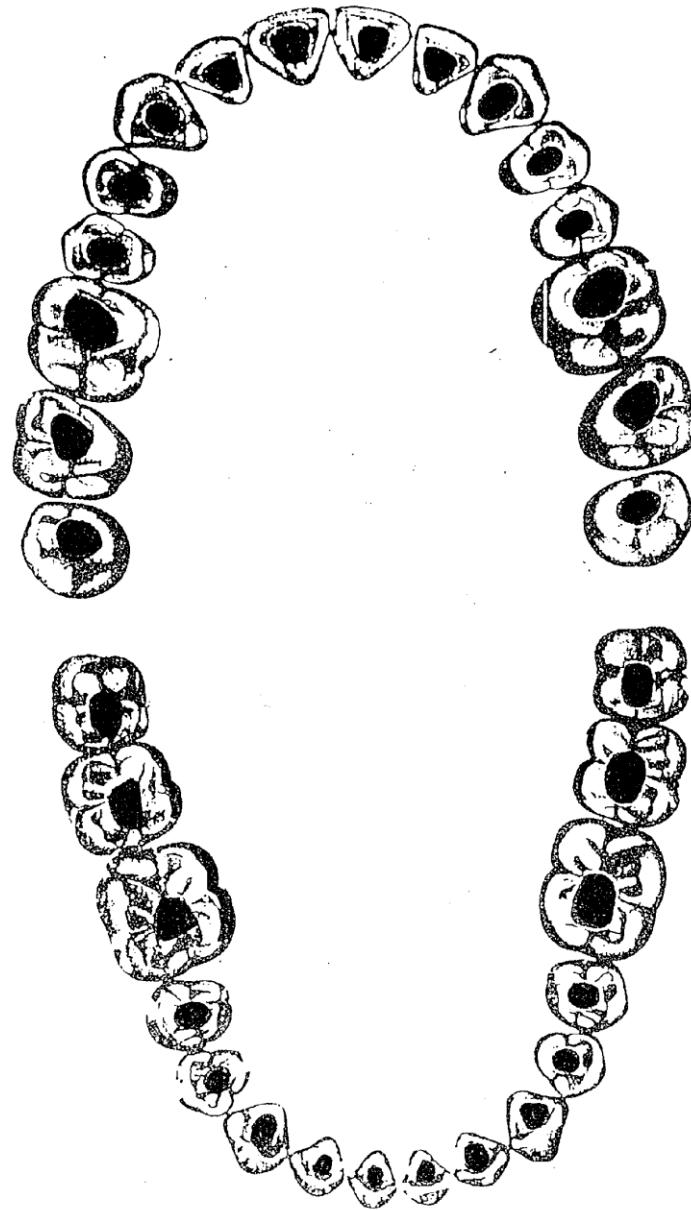


Rozšíření vchodu do kanálku

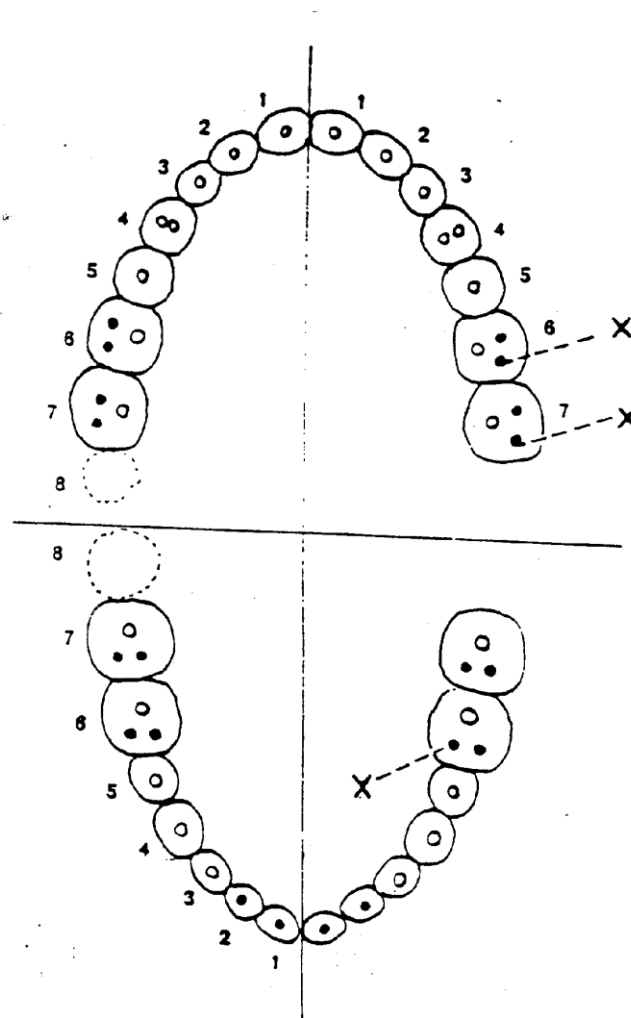


Shapes of endo cavities

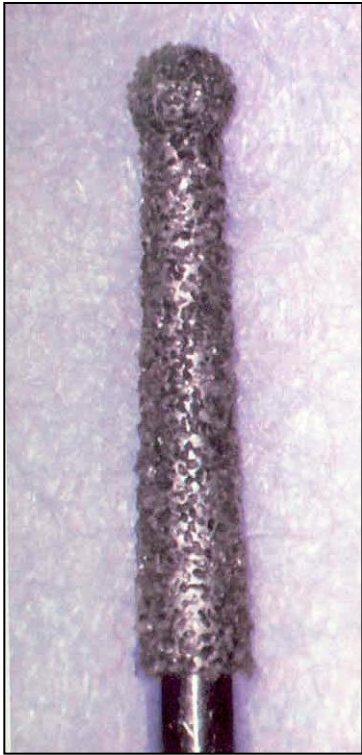
See special material on is



Number of root canals



Instruments



Dia trepan

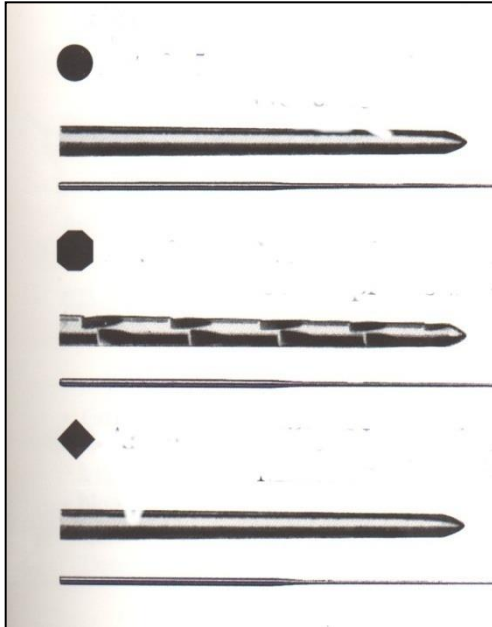


Dia balls

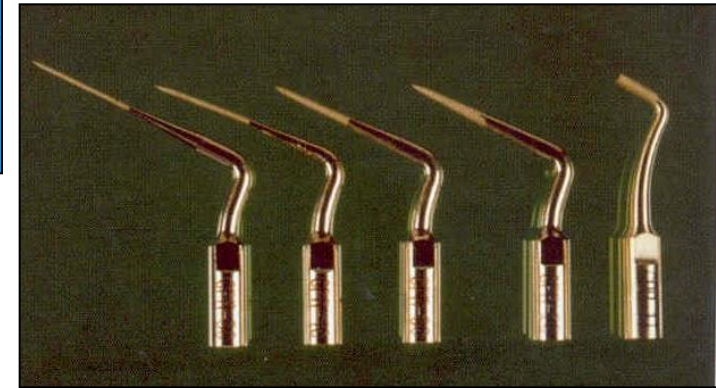


Ball burs

Nalezení a rozšíření vstupu do kořenových kanálků



↑
← Endodontické sondy,
microopenery



Uz špičky

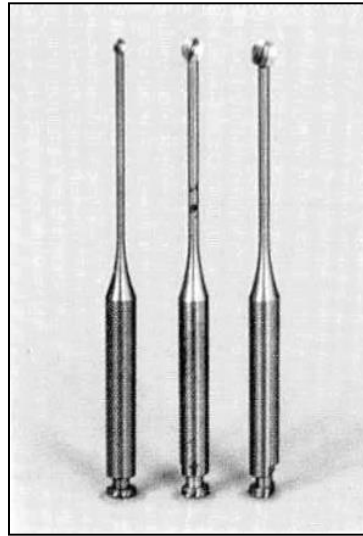


Barviva

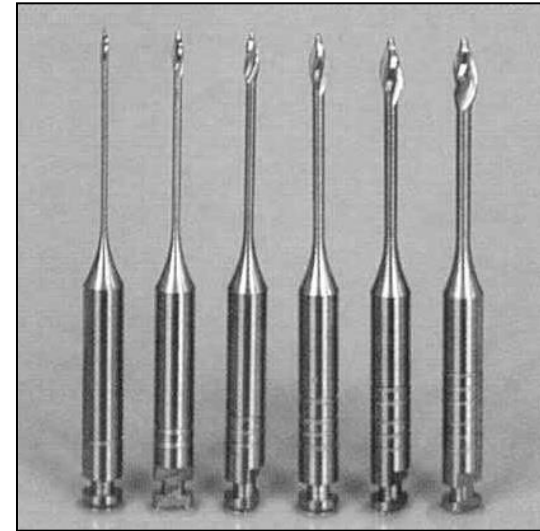
Opening of root canals



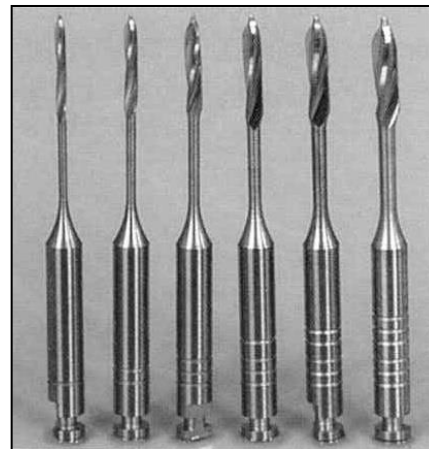
Ball burs



Miller's
burs



Gates Glidden's burs



