Endodontic treatment – root canal shaping

Phases of the endodontic treatment

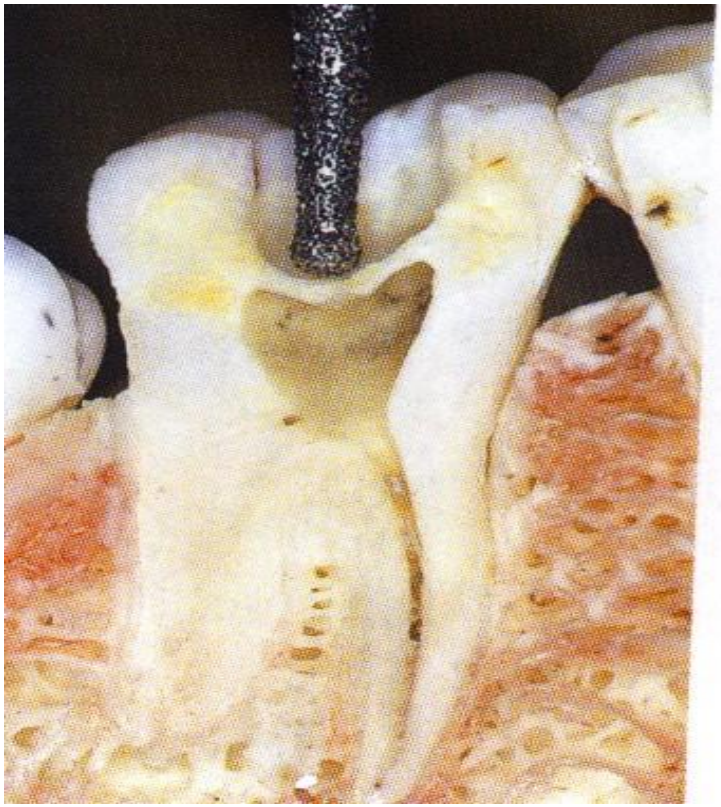
- **Investigation, diagnostic radiogram, consideration (local, regional, systemic factors)**
- **Removal of old fillings, carious dentin, temporary restoration - contours of treated tooth.**
- **Dry operating field**