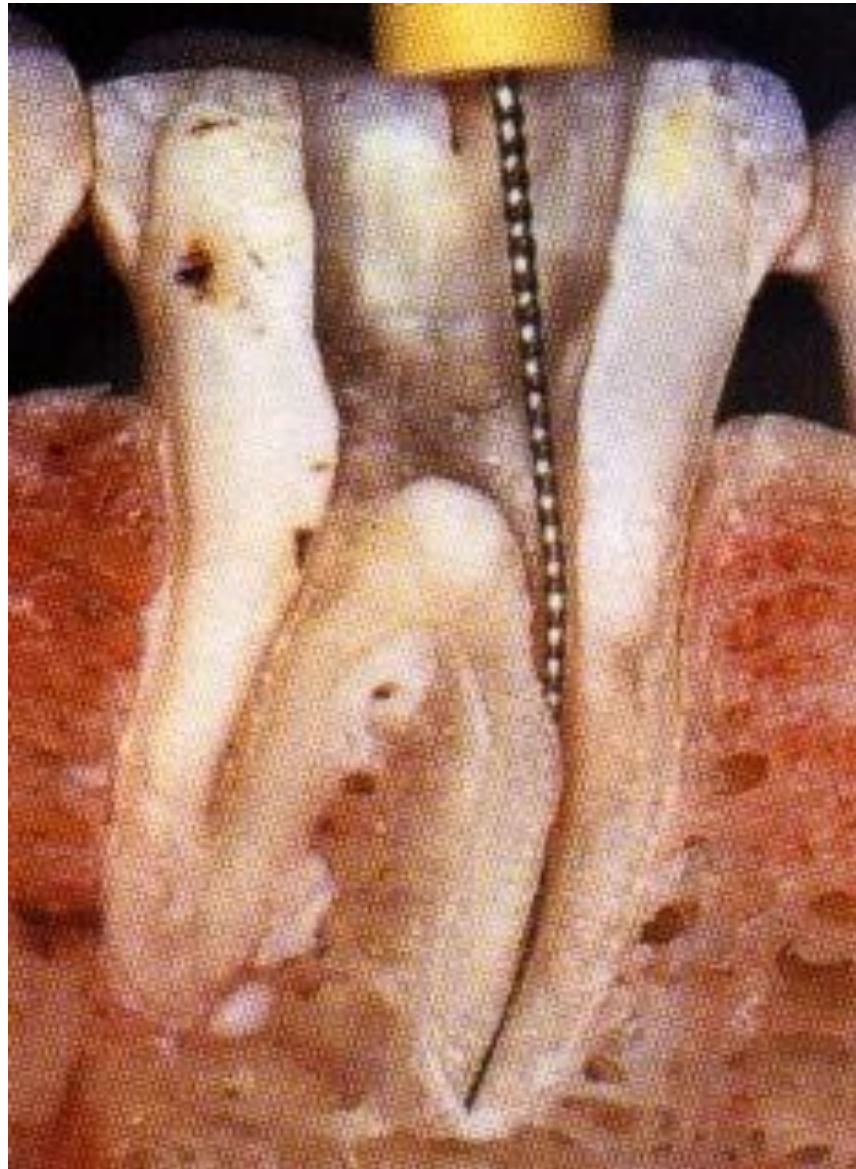
Peeso – Largo



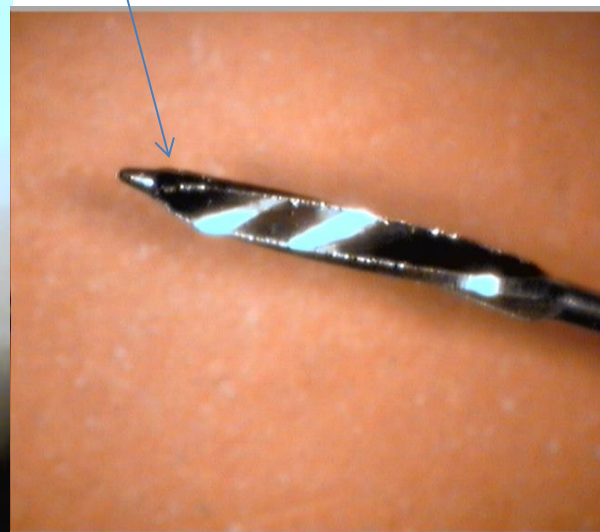
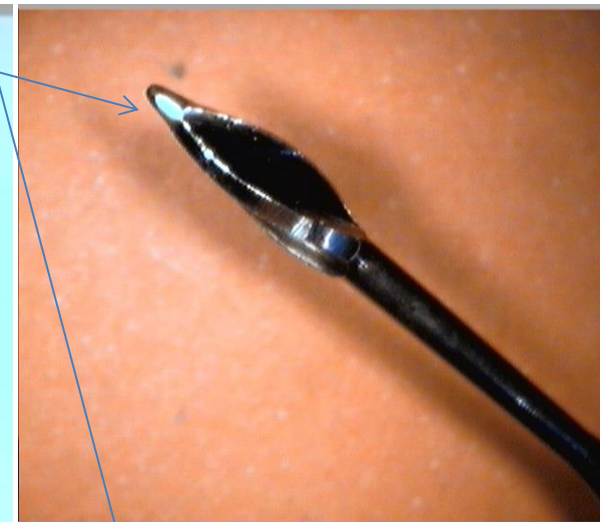
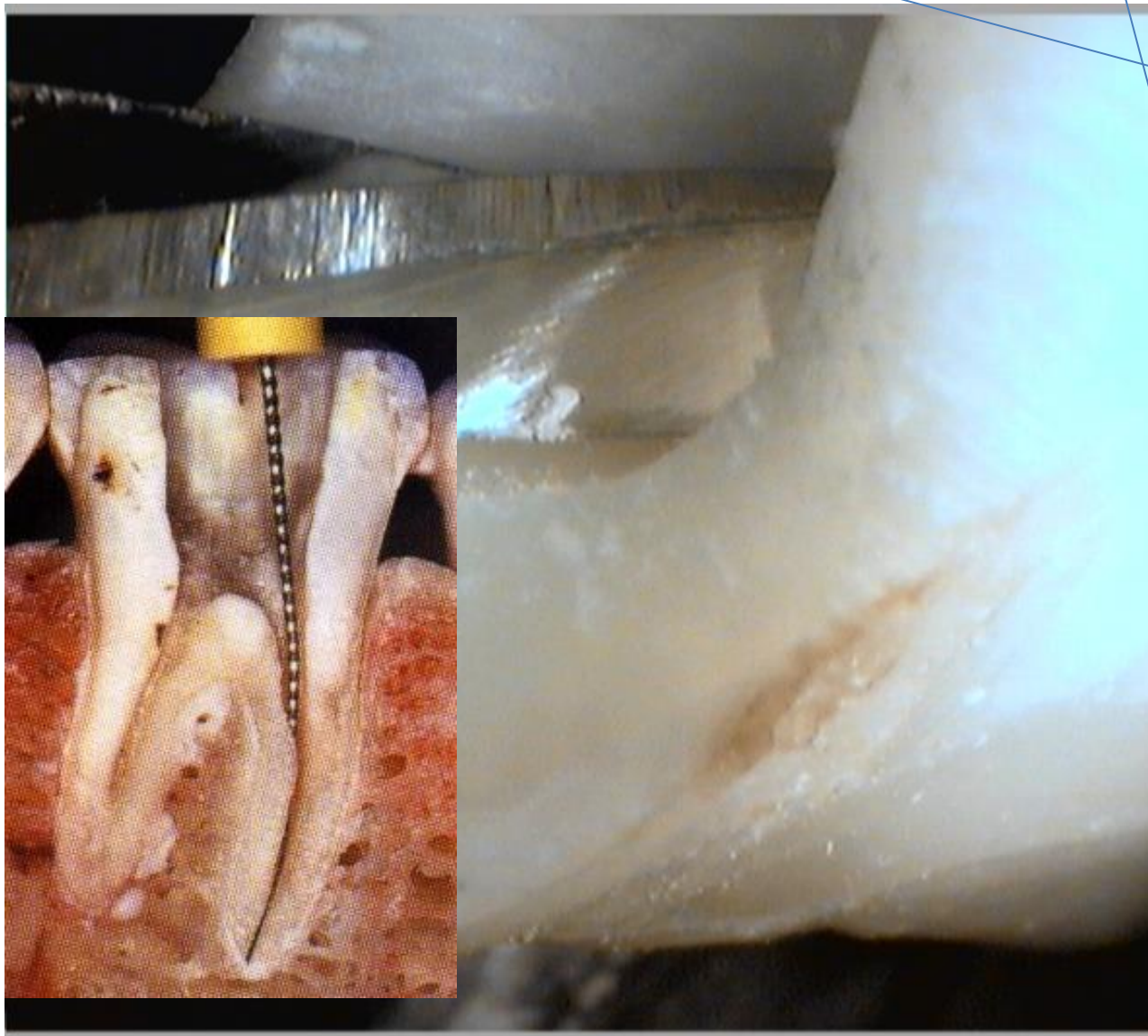
Access kits



Stav po trepanaci dřevné dutiny a rozšíření vchodu do kořenového kanálku



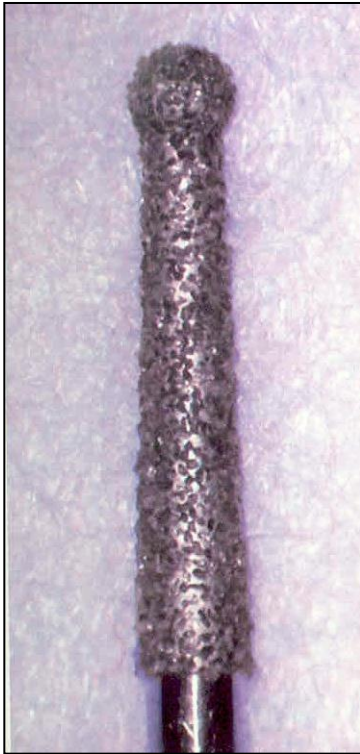
Vchodové rozšiřovače: Gates Gliddenův vrtáček, Peeso - Largo





The wall is weakend

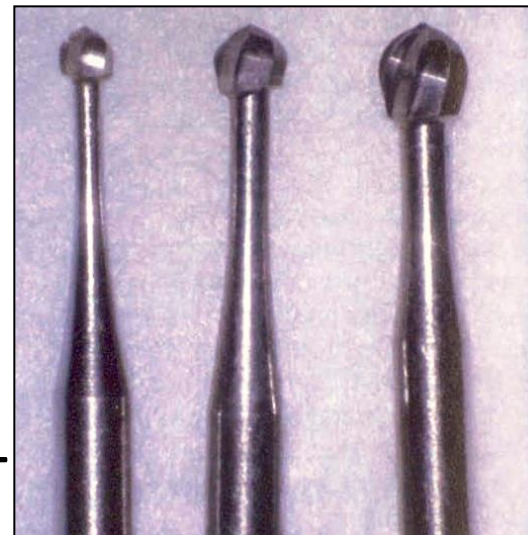
Opening of the pulp chamber Access



Dia trepan



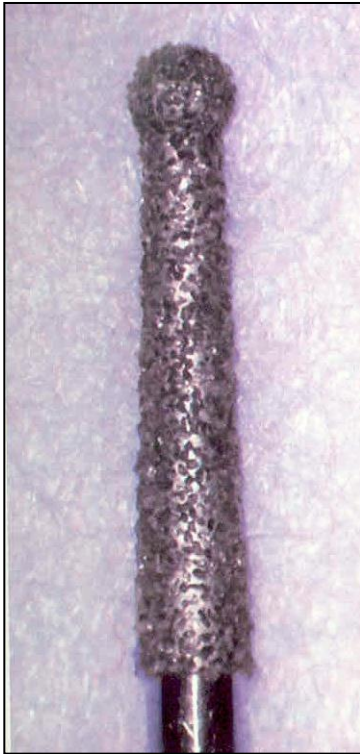
Dia round burs –
balls



Steel round burs



Preparation of the endodontic cavity



Dia trepan

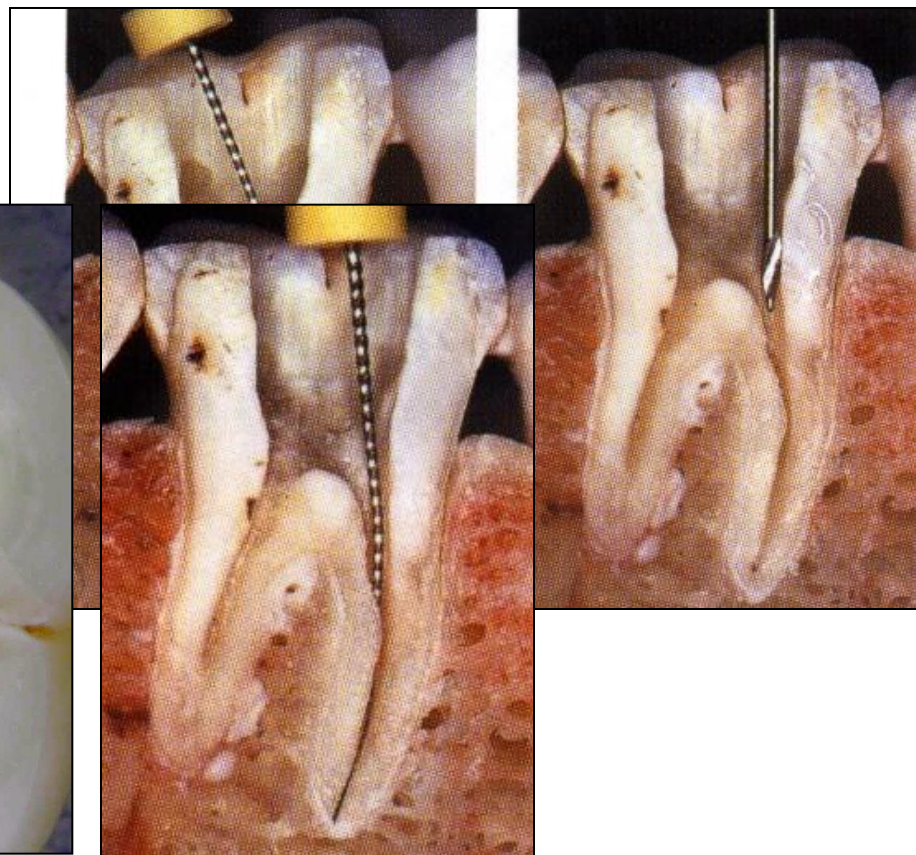
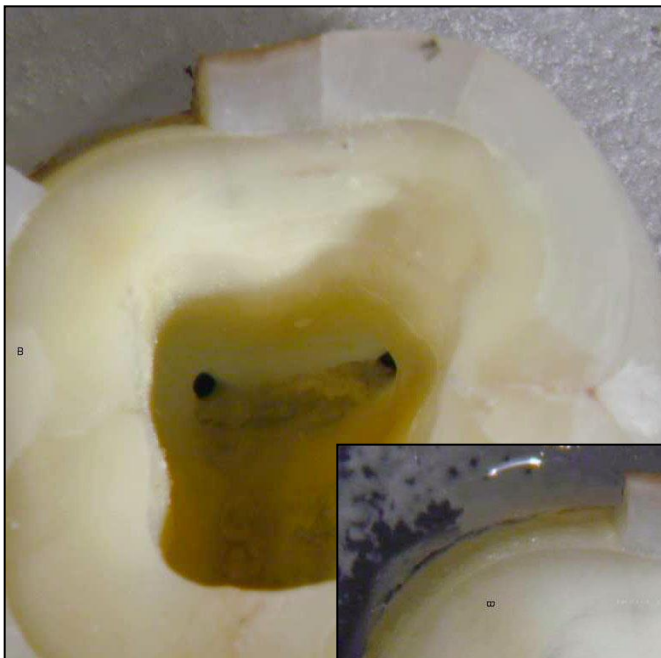