- **Preparation of the access (endodontic cavity)**

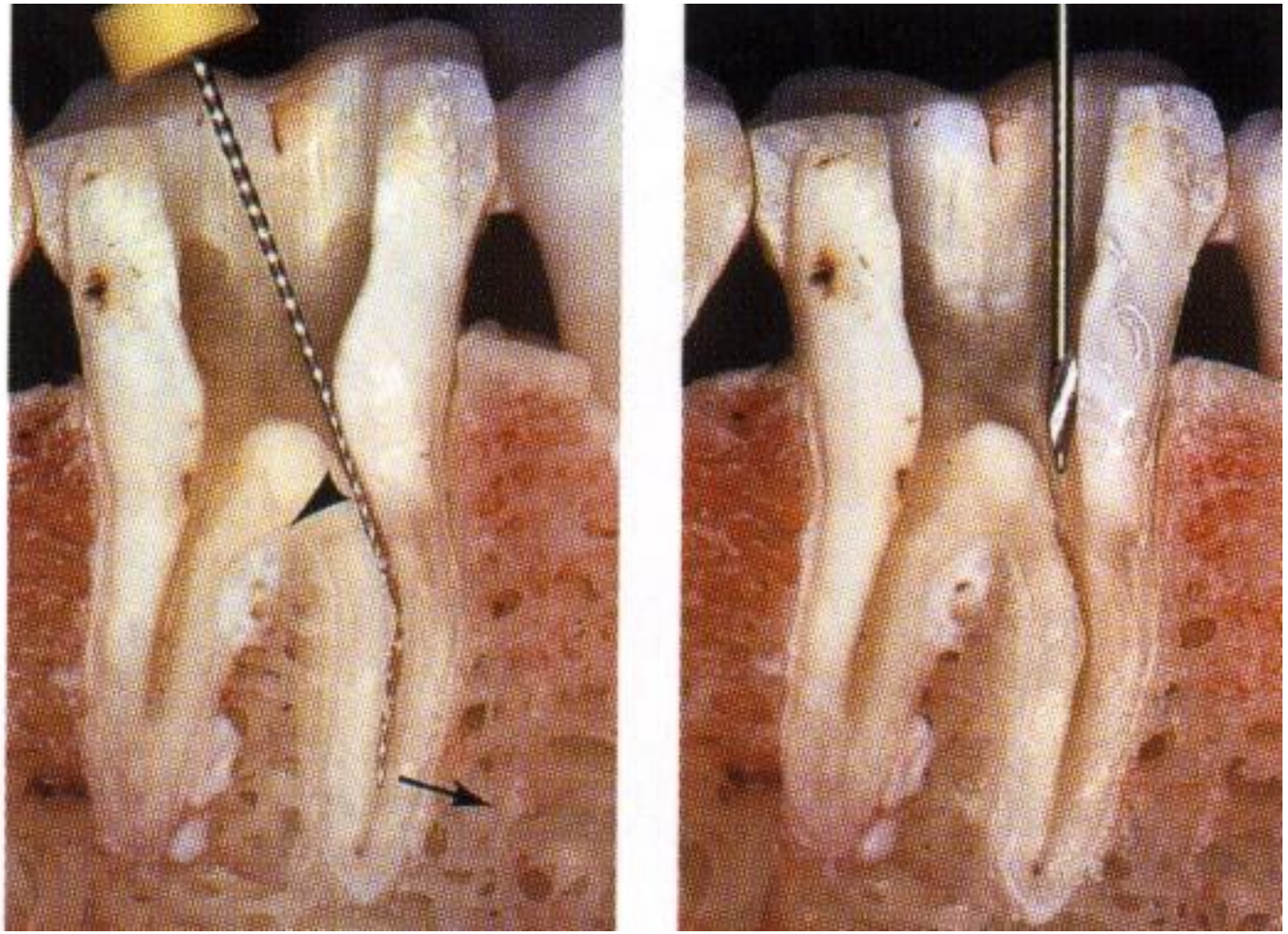
Phases of the endodontic treatment

- 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

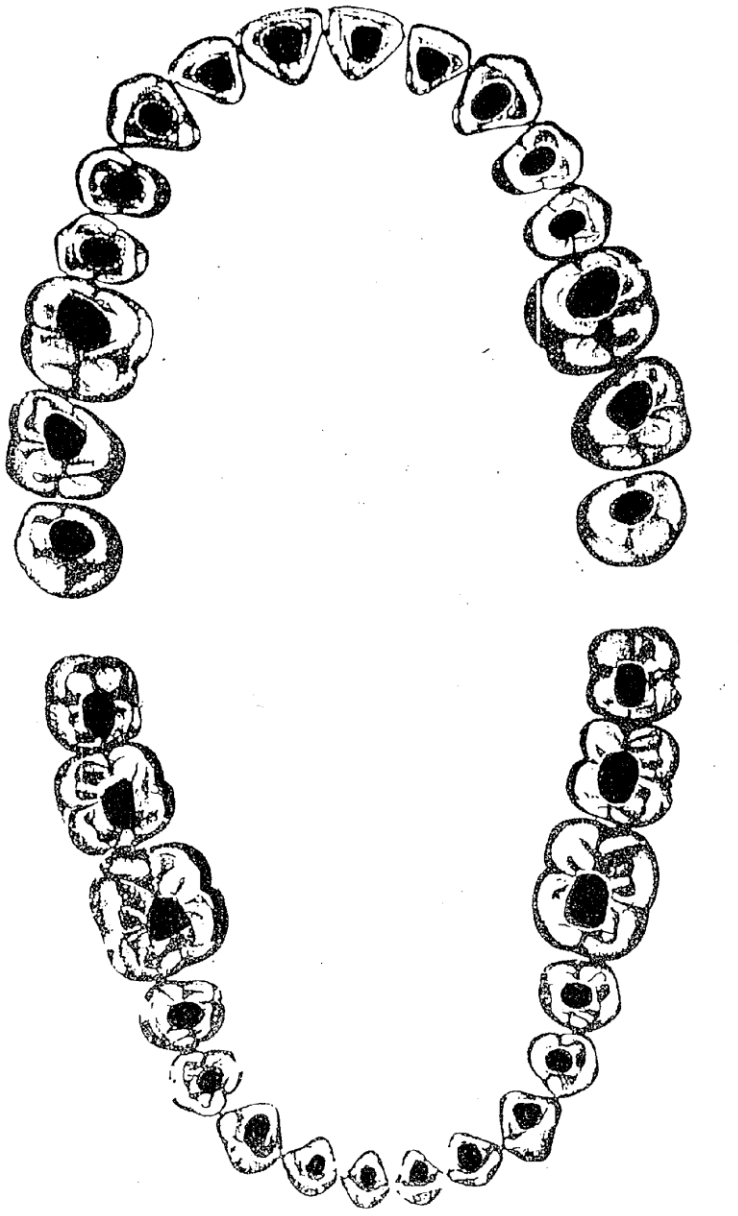


Rozšíření vchodu do kanálku

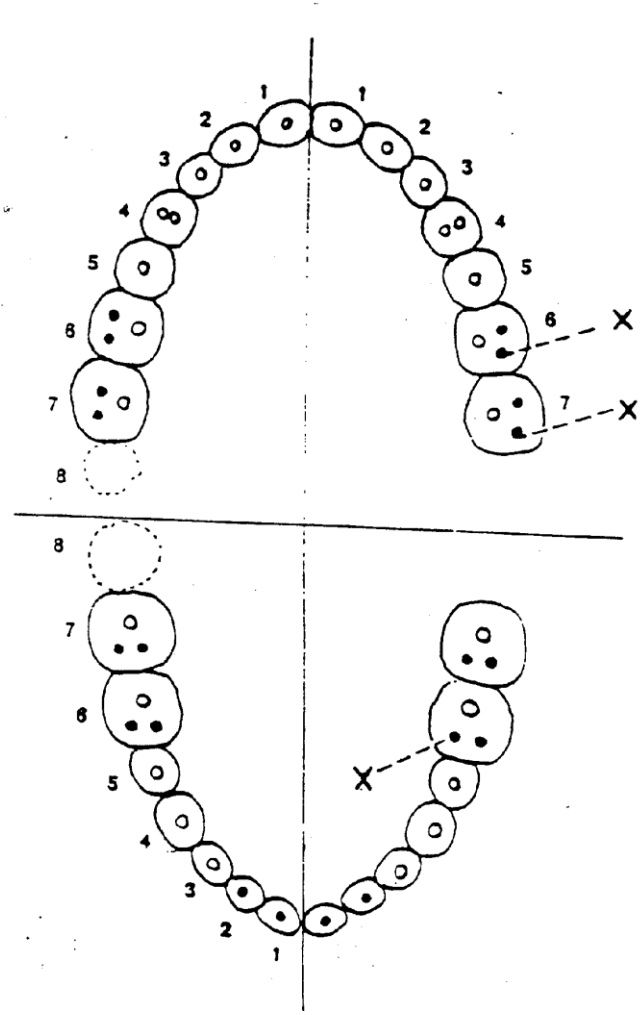


Shapes of endo cavities

See special material on is



Number of root canals



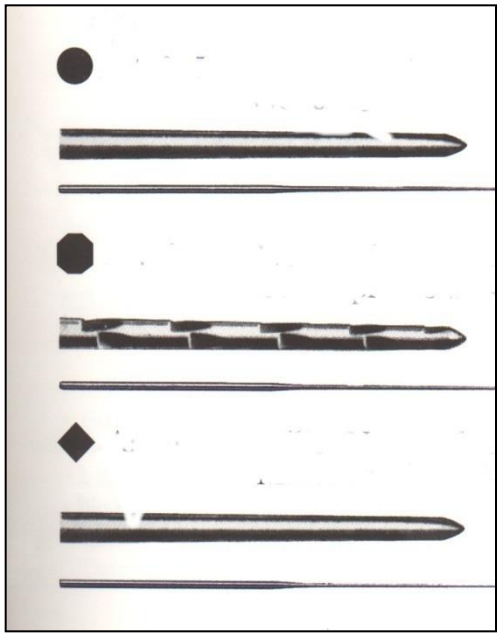
Instruments

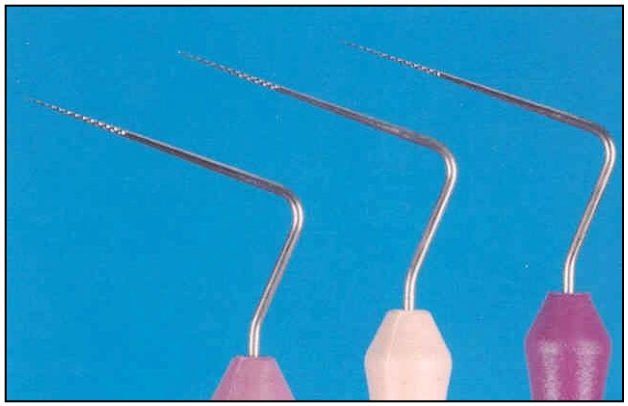
Dia trepan

Dia balls

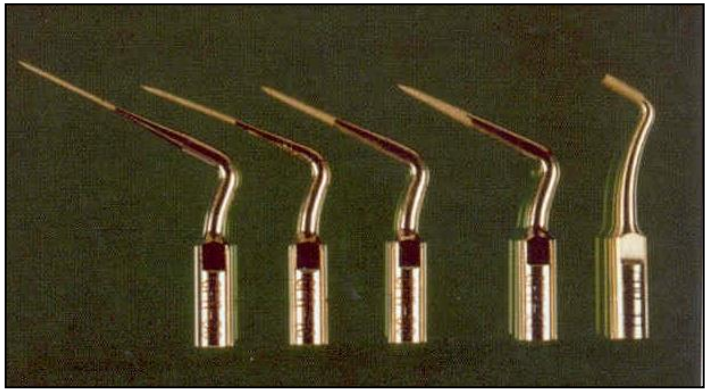
Ball burs

Nalezení a rozšíření vstupu do kořenových kanálků





Endodontické sondy, microopenery

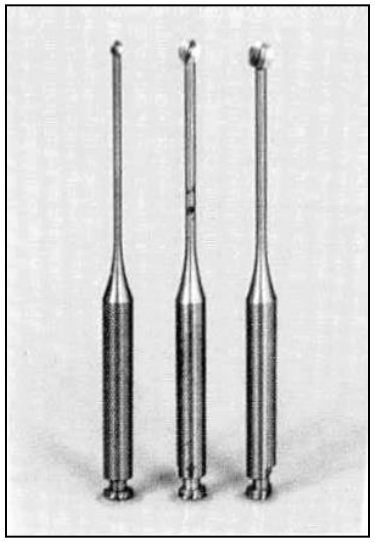


Uz špičky

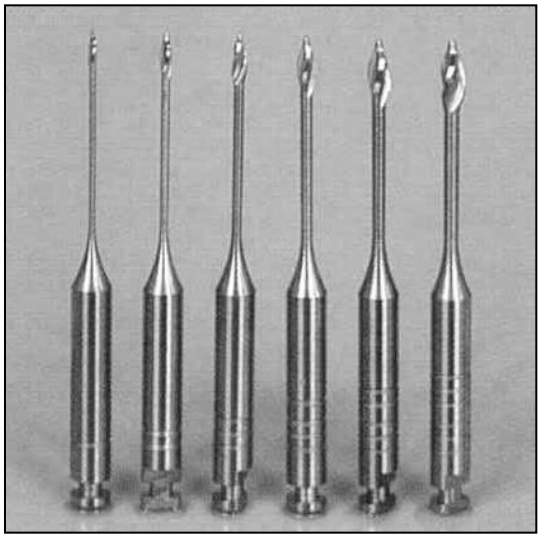
Barviva

Opening of root canals

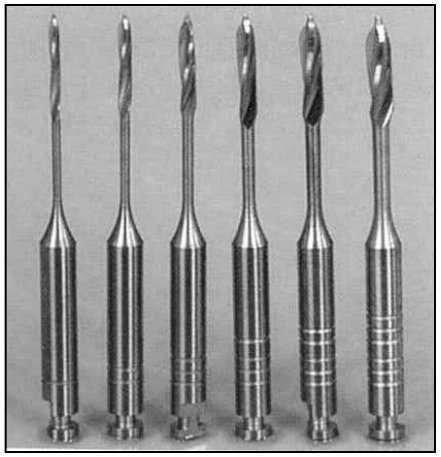
Ball burs



Miller‘s burs



Gates Glidden‘s burs



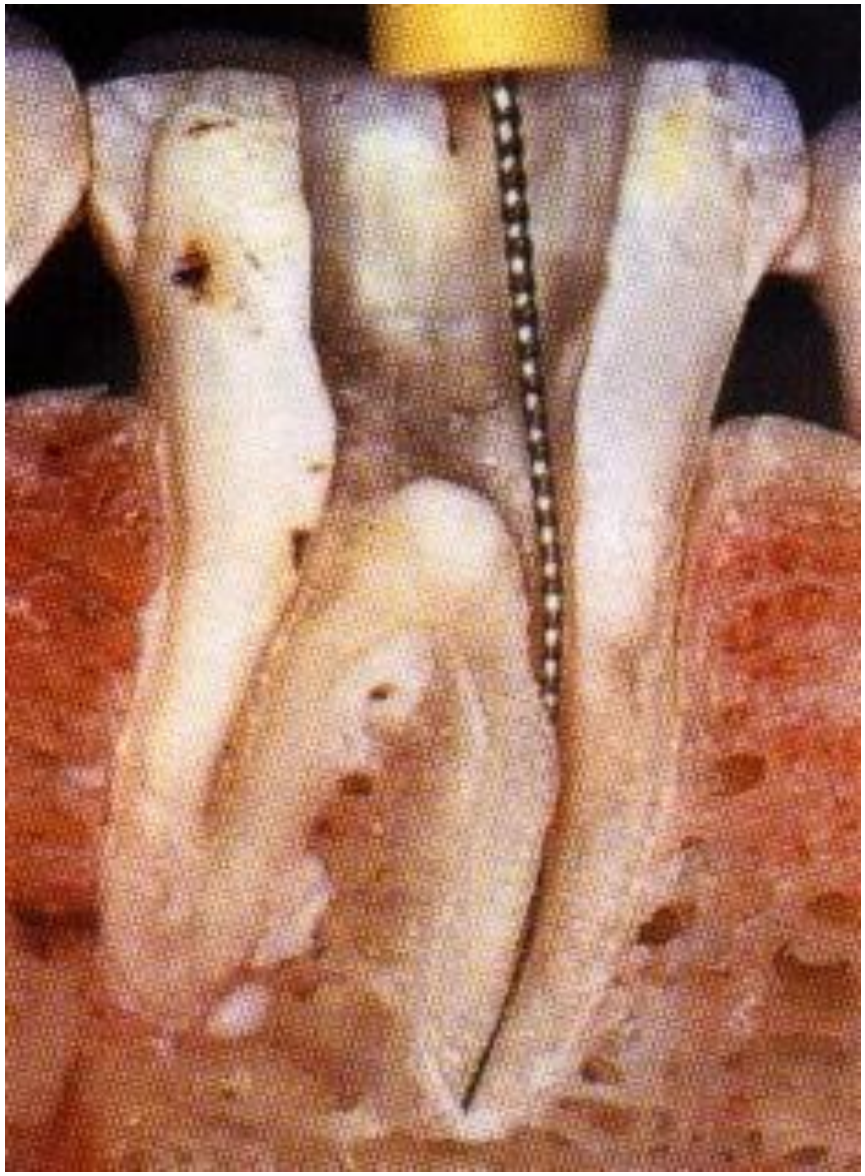
Peeso – Largo


DENTSPLY
MAILLEFER
F 0001 016
E 0153 012
E 0123 010
E 0123 014
F 0199 016
X-Gates

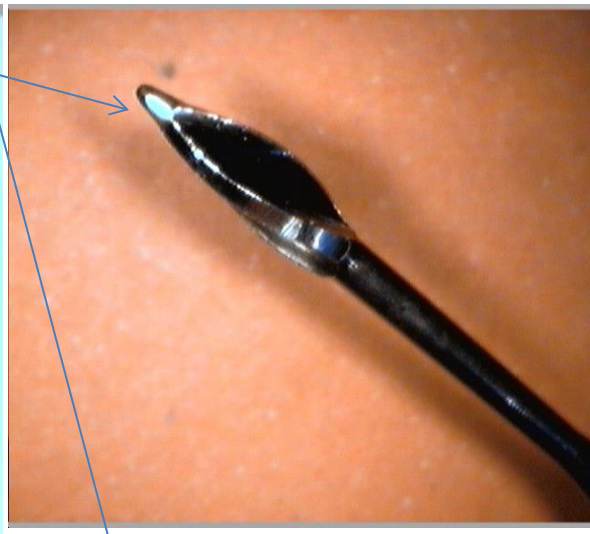
Access kits

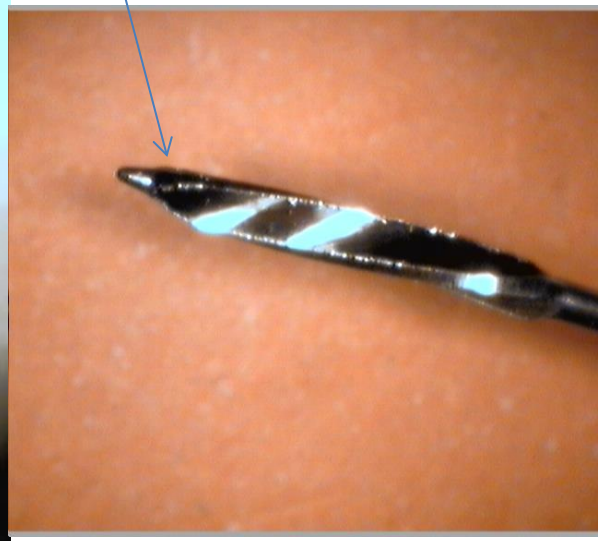

DENTSPLY
MAILLEFER
F 0001 016
E 0153 012
E 0123 010
E 0123 014
Endo Z
X-Gates

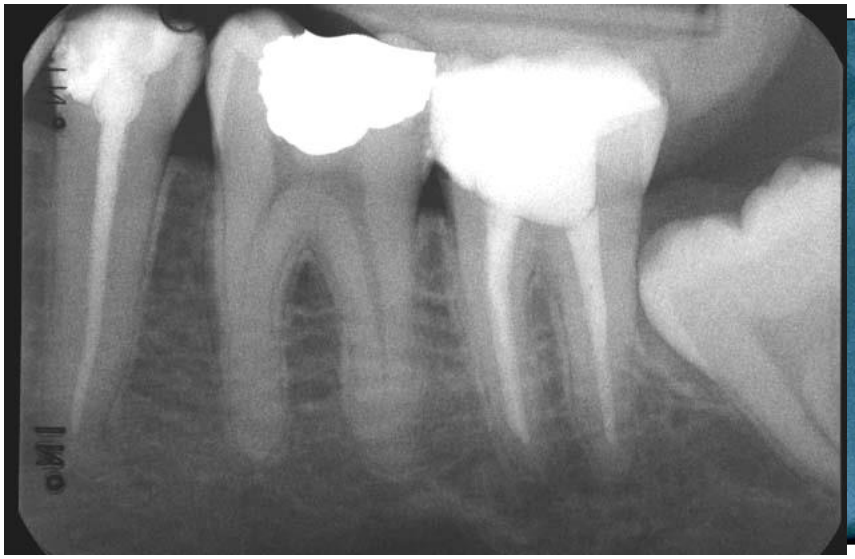
Stav po trepanaci dřeňové dutiny a rozšíření vchodu do kořenového kanálku