Safe ended tips
Batt's instruments

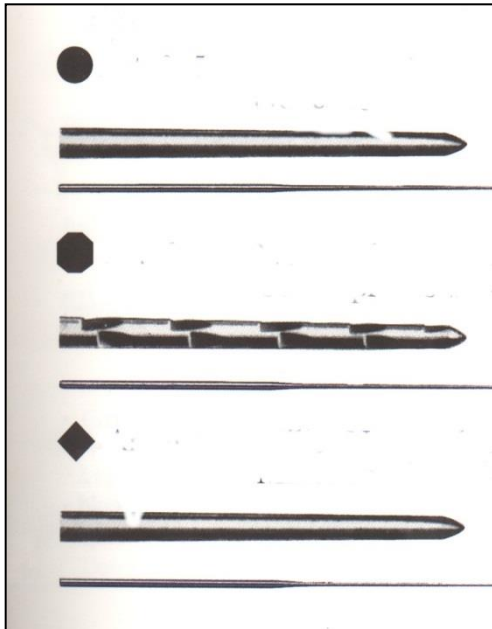


Fissur bur

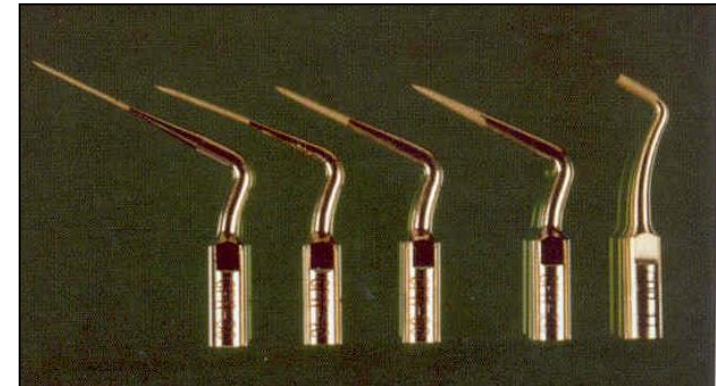
Finding of the root canal orifice



Finding and opening of rot canal orifices



Endodontic probes
Microopeners



Ultrasound tips

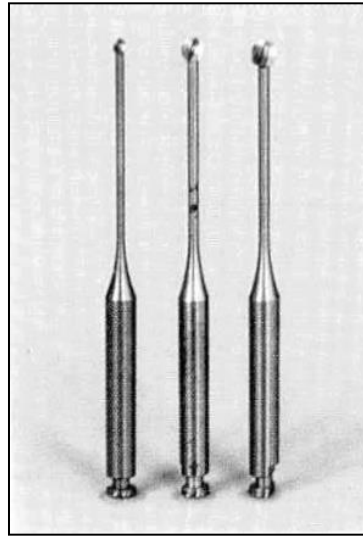


Dye

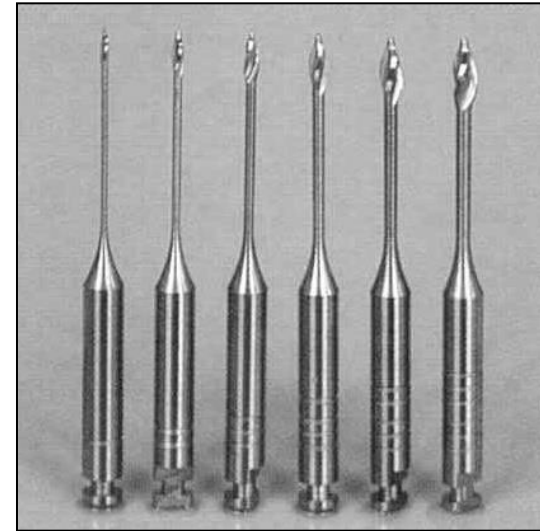
Finding and opening of root canal orifices



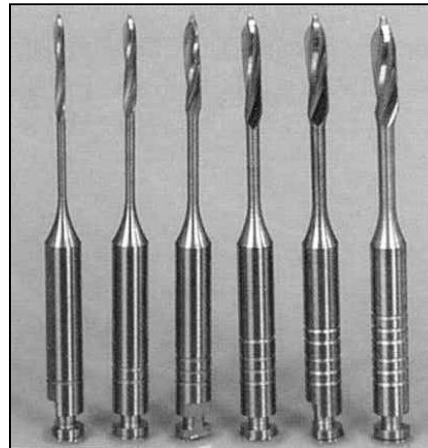
Rounded burs - balls



Miller's burs

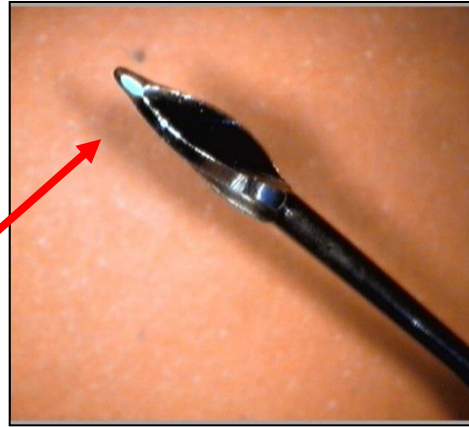


Gates Glidden's burs

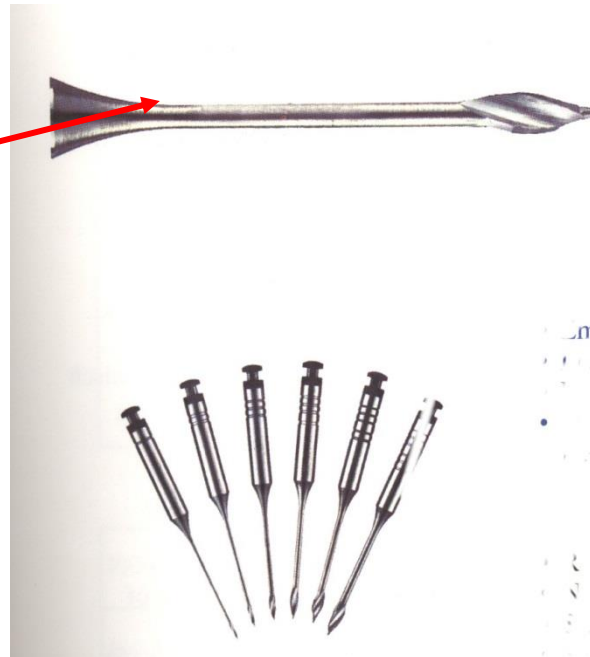


Peeso T9 Largo

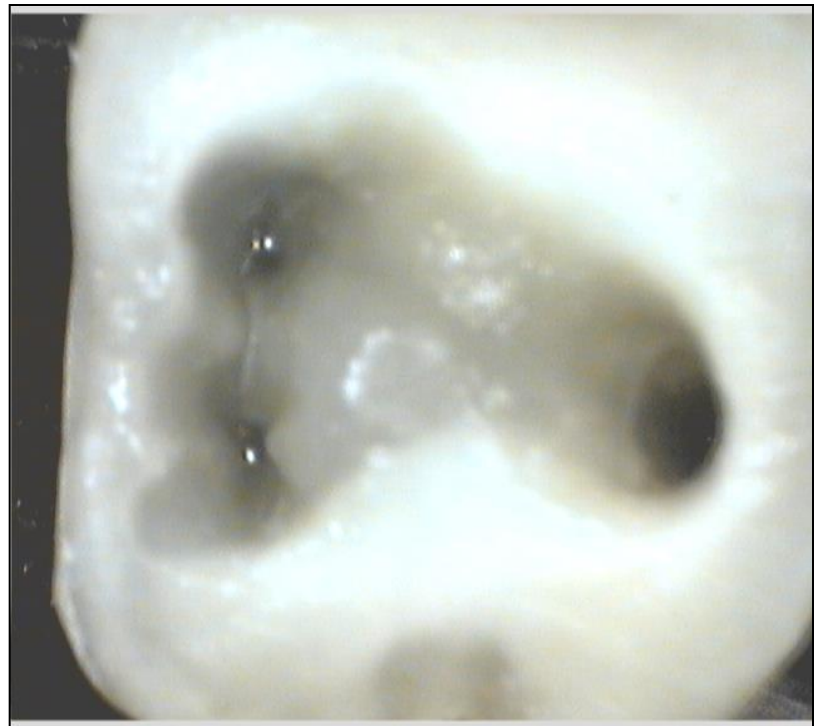




Gates – Glidden:
Blunt, non active tip



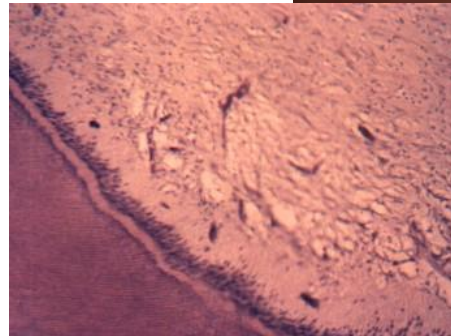
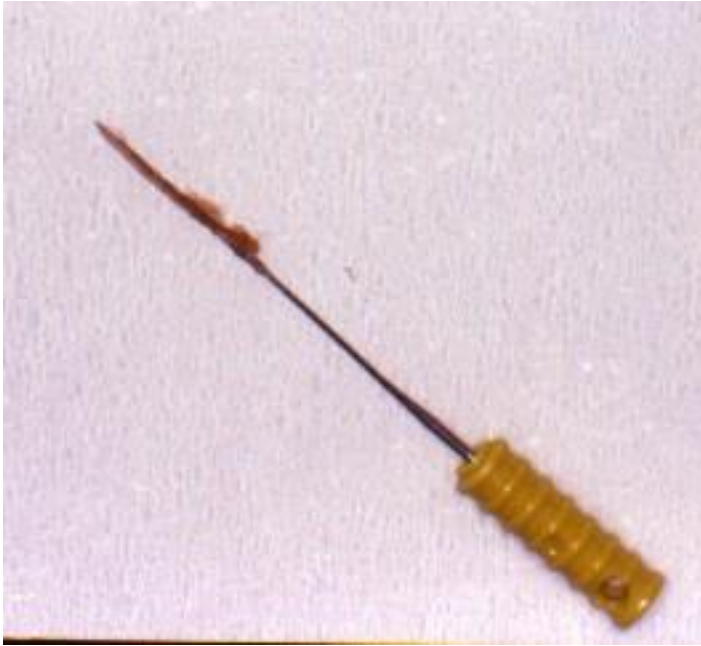
Programm point of breakage





Ultrasound

Pulpextractor



Soft wire
Prickles like harpune
Insertion
Rotation
Exstirpation

Canal shaping

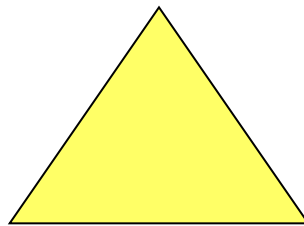
- Reamers (penetration)
- Files (shaping)