Vchodové rozšiřovače: Gates Gliddenův vrtáček, Peeso - Largo



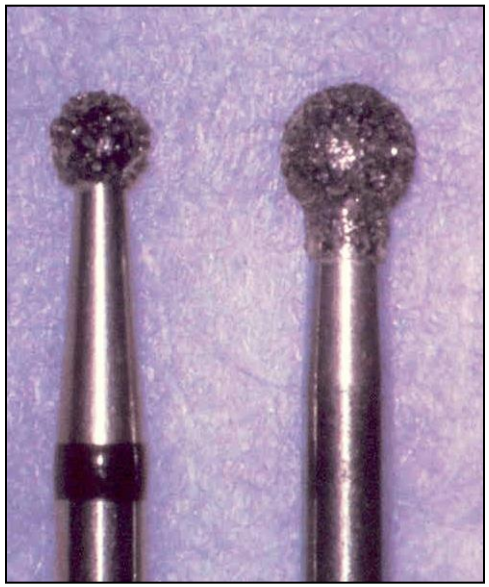




The wall is weakend

Opening of the pulp chamber Access

Dia trepan



Dia round burs – balls

Steel round burs

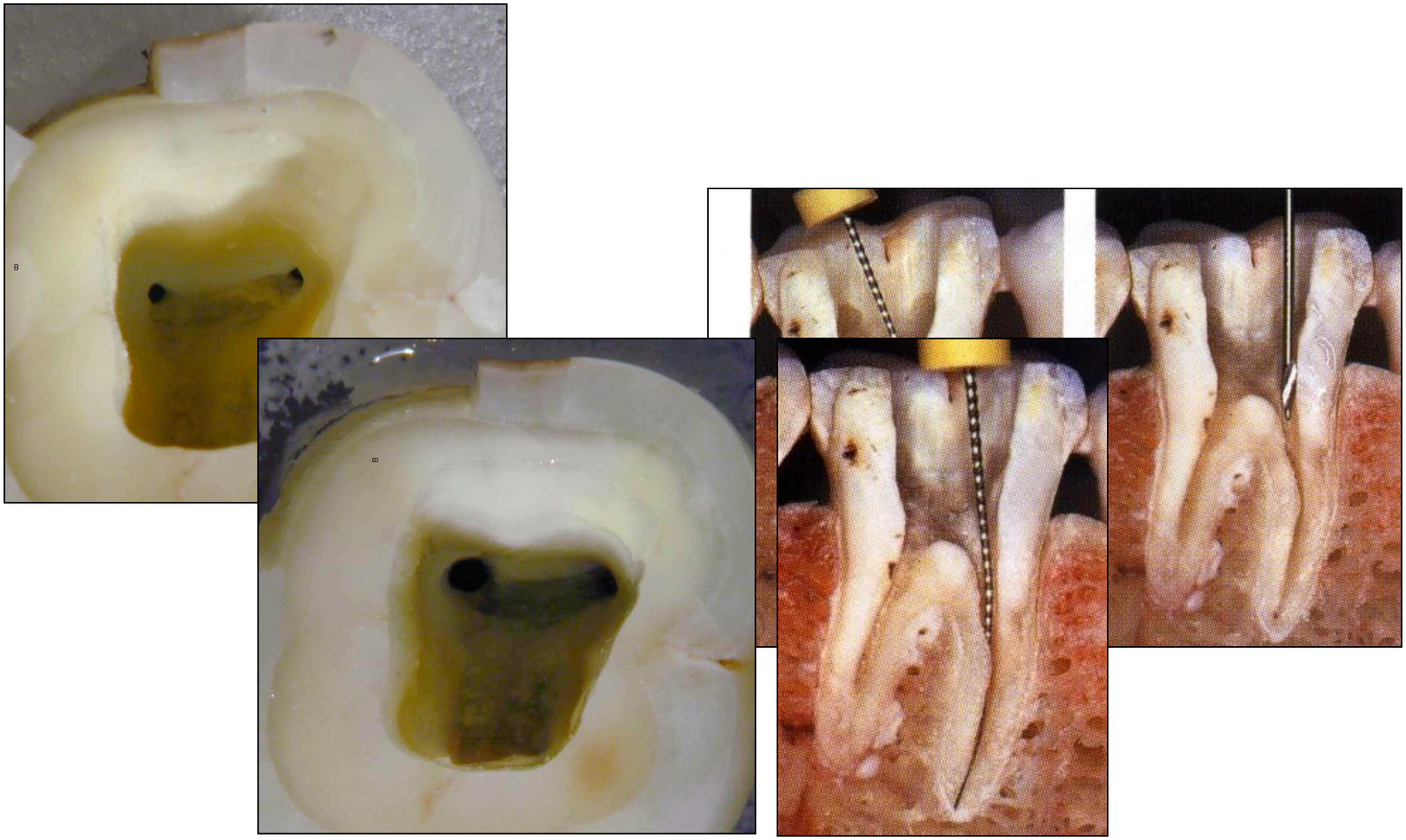
Preparation of the endodontic cavity

Dia trepan

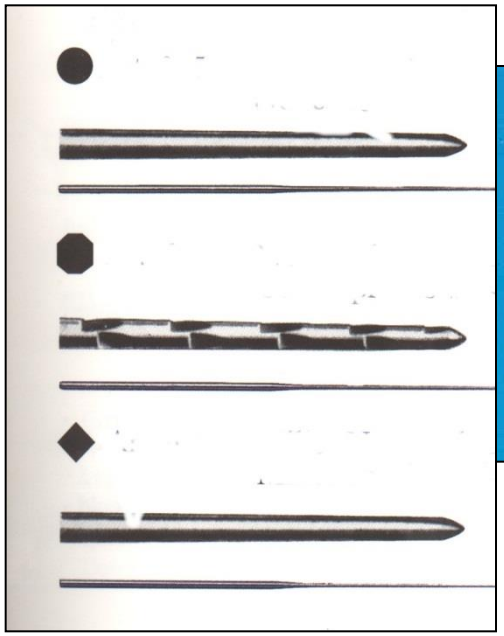
Safe ended tips
Batt´s instruments

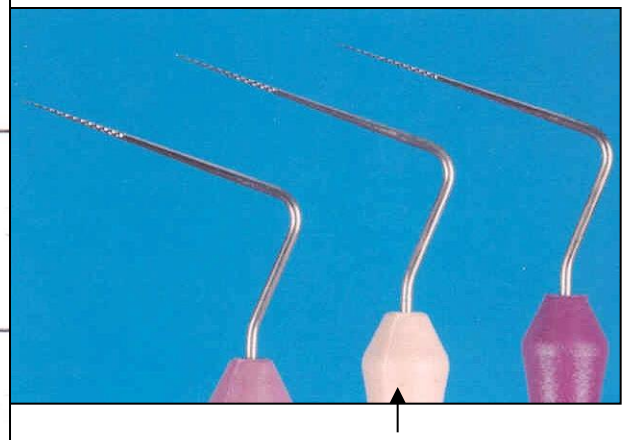
Fissur bur

Finding of the root canal orifice

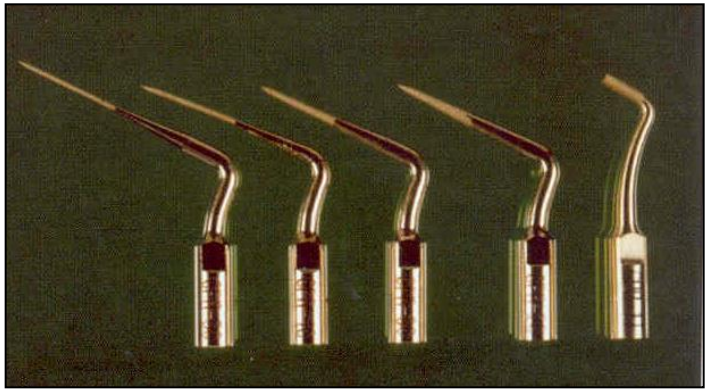


Finding and opeing of rot canal orifices





Endodontic probes
Microopeners

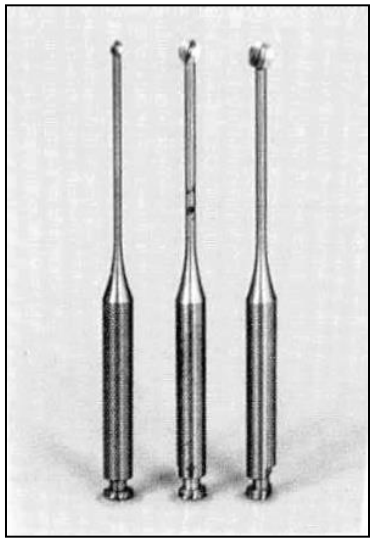


Ultrasound tips

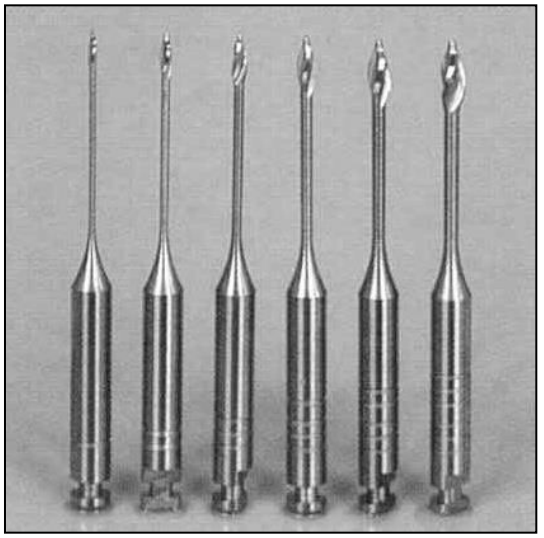
Dye

Finding and opening of root canal orifices

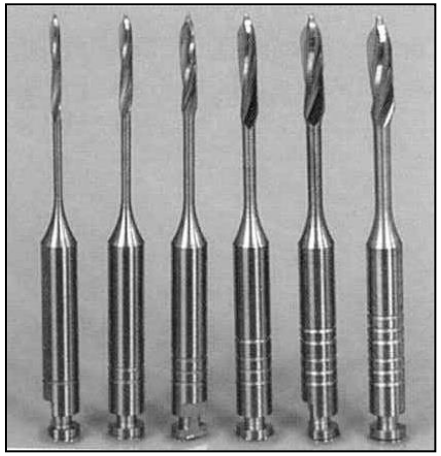
Rounded burs - balls



Miller´s burs



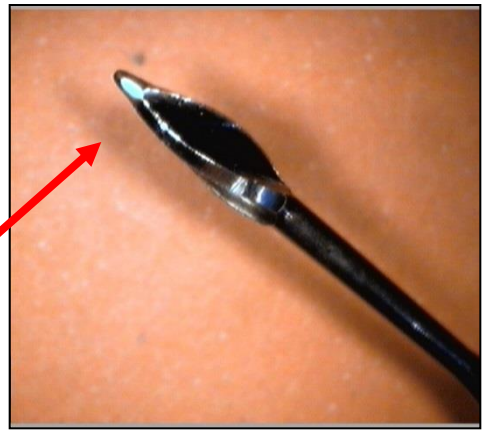
Gates Glidden´s burs



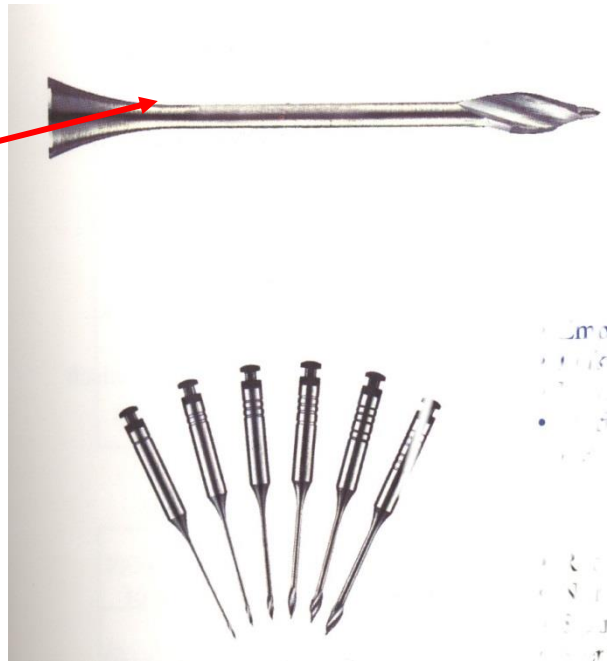
Peeso – Largo


Gates - Glidden

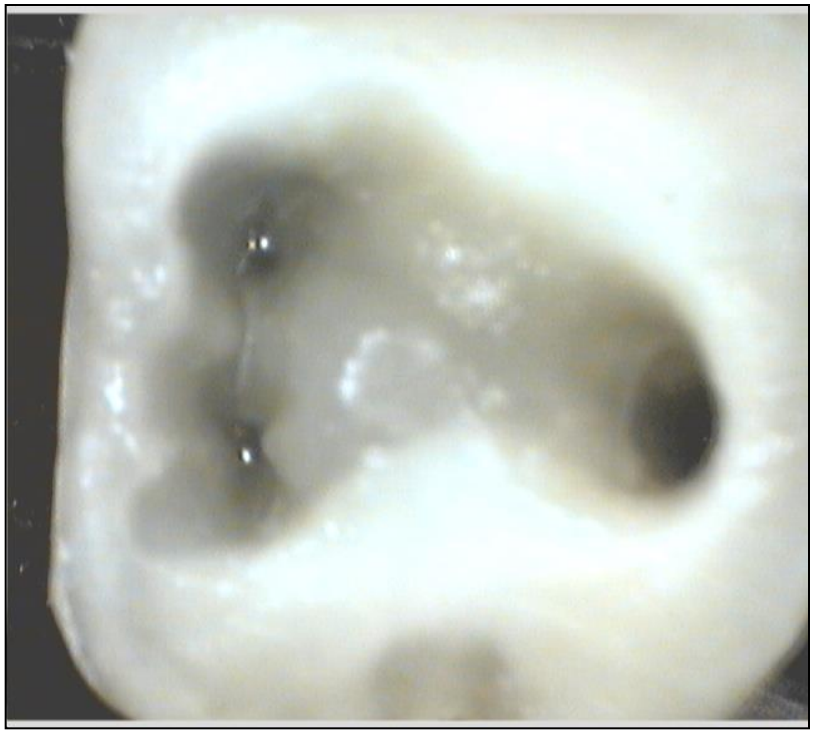

Peeso-Largo



Gates – Glidden:
Blunt, non active tip

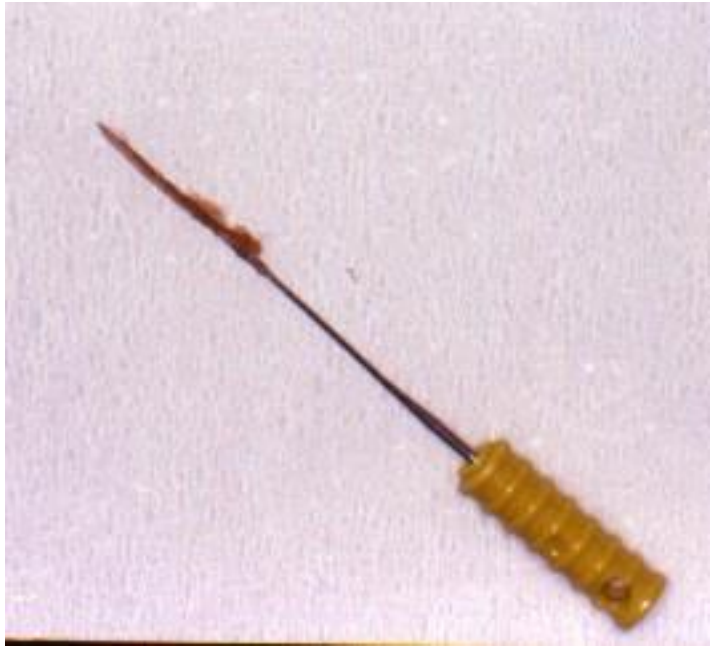


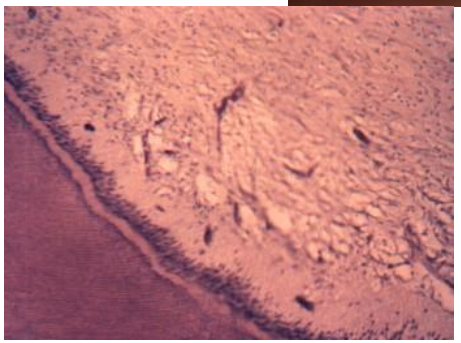
Programm point of breakage



Ultrasound

Pulpextractor





Soft wire
Prickles like harpune
Insertion
Rotation
Exstirpation

Canal shaping

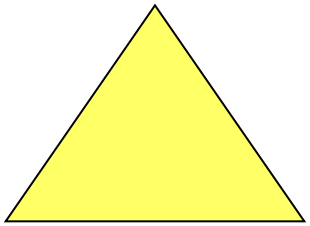
- Reamers (penetration)
- Files (shaping)

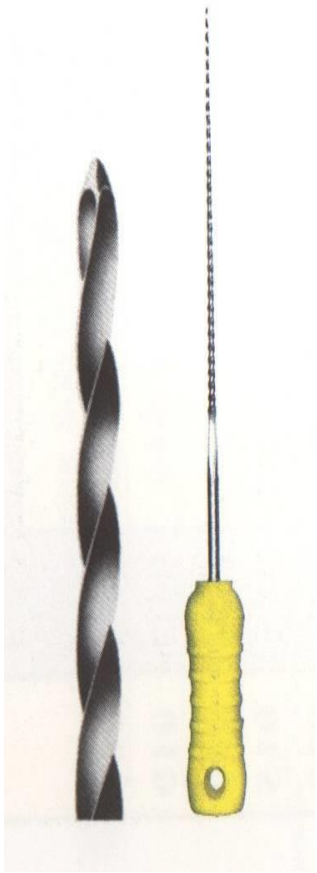
Reamer

K -reamer

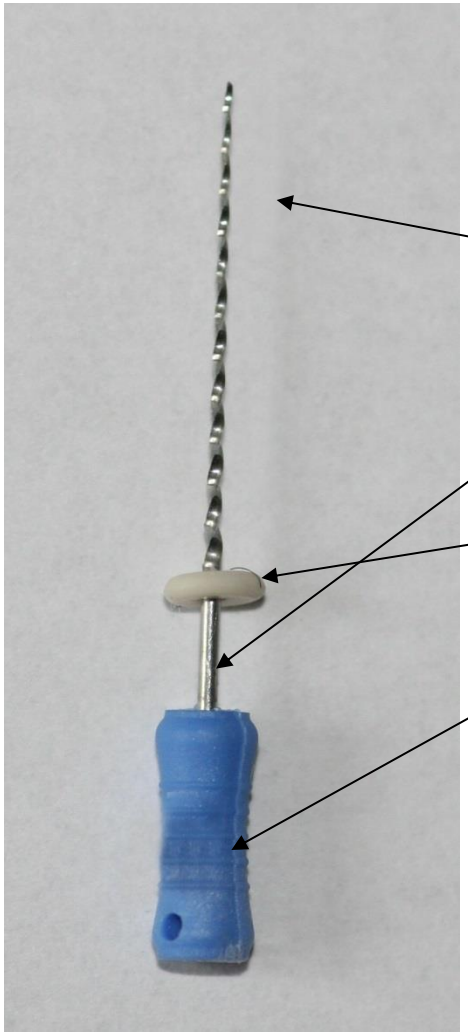
Triangl or square wire spun

Symbol





Reamer



Bladed part

Shank

Stopper

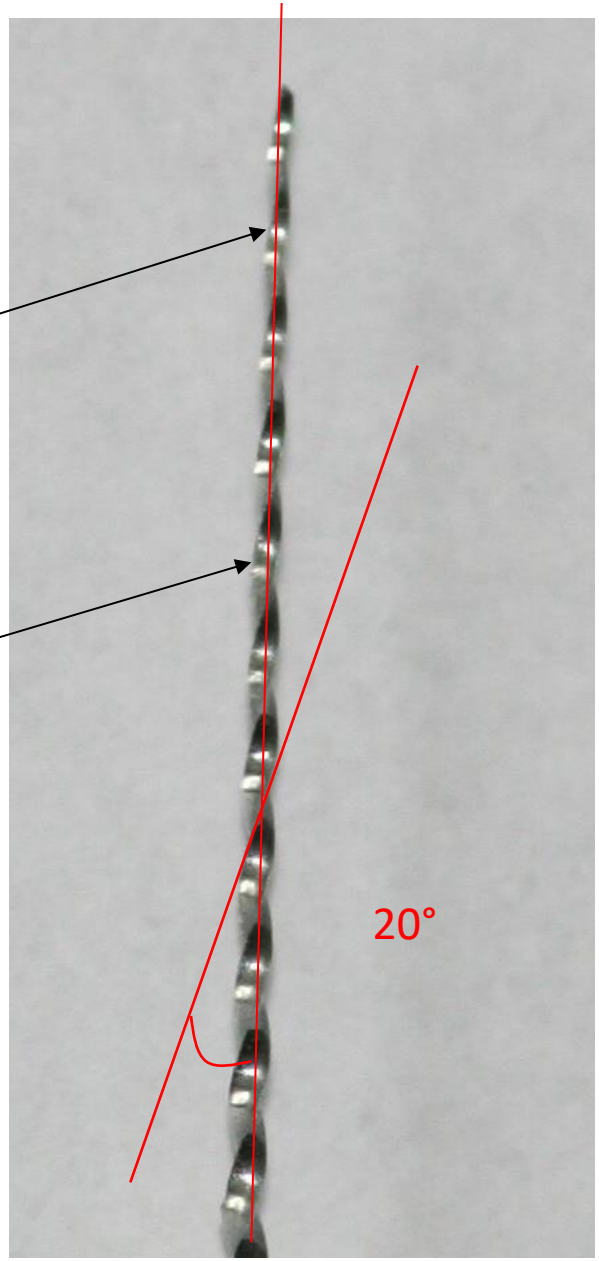
Grip

Reamer

Blades

Space for dentin chips

Rotation – reaming achtion - panetration



Reamer

Rotation (clockwise) – penetration

Application of plastic material (contraclockwise)