Reamer

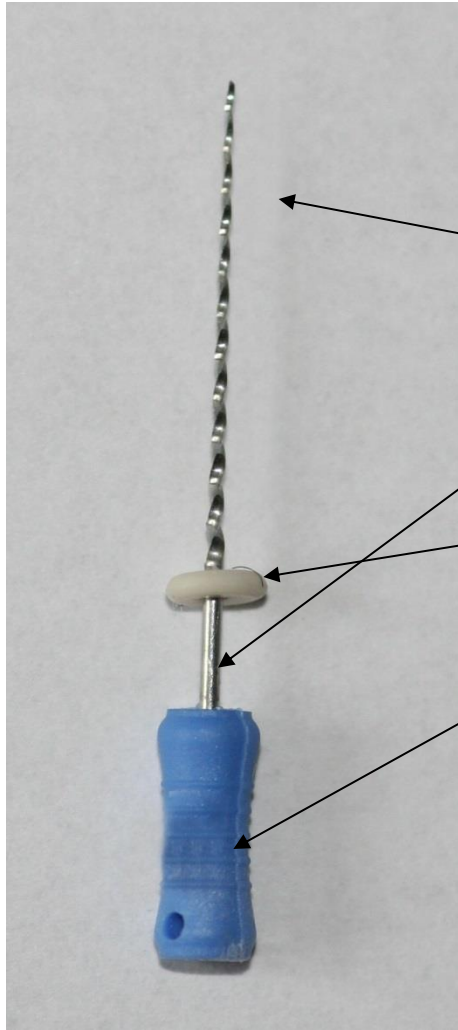
K -reamer

Triangl or square wire spun

Symbol



Reamer

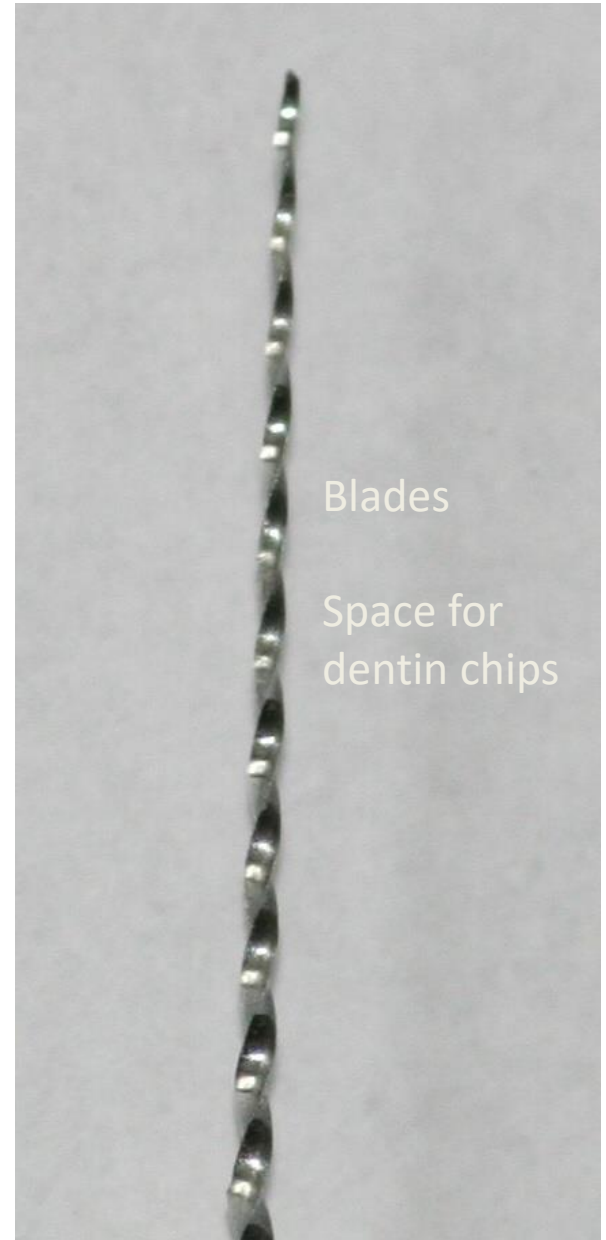


Bladed part

Shank

Stopper

Grip



Blades

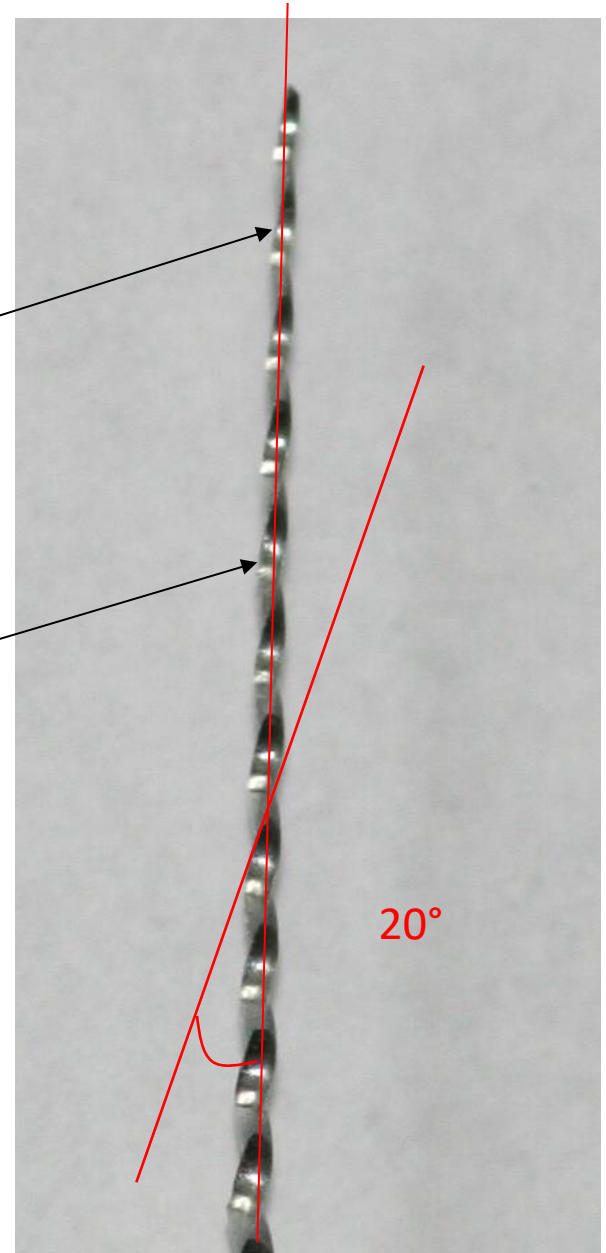
Space for
dentin chips

Reamer

Blades

Space for dentin chips

Rotation – reaming action - penetration



Reamer

Rotation (clockwise) – penetration

**Application of plastic material
(counterclockwise)**

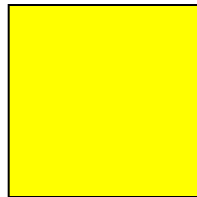
Files

- 1. K-file**
- 2. K-flexofile, flexicut, flex-R**
- 3. K-flex**
- 4. H-file, S-file**

K file

Wire triangl or square

Symbol is always square

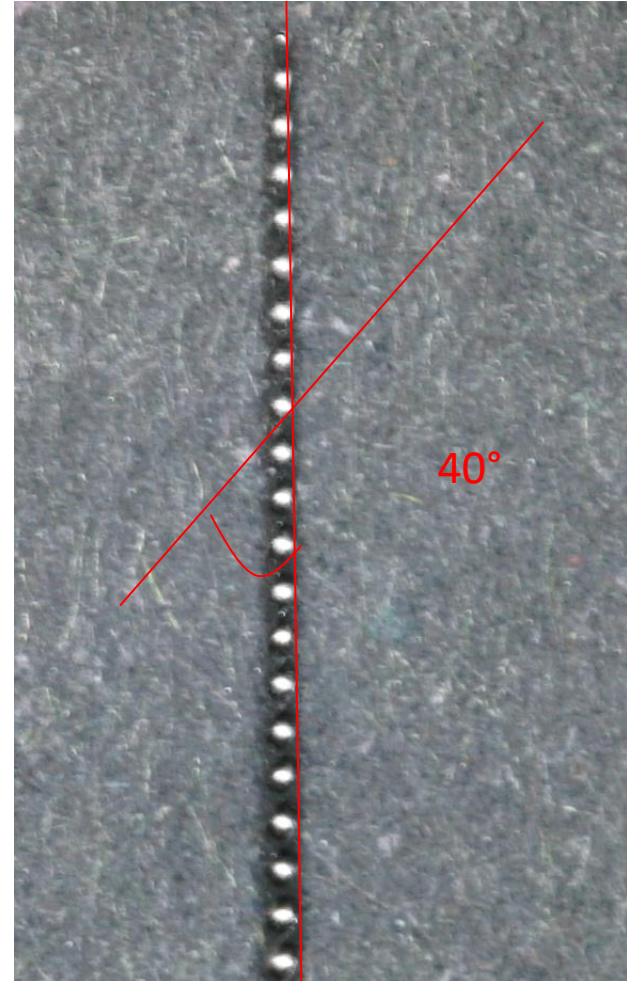


K-file

Filing

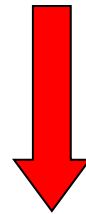
Also rotation

45° – 90°

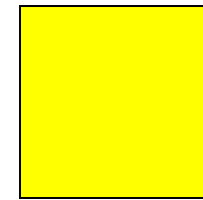


K-flexofile, flexicut, flex-R

- Triangle wire always



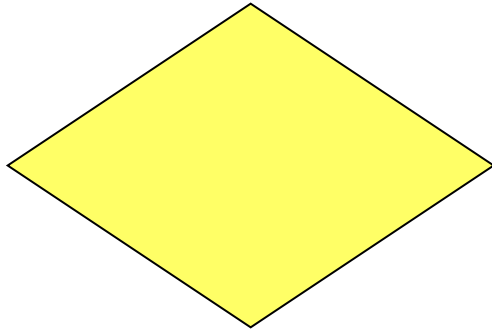
Flexibility



K- flexofile a flex – R file: non cutting tip and first blades are blunt

Like K-file

K- flex



Rhombus

Two blades in action

Enough space for dentin chips

Flexibility, efficacy

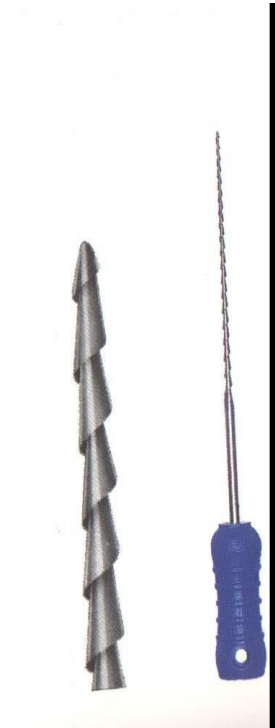
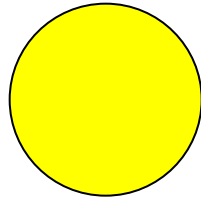
K-file a reamer: rozdíl



H-file

= Hedstroem file

Ring

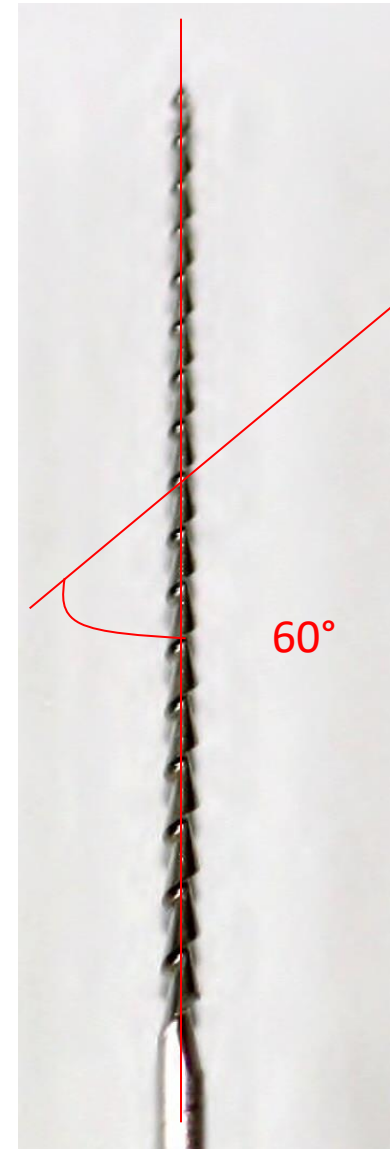
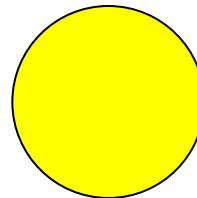


H- file

No rotation!!

Pull motion only!!