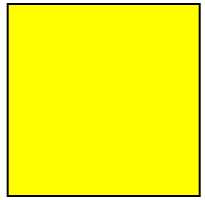
Files

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

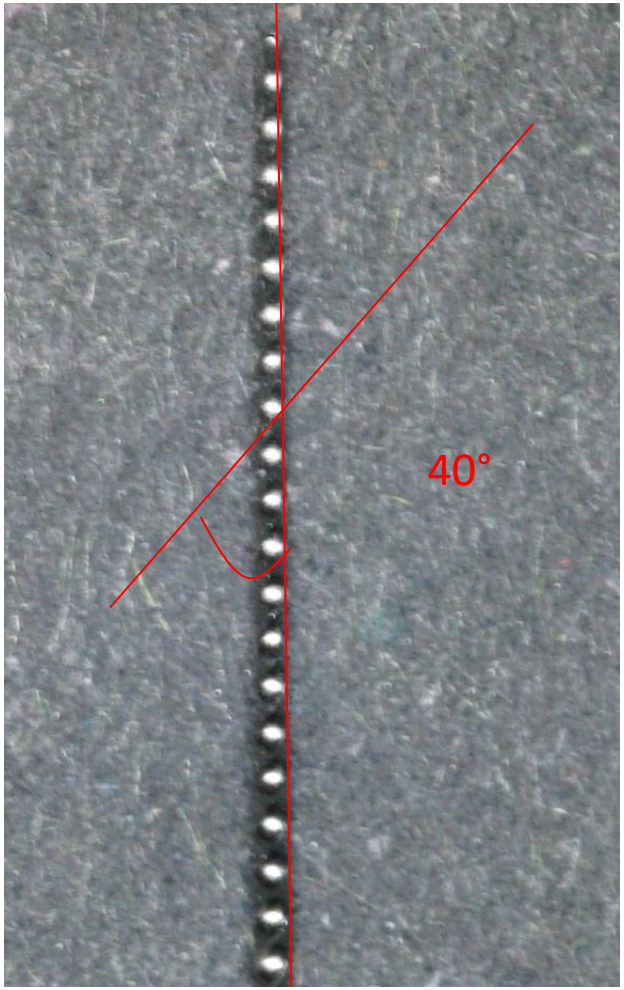


K-file

Filing

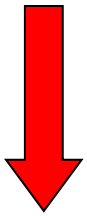
Also rotation

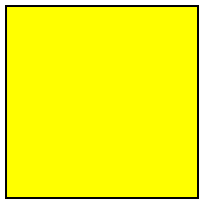
45° – 90°



K-flexofile, flexicut, flex-R

- Triangle wire always



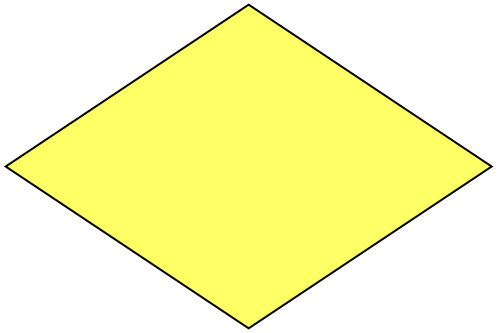


Flexibility

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

Like K-file

K- flex



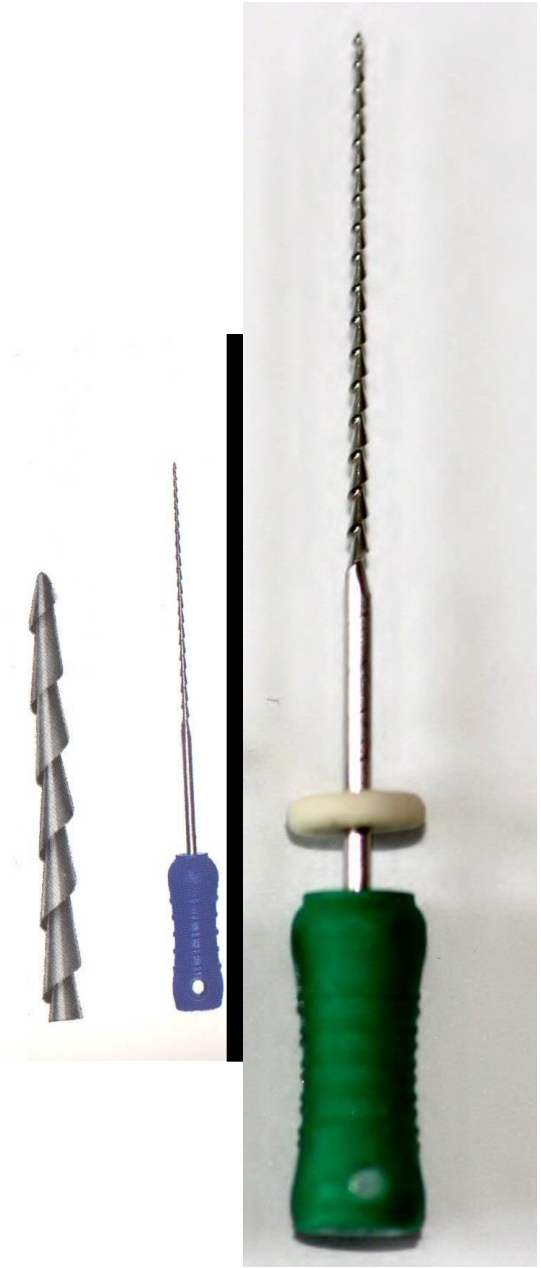
Rhombus
Two blades in action
Enough space for dentin chips
Flexibility, effifacy

K-file a reamer: rozdíl

H-file

= Hedstroem file

Ring

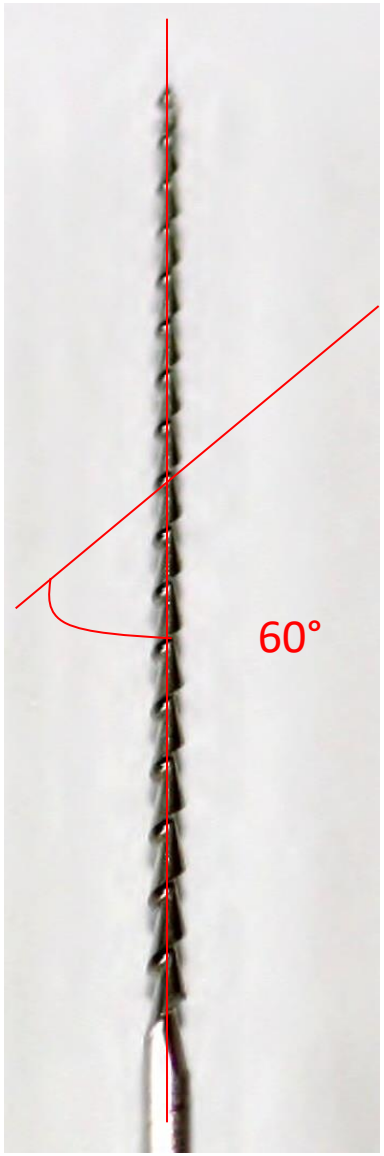


H- file

No rotation!!

Pull motion only!!

Risk of breakage in small sizes



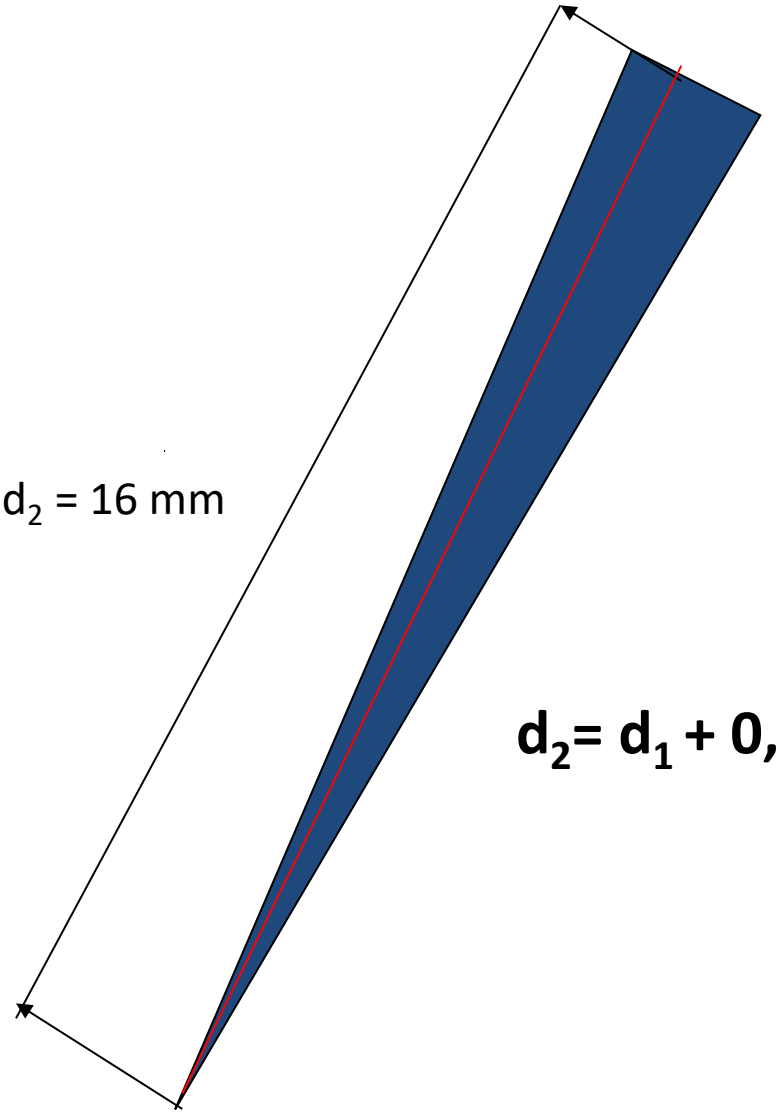
ISO

- 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



d_2

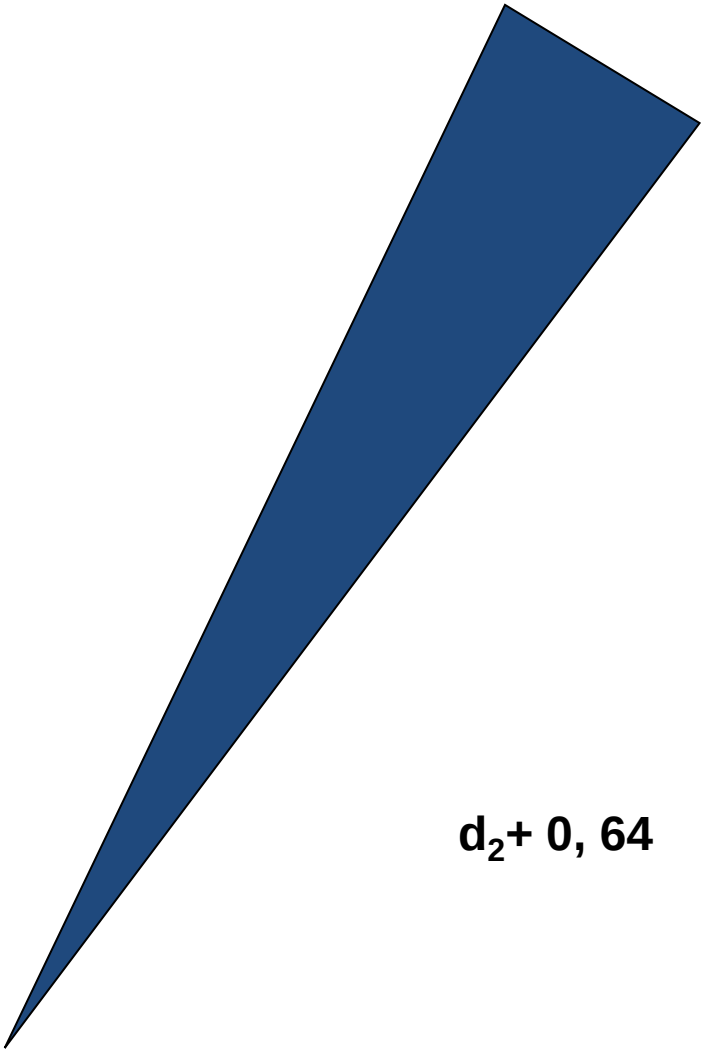
$d_1 - d_2 = 16$ mm

$d_2 = d_1 + 0{,}32$

d_1

Taper 2%

0,02 mm na 1mm



Kónus 4%

d_2

d_2**+ 0, 64**

d_1

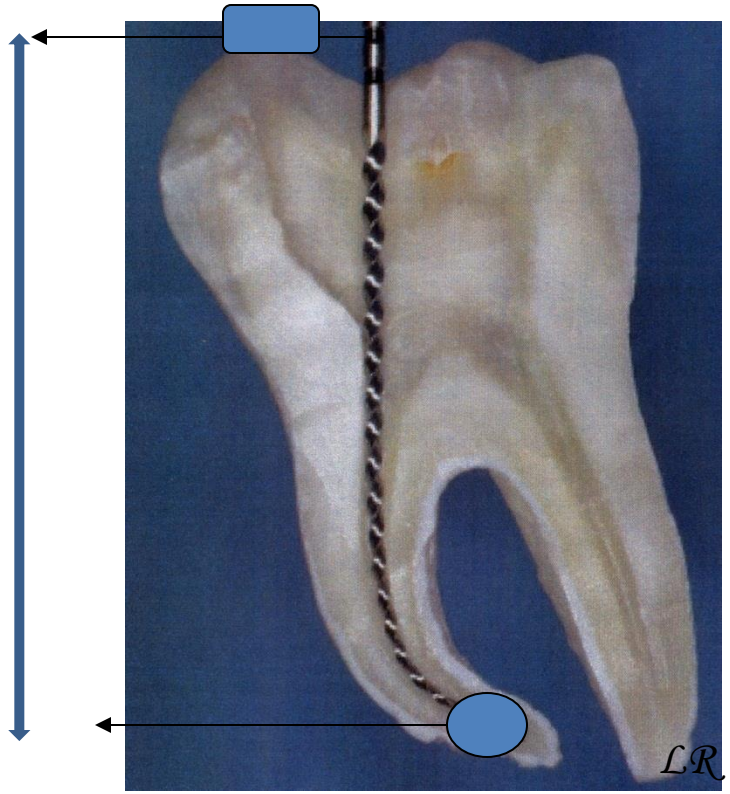
0,04mm na 1 mm

Initial flaring

Working length

- Dostance 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
- Godd condition for root canal filling

$\mathcal{LR}$

Radiogram

X-ray with inserted root canal instrument

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

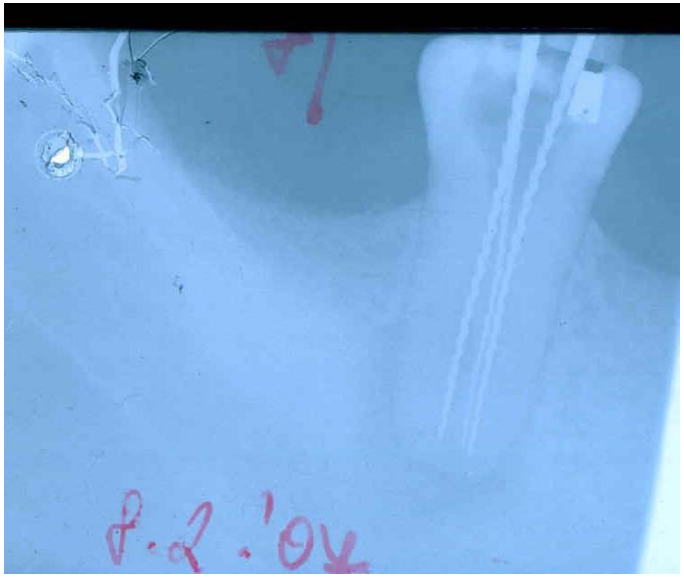
Tooth with clinical crown

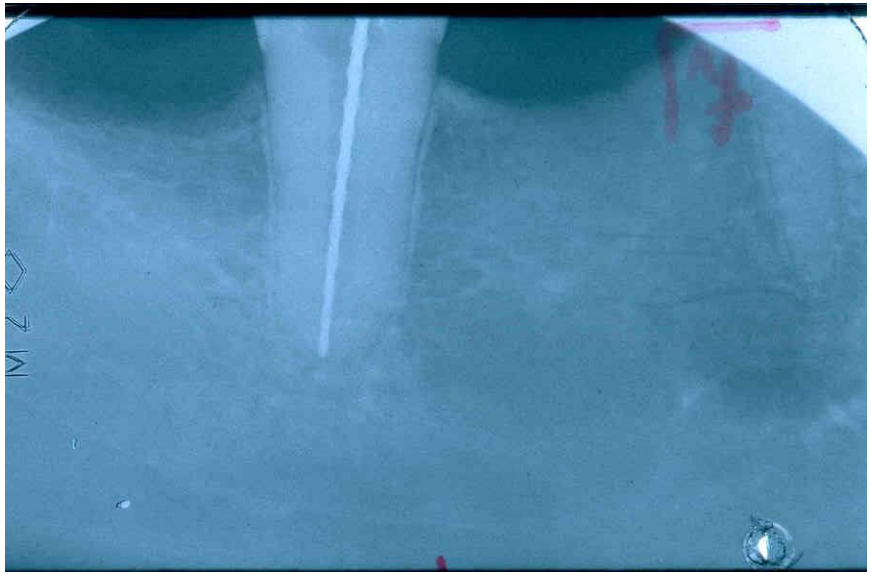
Procedure

- 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 diference 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

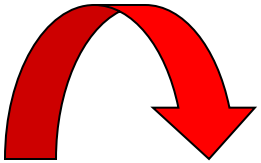
C20 -22

P18

M18

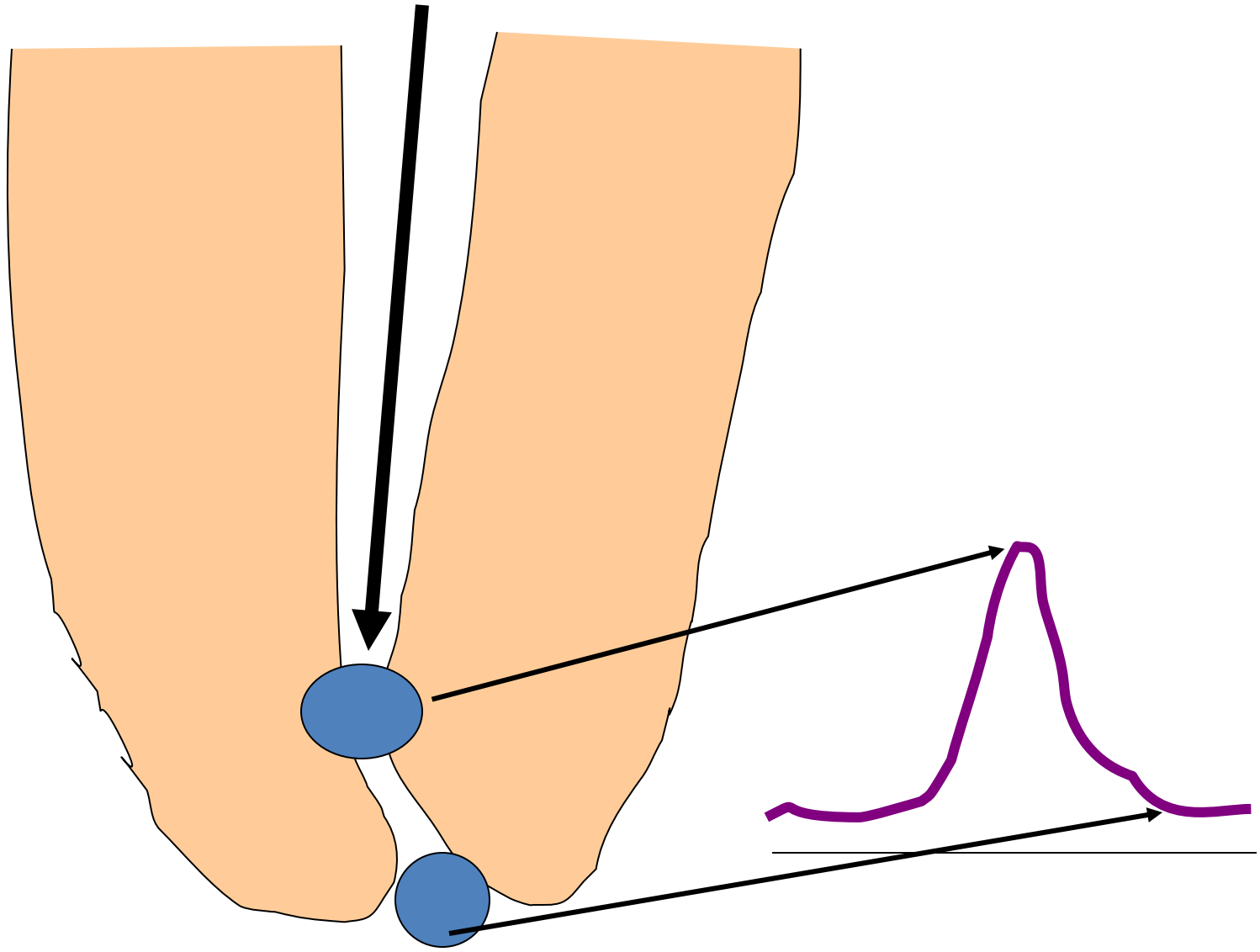
Endometry, odontometry

- Endometry

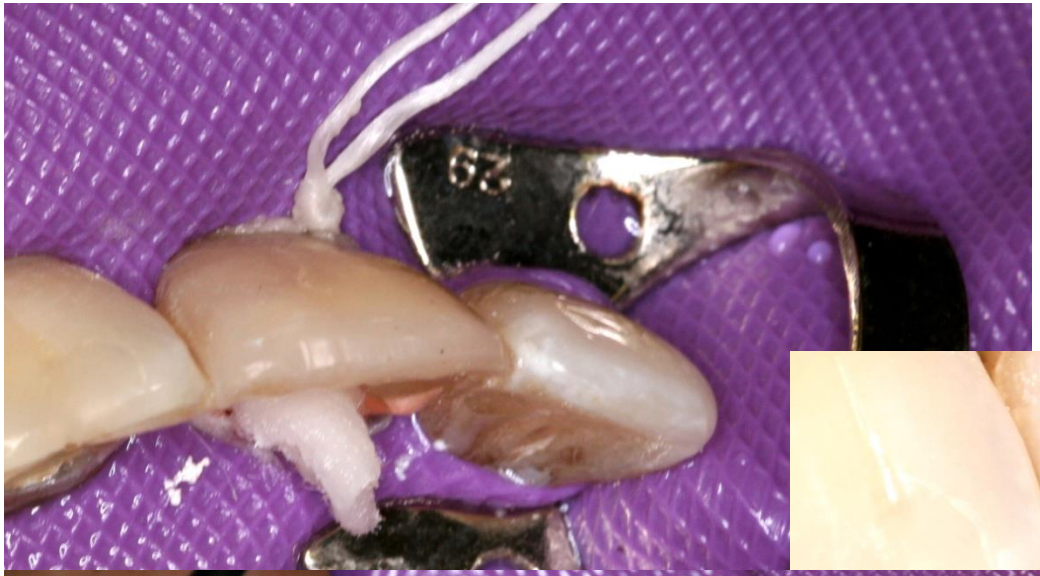


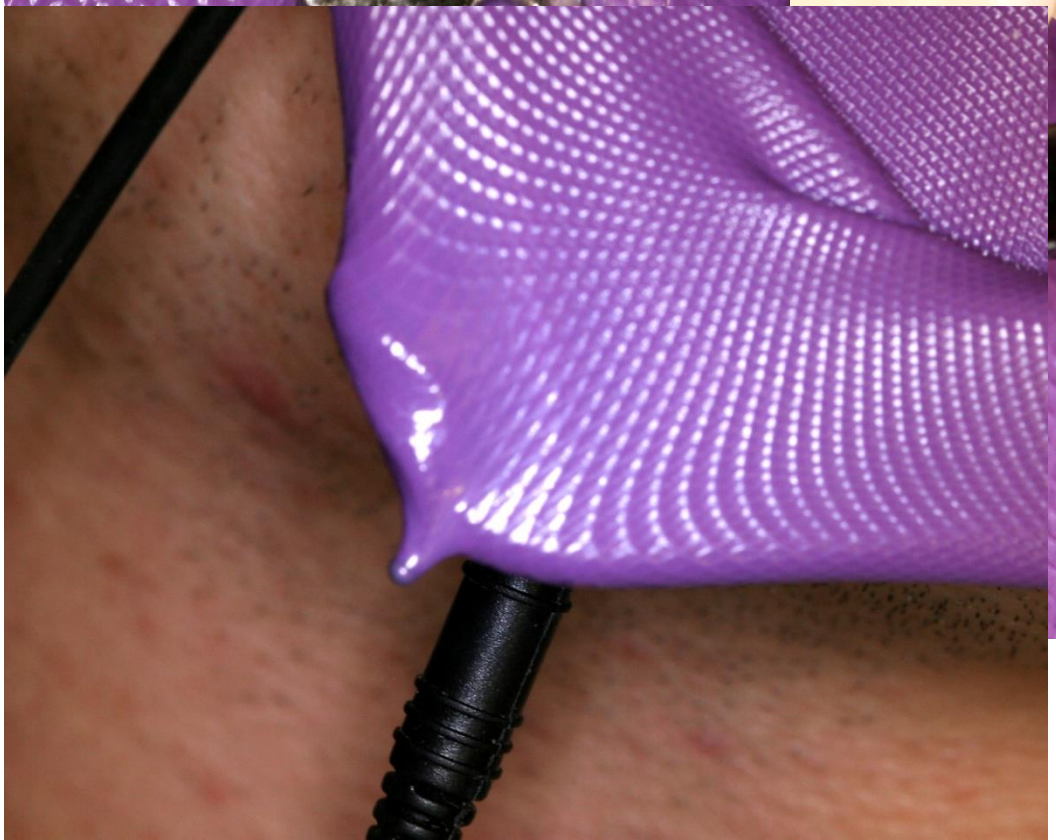
edevices based on measurement of electrical resistance