Risk of breakage in small sizes



ISO

- Diameter of the tip
- Length of the cutting part
- Taper

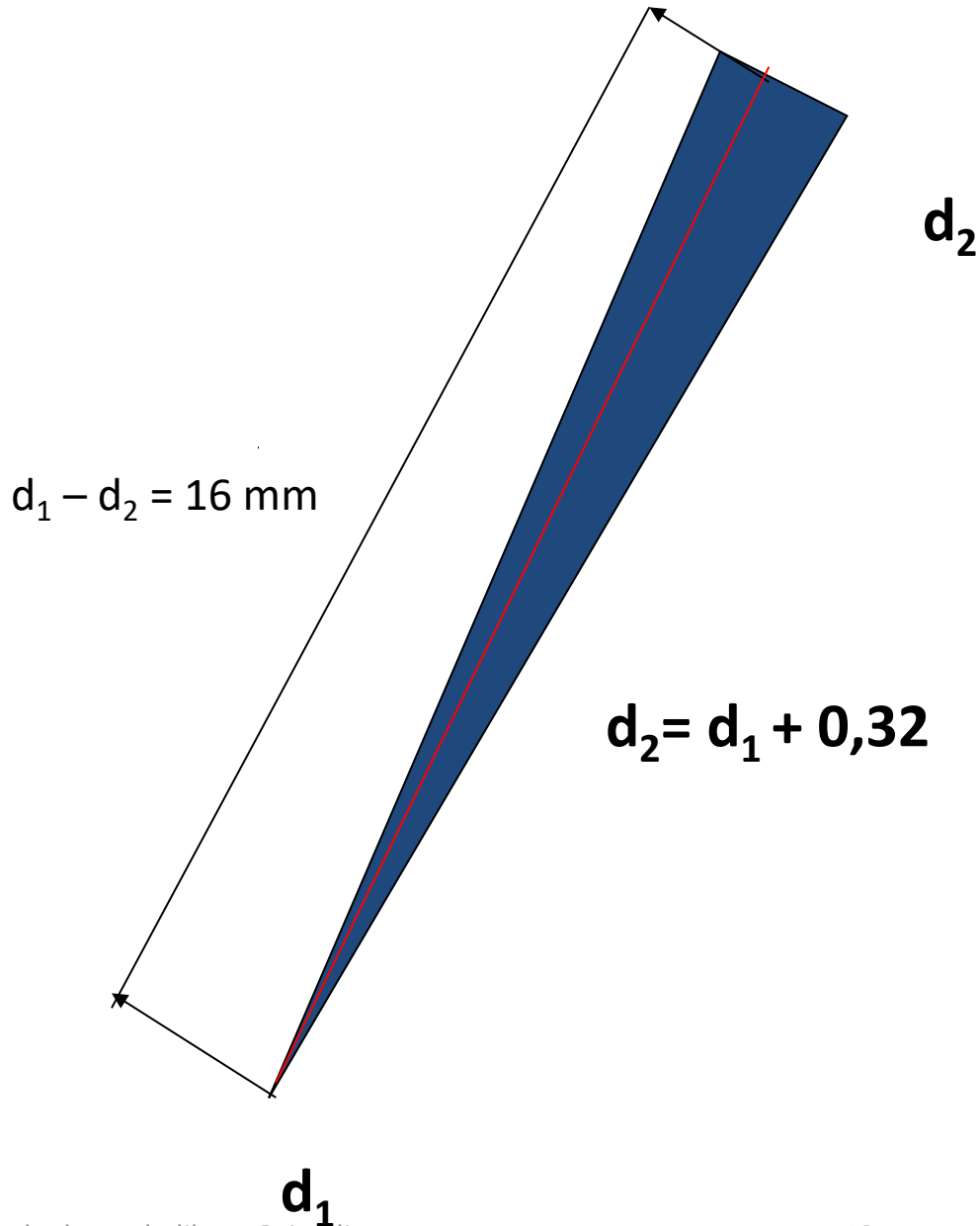


ISO standard

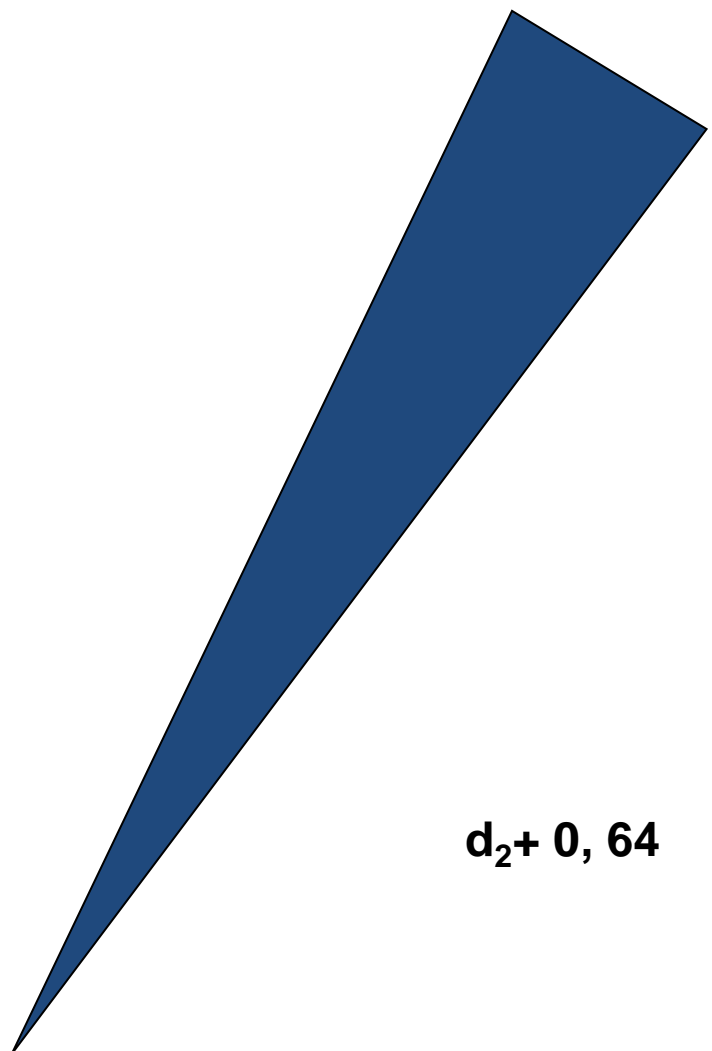
06	
08	
10	
15	45
20	50
25	55
30	60
35	70
40	80

Size – diameter at the tip

Taper 2%



0,02 mm na 1mm



Konus 4%

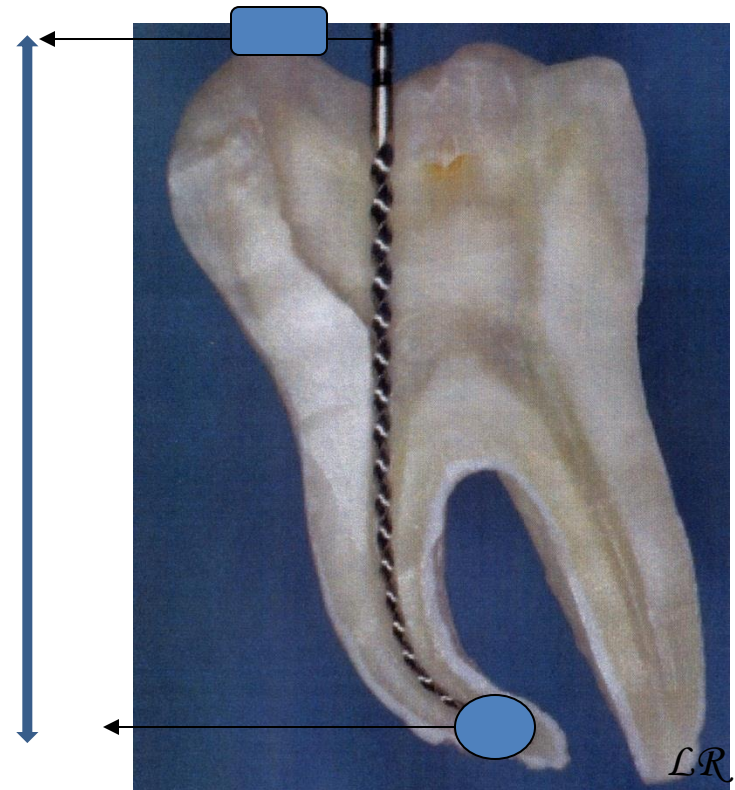
0,04mm na 1 mm

Initial flaring



Working length

- Distance between the referential point and apical constriction
- Radiographically
- Apexlocators
- Combination



Why apical constriction

- Small apical communication
- Minimal risk of damage of periodontium
- Prevention of overfilling
- Prevention of extrusion of infection
- Good decontamination
- Good condition for root canal filling

Radiogram

X-ray with inserted root canal instrument

Safe length: average length of teeth reduced for
2 – 3mm

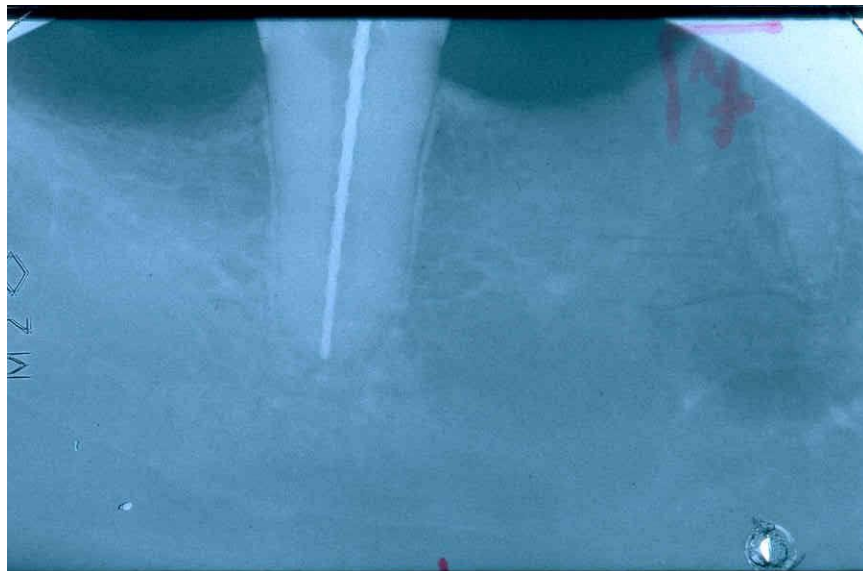
Tooth with clinical crown

Procedure

- Instrument ISO 15 introduced into the root canal, stop at the referential point
- Estimation of location of apical constriction (1 – 1,5 mm distance from x-ray apex.

If difference in the radiogram more than 23 mm
- repeat

If 2 mm or less – add to the safe length



Safe length

- Maxilla:

I1 20

I2 18

C22-24

P20

M 18 mkk, 20 P

Safe length

- Mandible

I 18

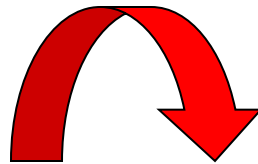
C20 -22

P18

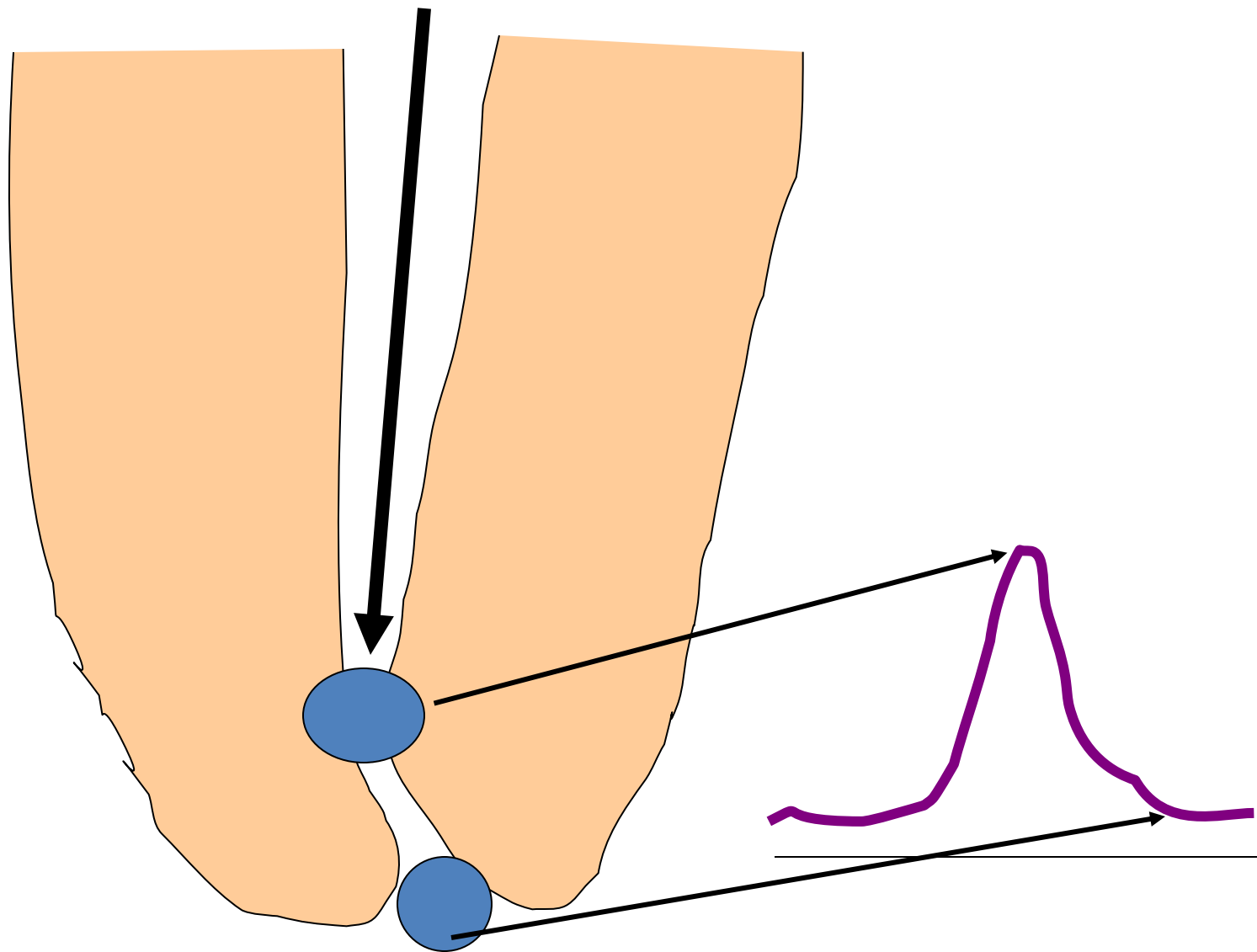
M18

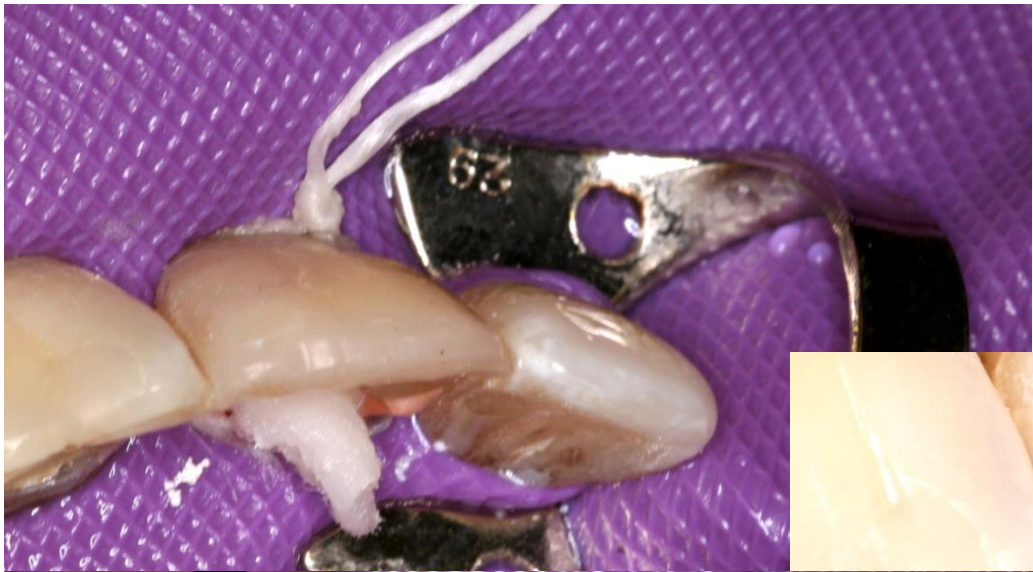
Endometry, odontometry

- Endometry



edevices based on measurement of electrical resistance

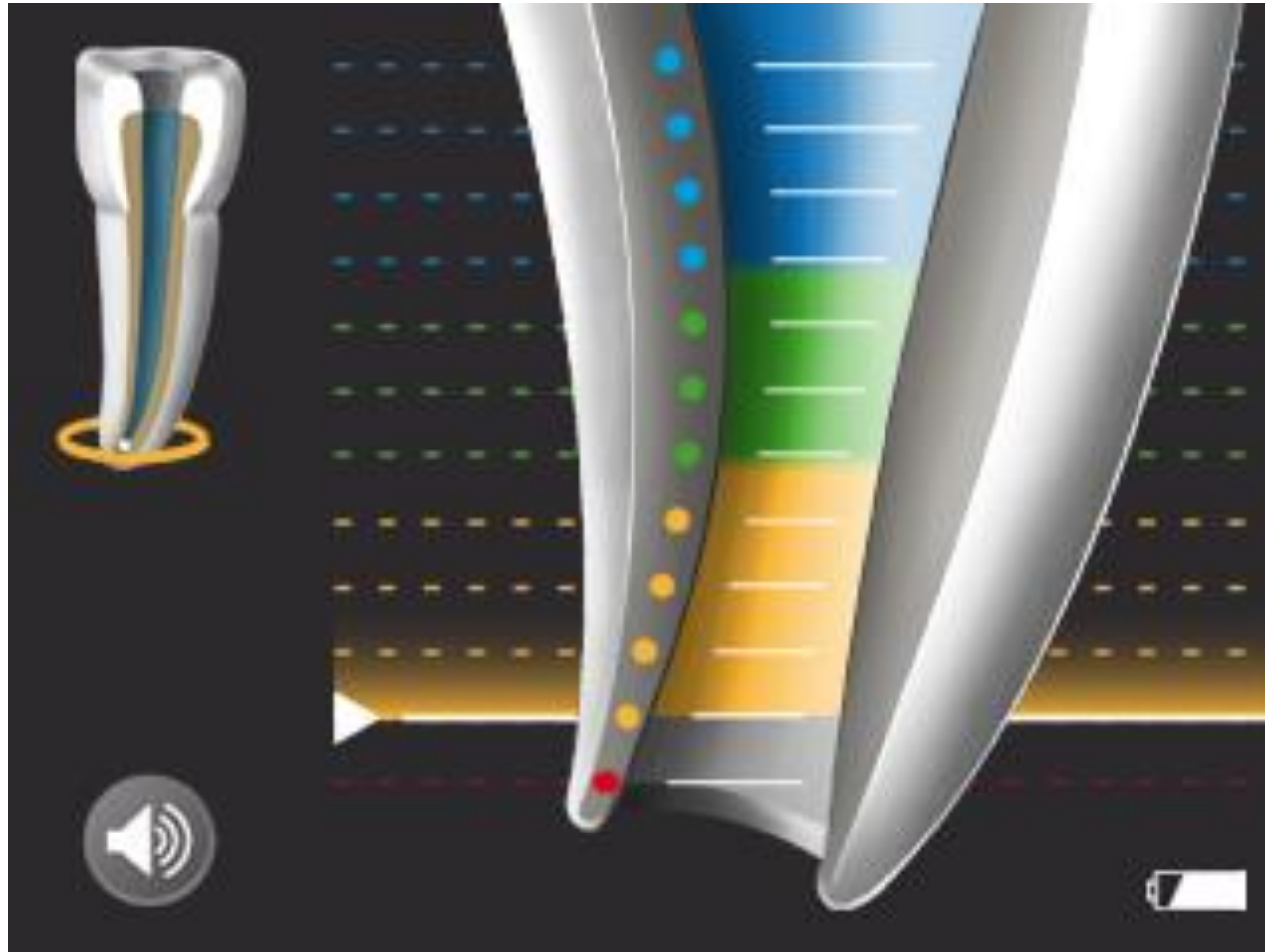




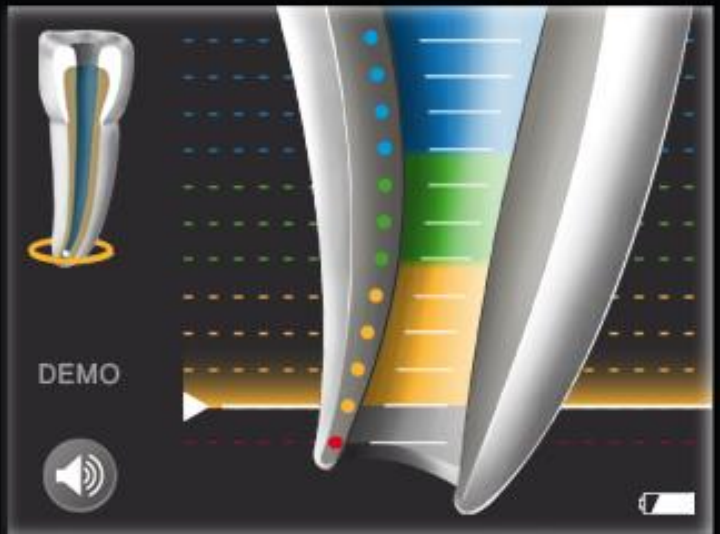
RAYPEX® 6



Měření – apikální zoom



VDW®



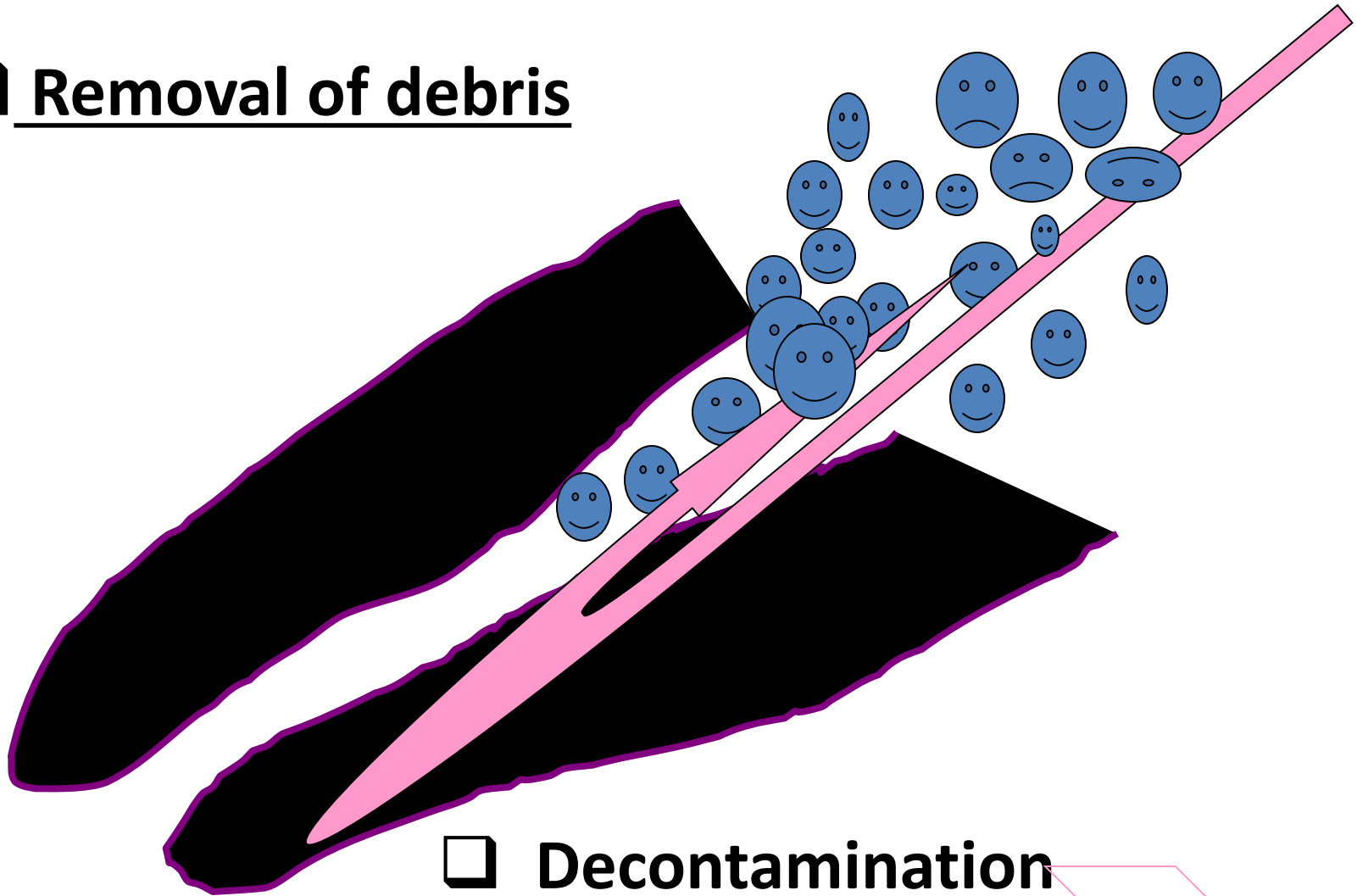
DEMO



RAYPEX® 6

Irrigation

Removal of debris



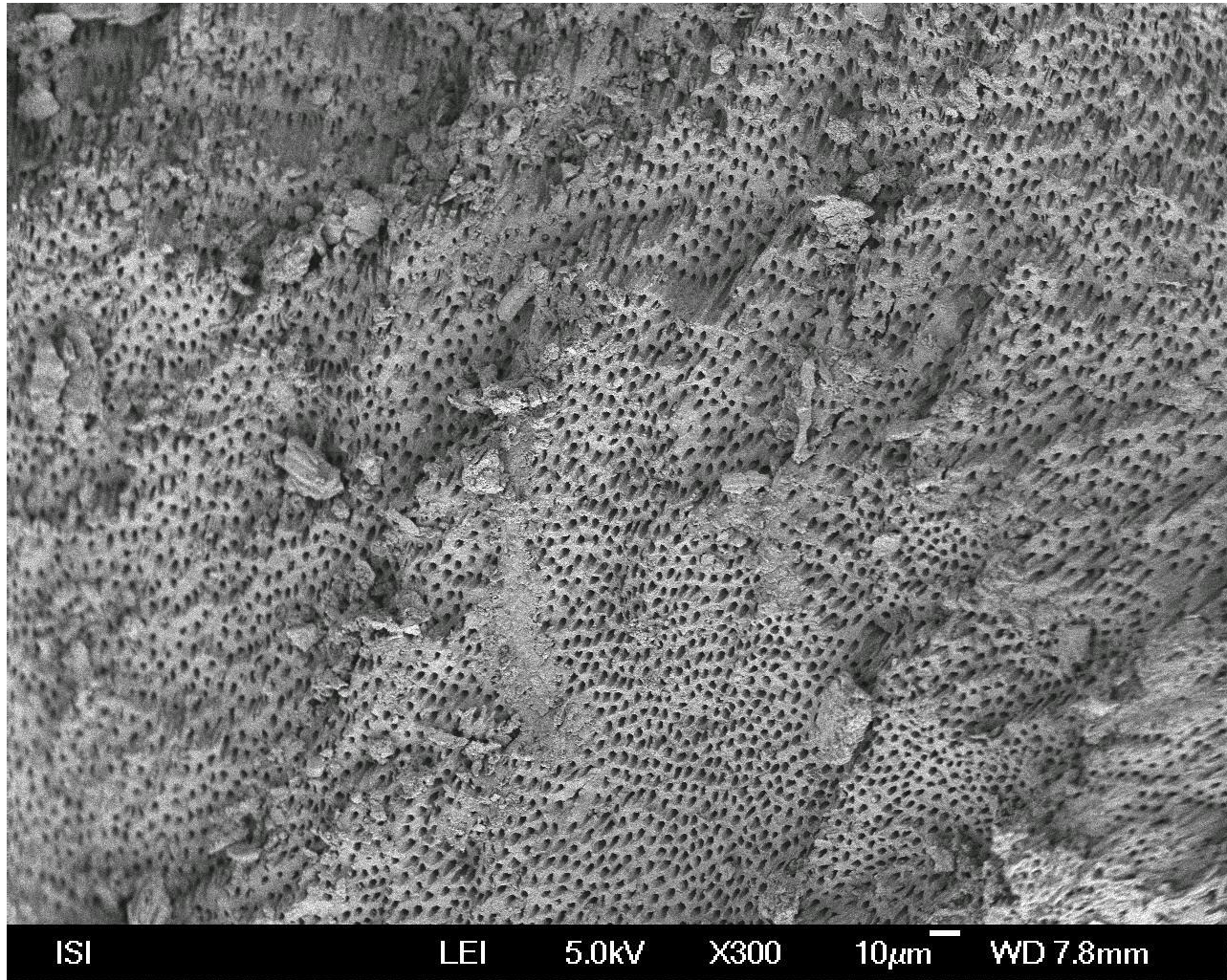
Decontamination



Irrigants

- **Sodium hypochlorite (1,5 – 5,5%)**
- **Chlorhexidin (0,12% - 0,2%)**
- **EDTA – etyléndiaminotetraacetic acid 17%**