$\mathcal{LR}$



$\mathcal{LR}$

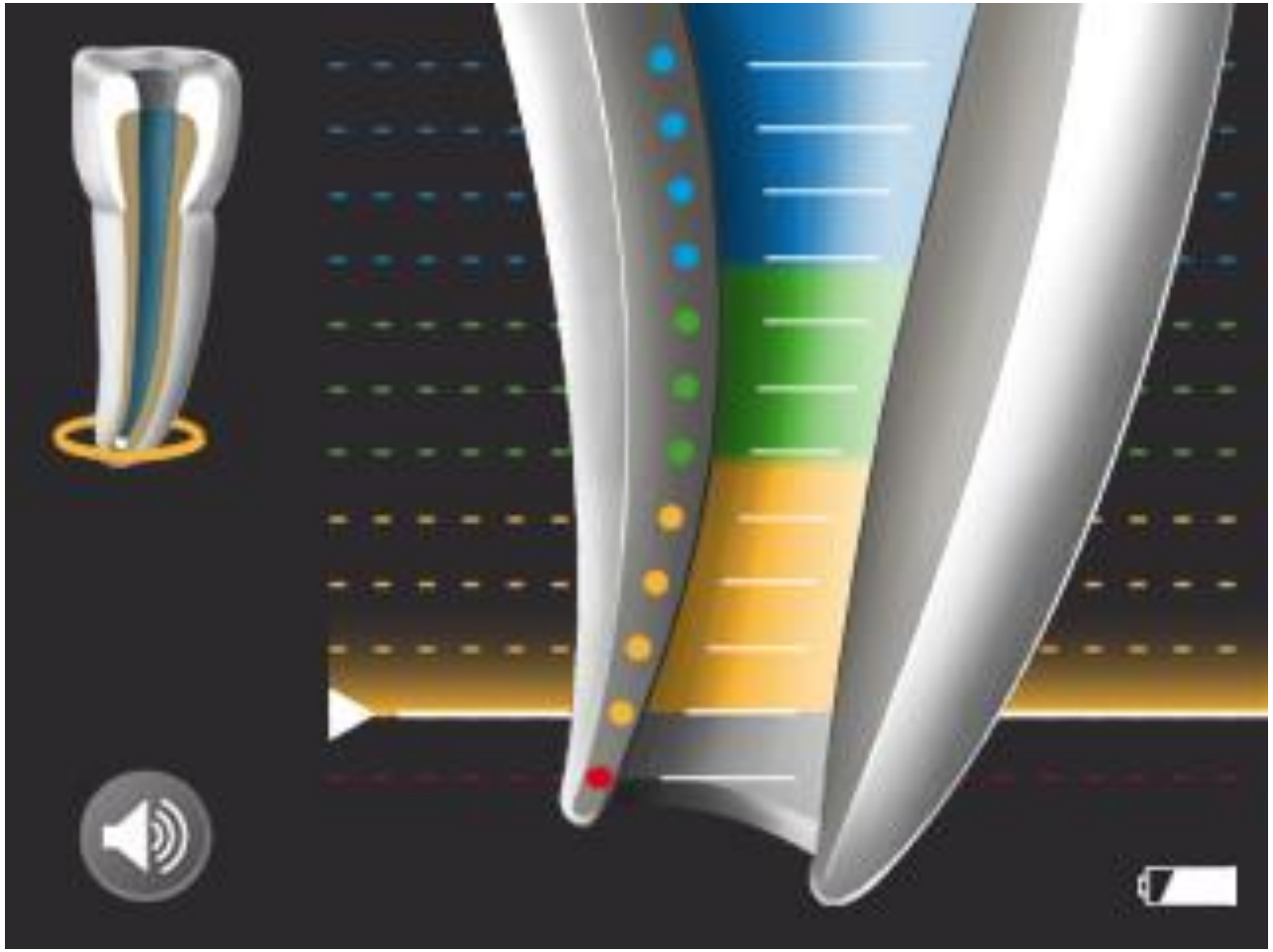


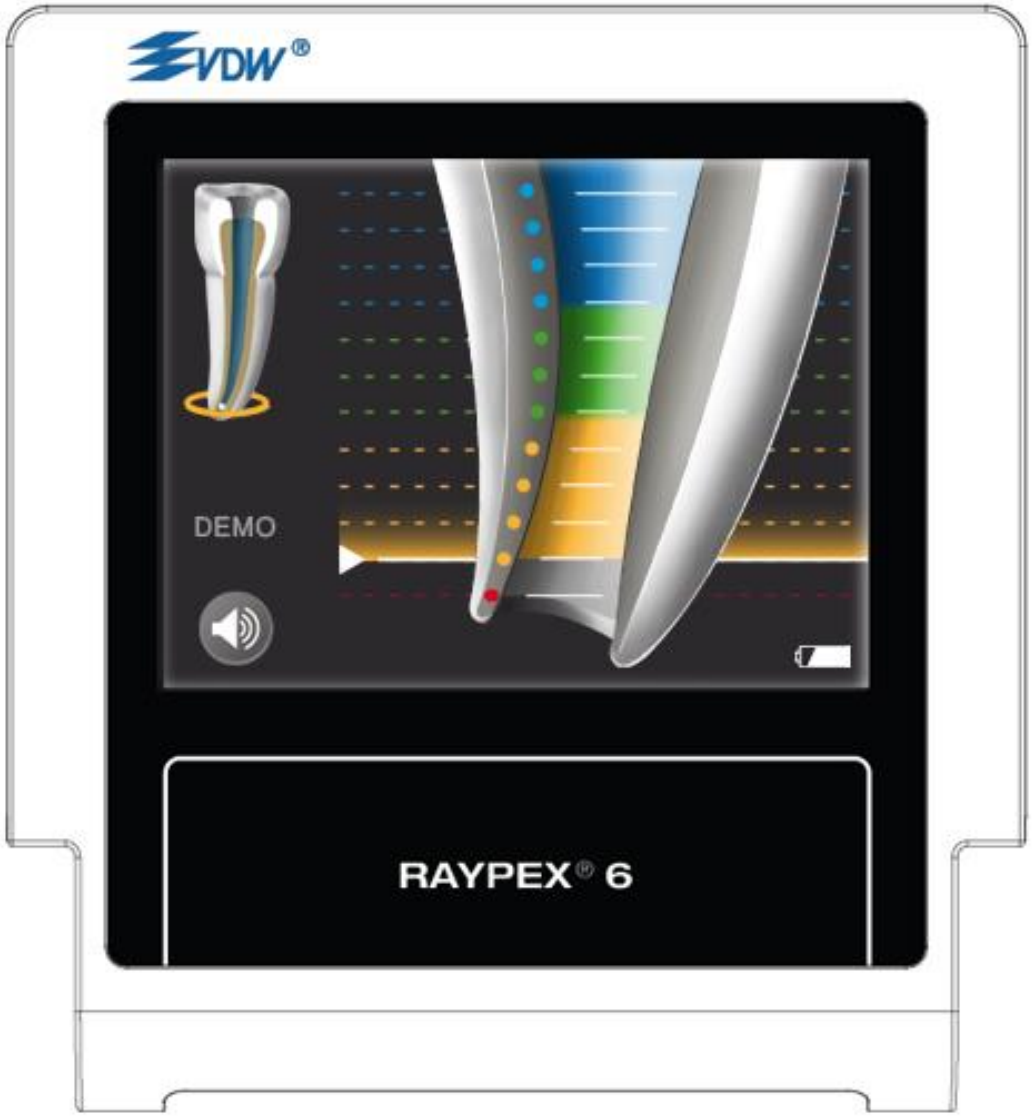


LR

RAYPEX® 6

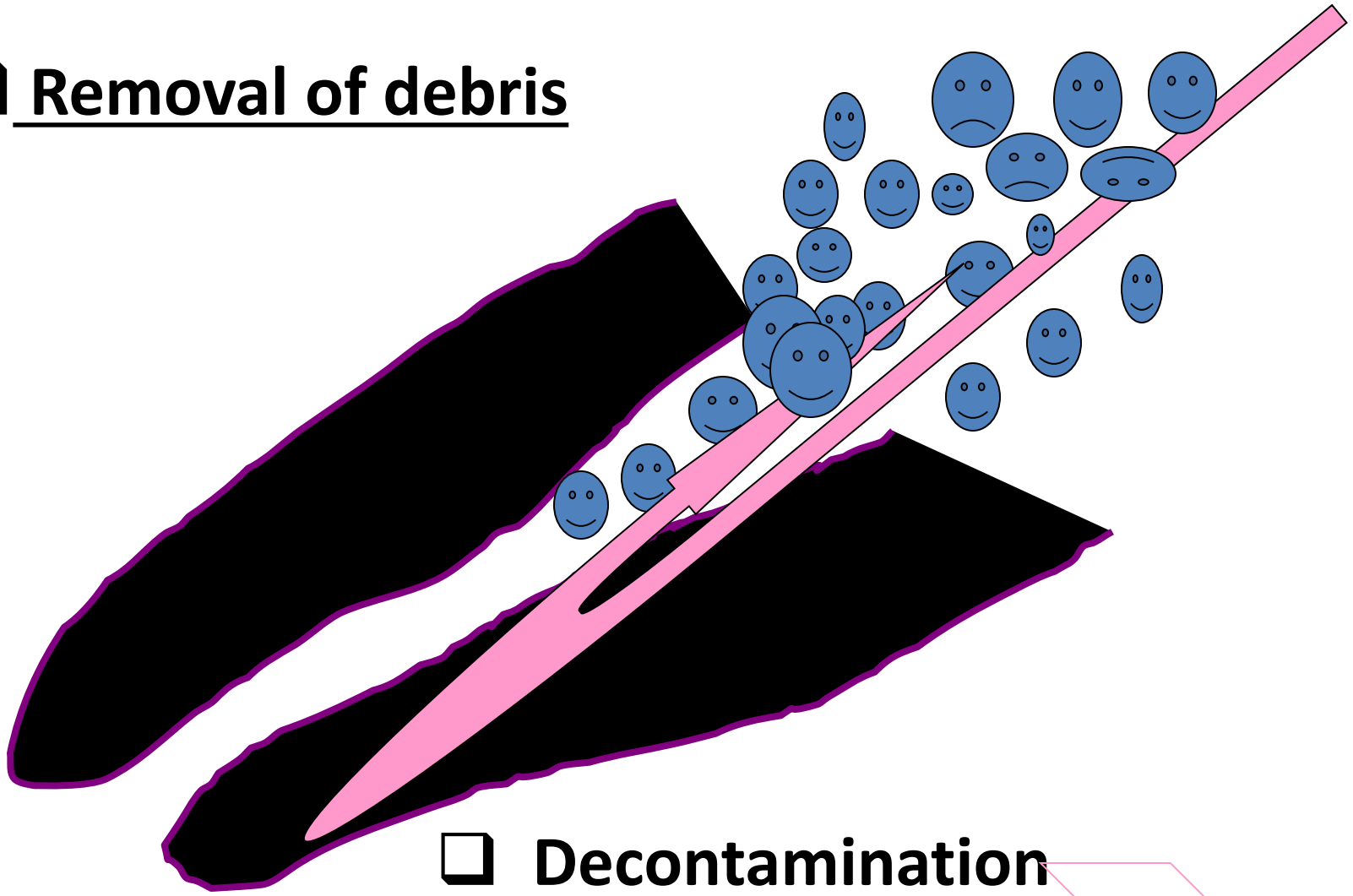
Měření – apikální zoom




VDW
DEMO
RAYPEX® 6

Irrigation

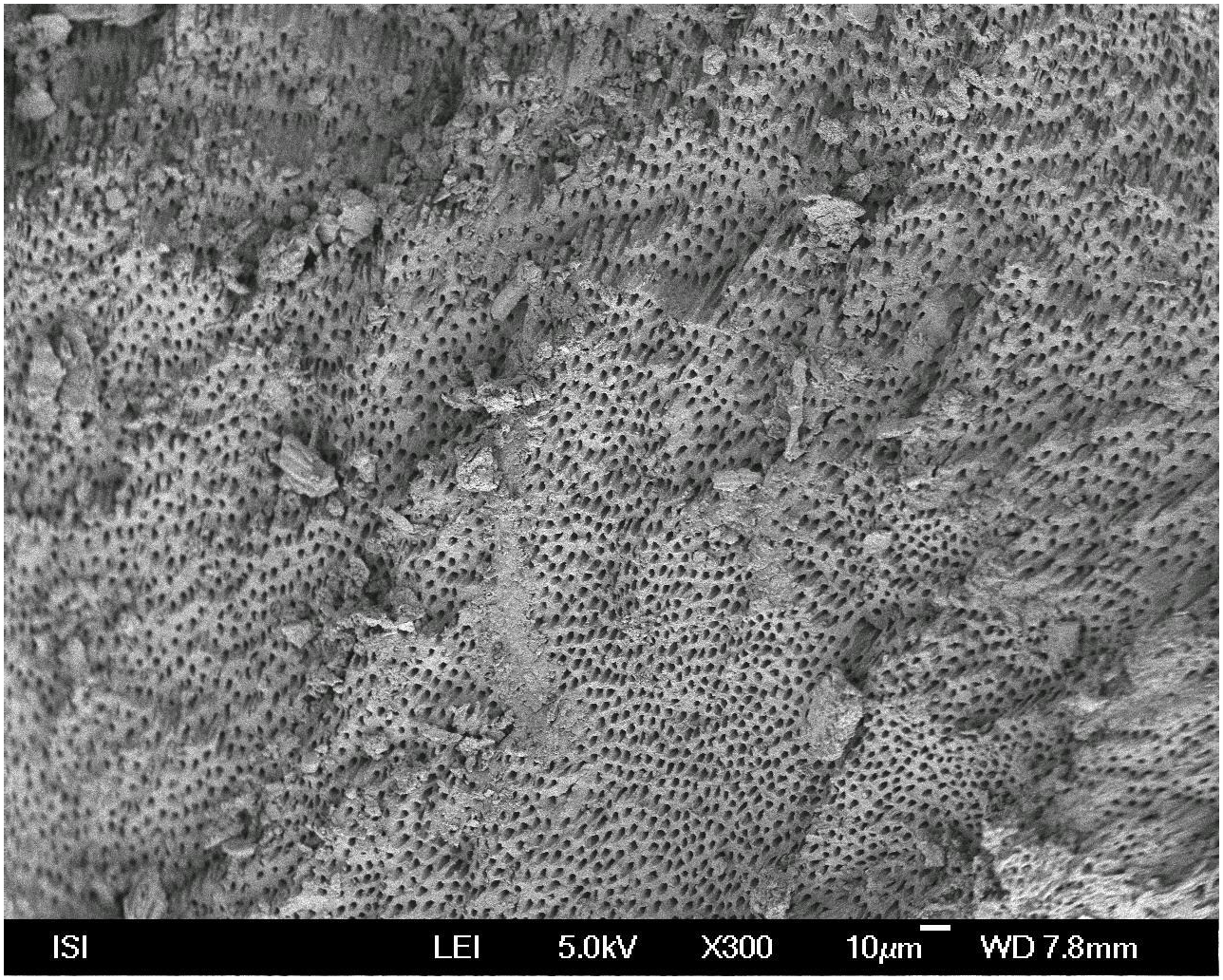
- **Removal of debris**

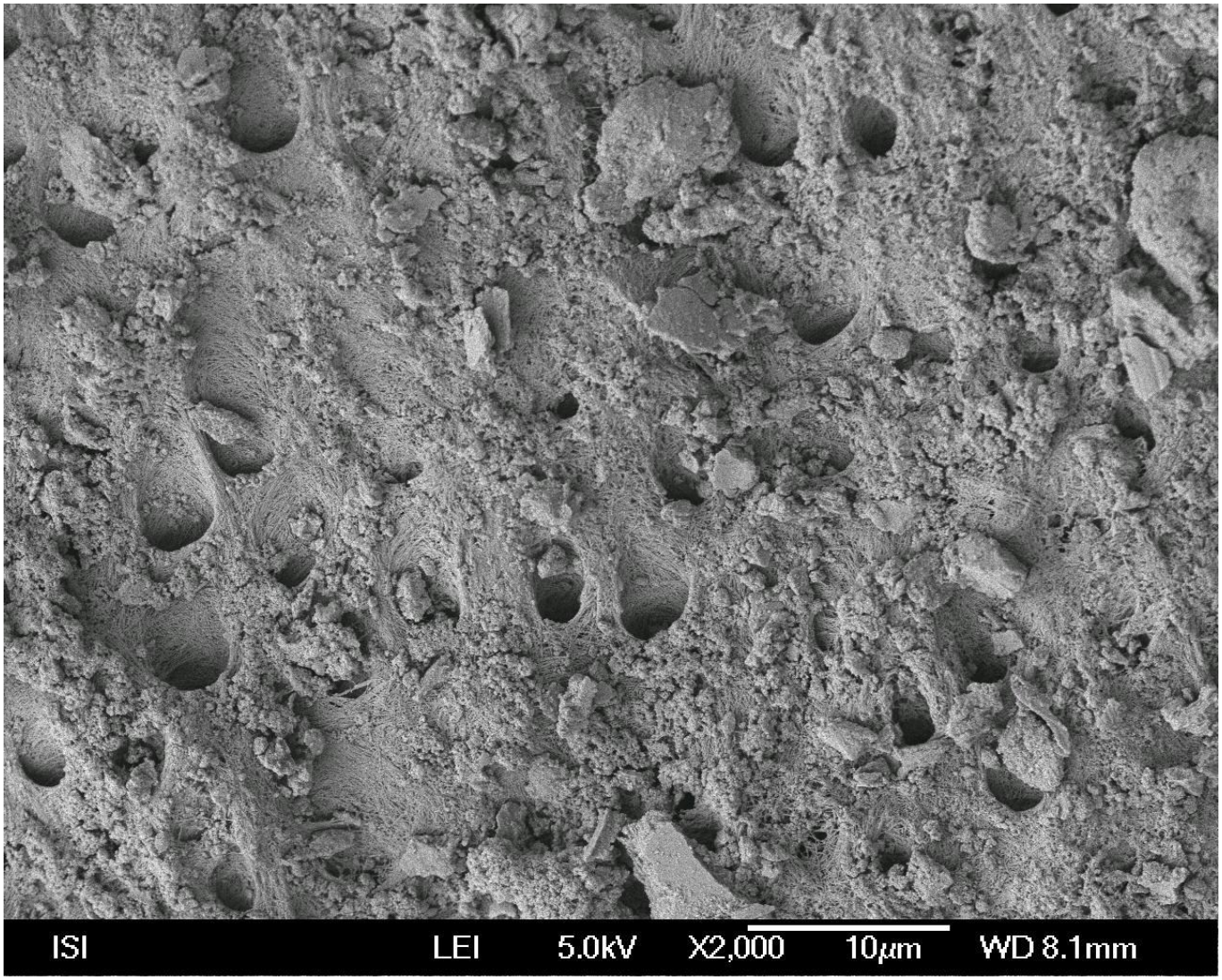


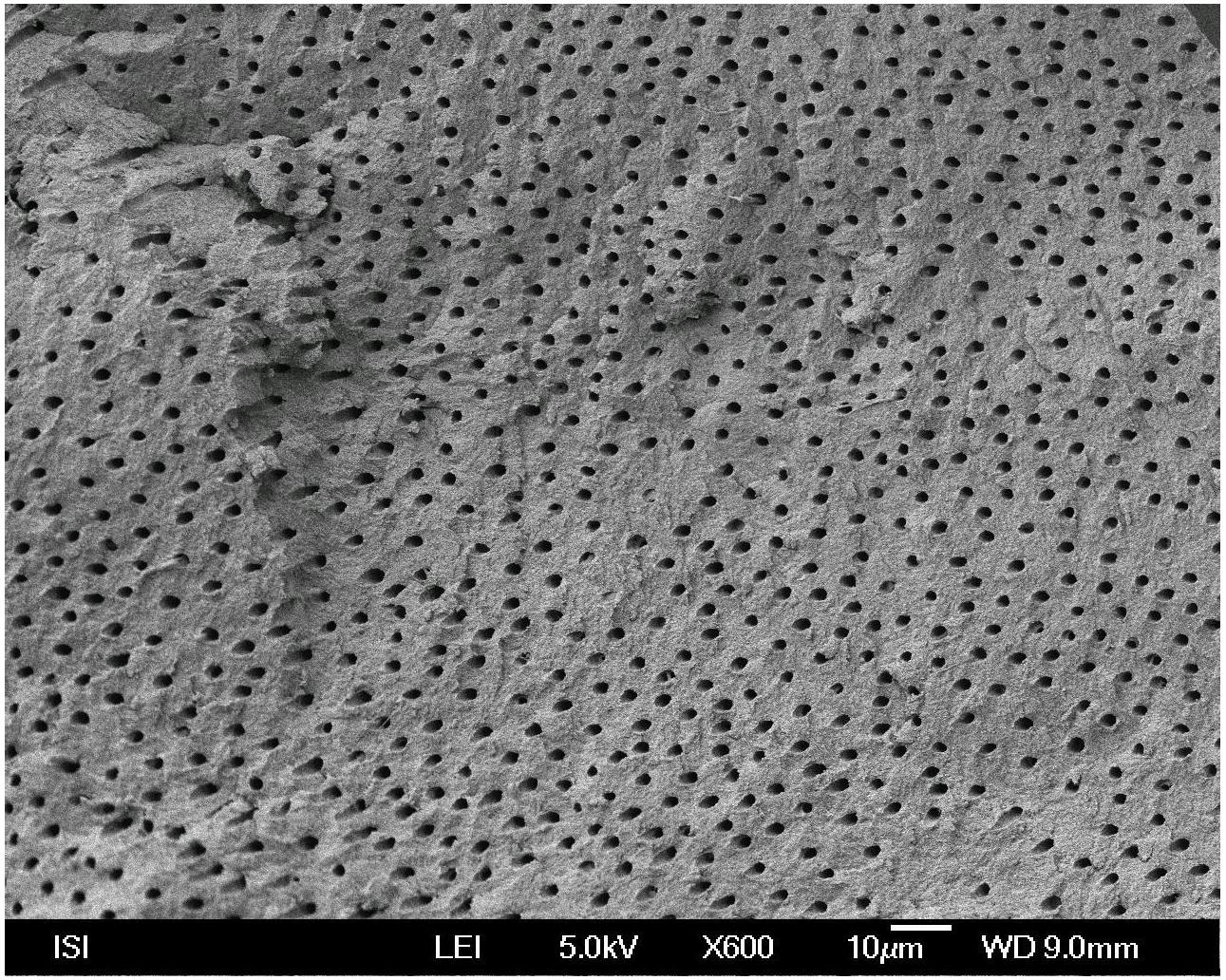
- **Decontamination**

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
10μm
WD 8.1mm


ISI
LEI
5.0kV
X600
10µm
WD 9.0mm

Irrigants

- Sodiumhypochlorite

  2 – 6%