ISI

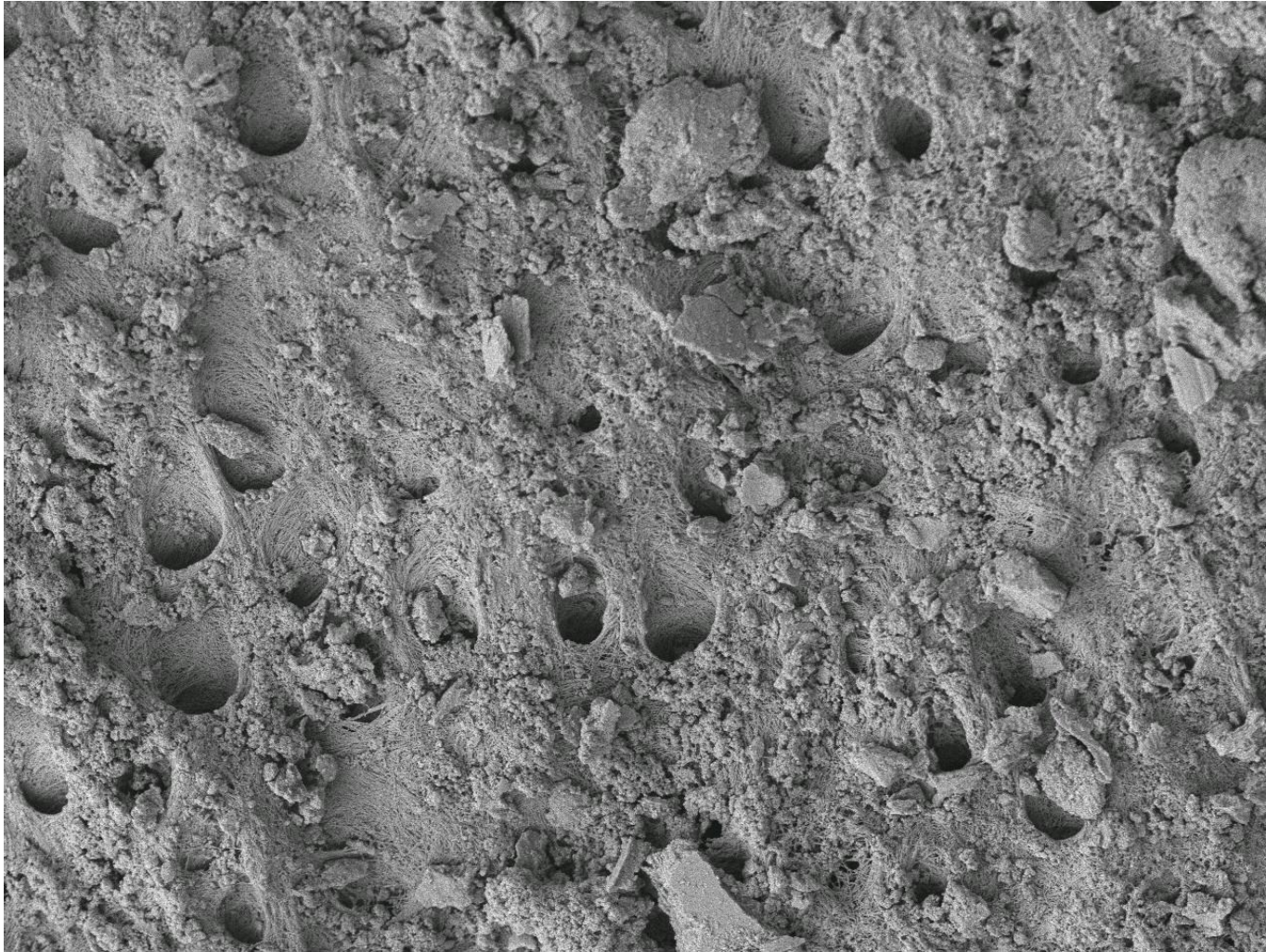
LEI

5.0kV

X300

10µm

WD 7.8mm



ISI

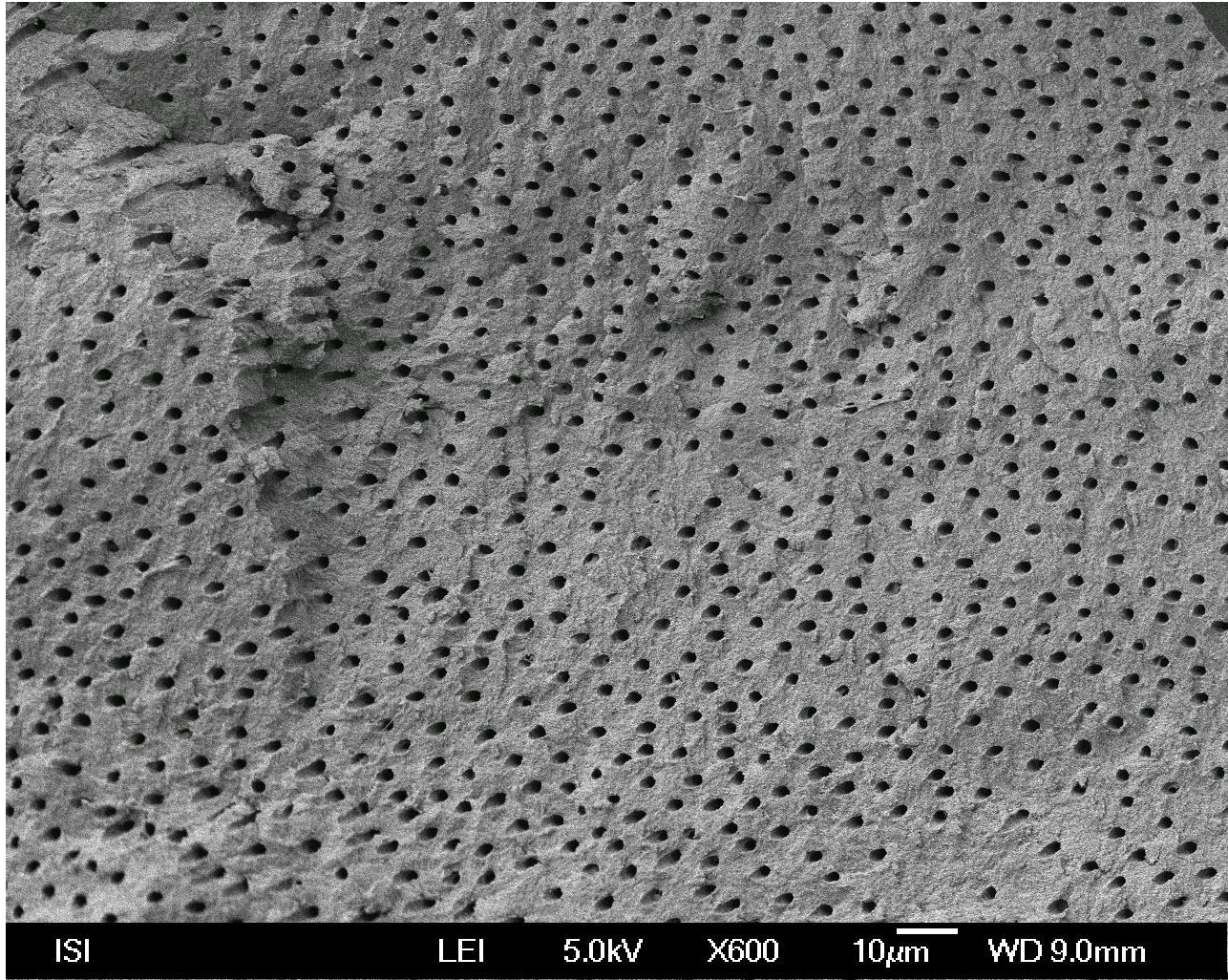
LEI

5.0kV

X2,000

10 μ m

WD 8.1mm



Irrigants

- Sodiumhypochlorite

2 – 6%

- Oxidation a chloration
- Dissolving efect
- Bad smell, irritant.

Syringe and cannula

- B
- N



Activation of irrigation

- Increased effectivity

Vibration

Increasing of temperature

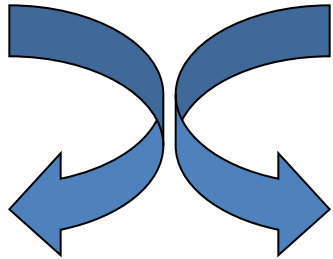
Decomposition of irrigants - dissociation





Shaping techniques

- Rotation – 45°

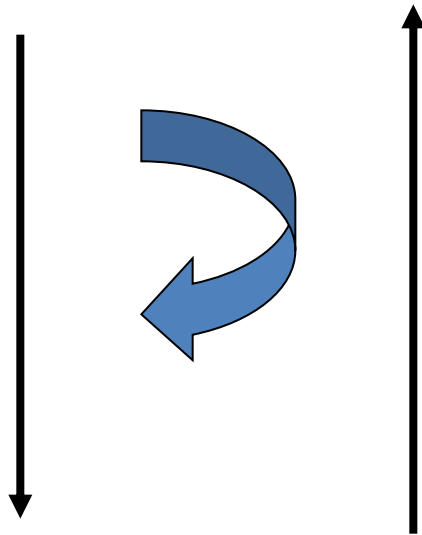


K – reamer

K- file

Shaping techniques

- Rotace 45° pressure and pull motion



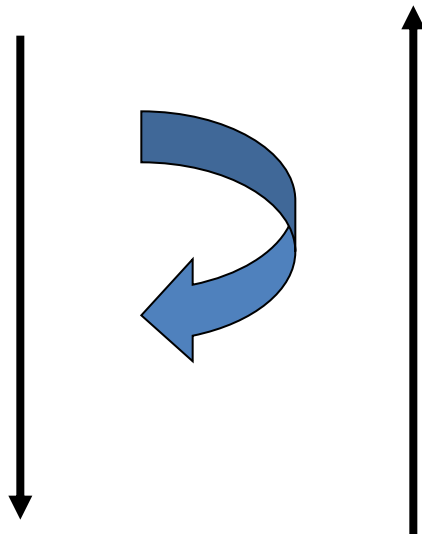
K – reamer

K- file

Risk of ledging
Zip, elbow effect
Via falsa

Shaping techniques

- Filing



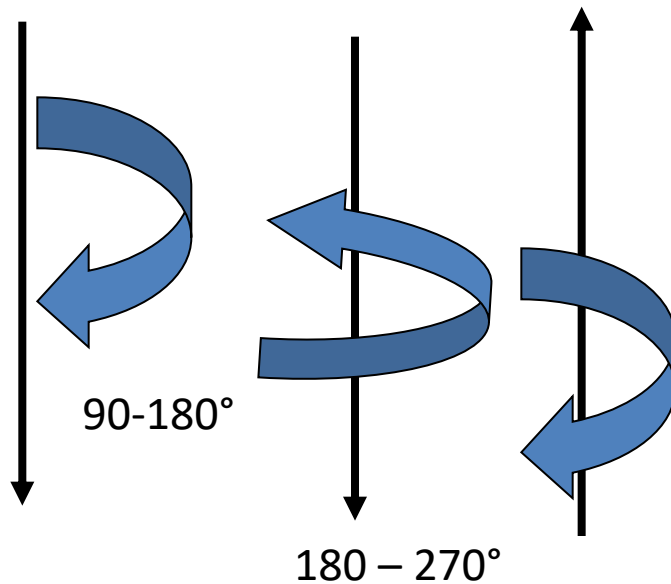
H- file

K – file

Risk of periapical infection
Risk of plug

Shaping techniques

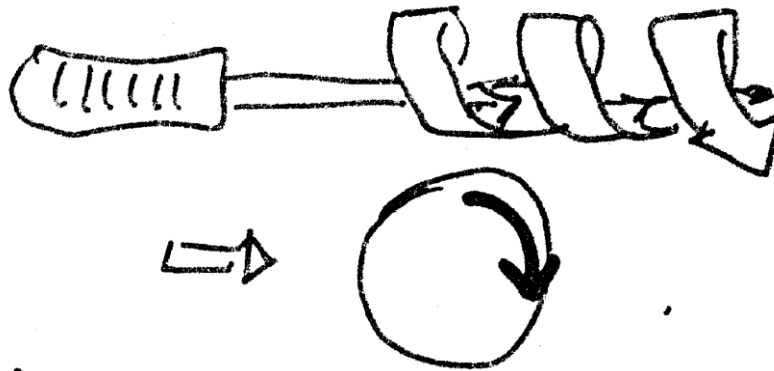
- Balanced force



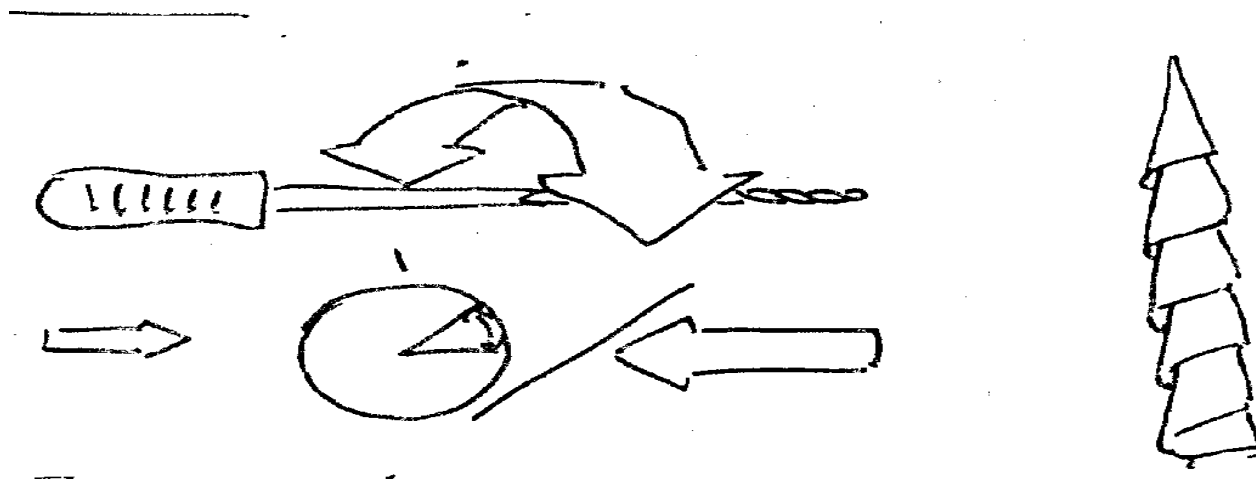
K- flexofile

K – file (?)

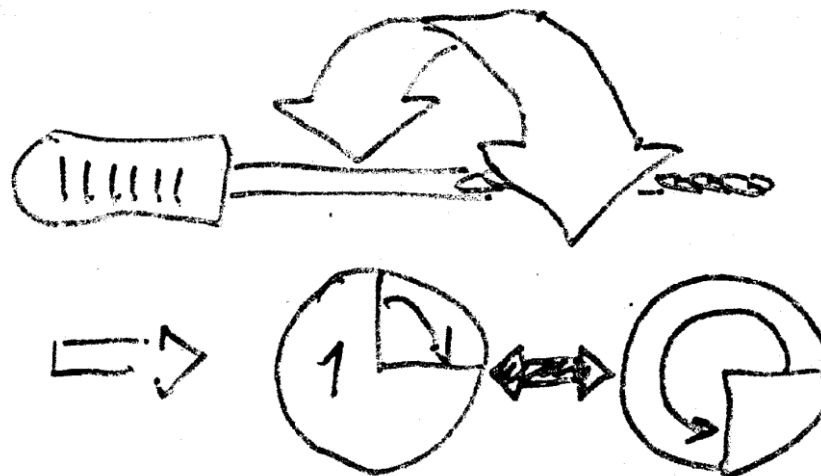
Reaming



Filing



Balance forced technique



Methods of shaping

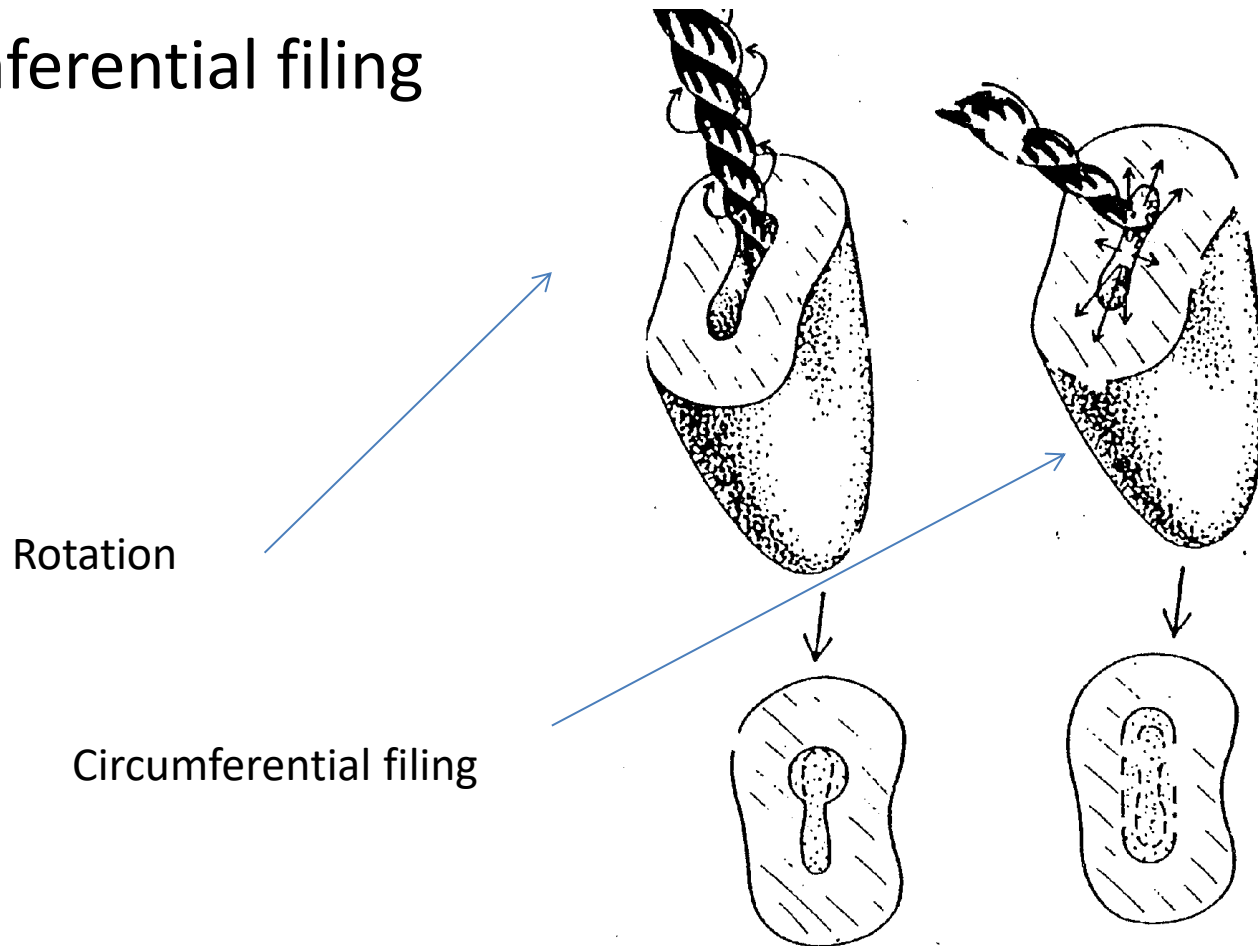
- Rotation and filing combined

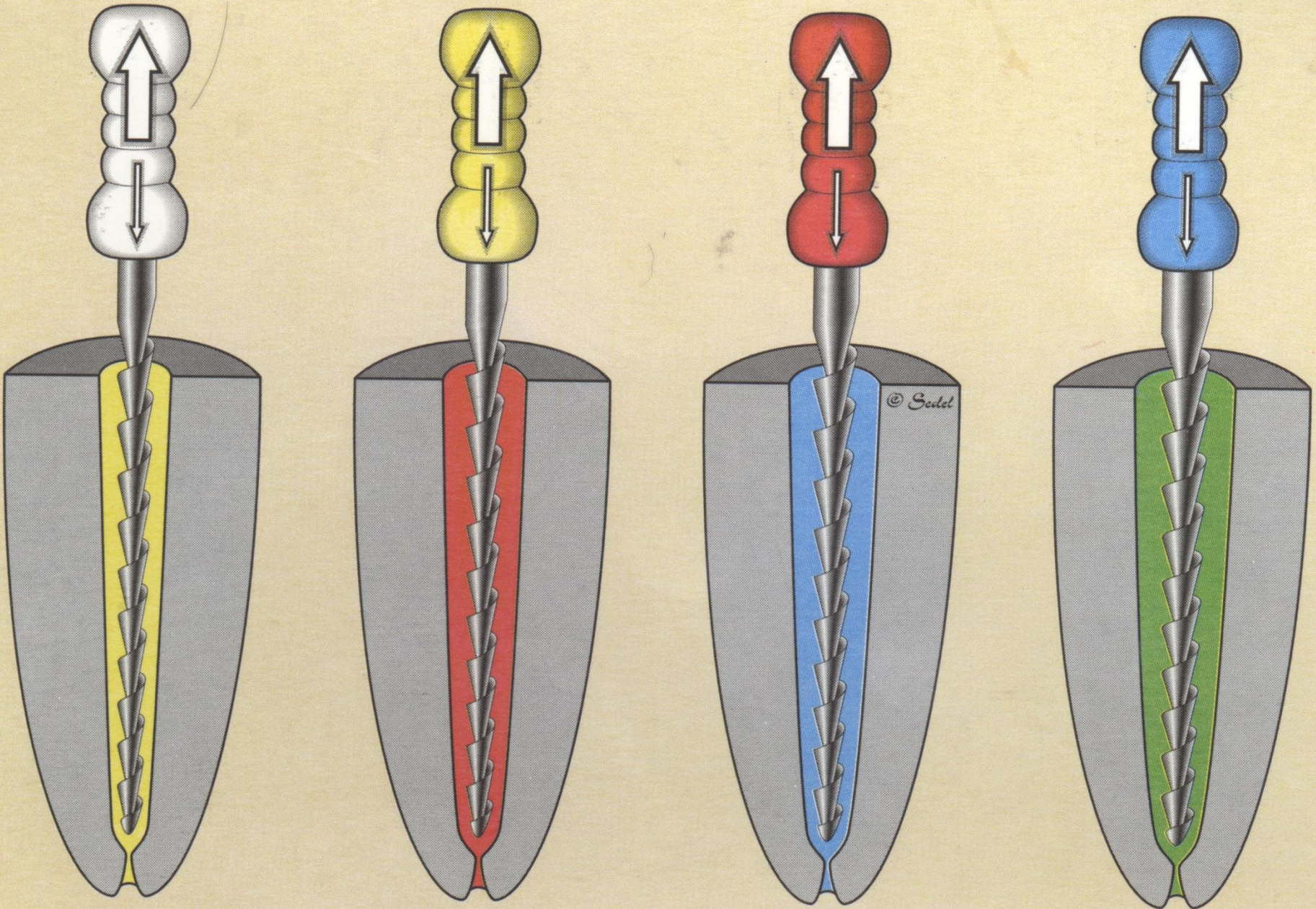
K - reamer

H- file

Methods of shaping

- Circumferential filing





Methods of shaping

- Combination of rotation and filing

Start with rotation

Finishing with filing

Suitable for straight root canals

Methods of shaping

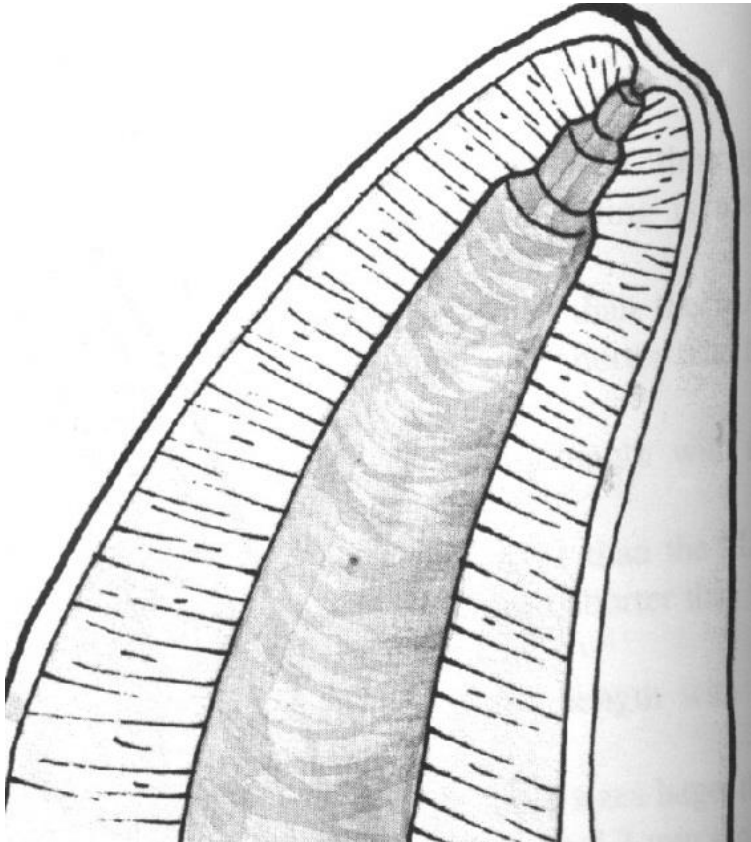
- Step back method

Increasing size with decreasing length.

Insertion of root canal instrument – WL

Next – 1 mm shorter

...



Taper
Final flaring with
the smallest instrument

H- File nebo K - Flexofile.

Method modified double flared

- I. Opening of root canal

- Coronal third

- II. Apical preparation

Cathetrization, measurement, shaping till ISO 30 – 35
balanced force. Master file – MAF (till WL)

- III. Step back

- Final flaring (MAF)