- Oxidation a chloration
- Dissolving efect

- Bad smell, irritant.

Syringe and cannula

- B
- N

Activation of irrigation

- Increased effectivity

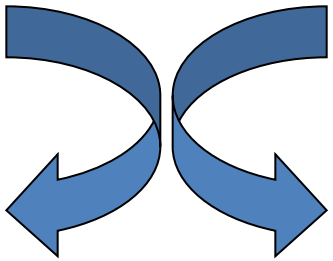
Vibration

Increasing of temperature

Decomposition of irrigants - dissociation

Shaping techniques

- Rotation – 45°

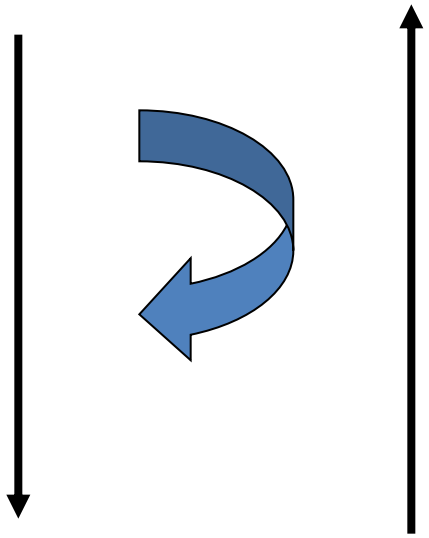


K – reamer

K- file

Shaping techniques

- Rotace 45° pressure and pull motion



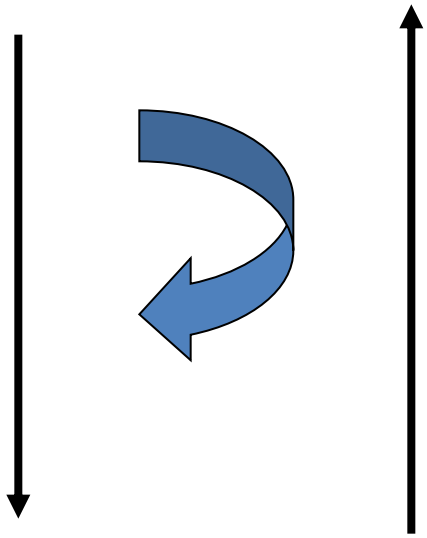
K – reamer

K- file

Risk of ledging
Zip, elbow effect
Via falsa

Shaping techniques

- Filing



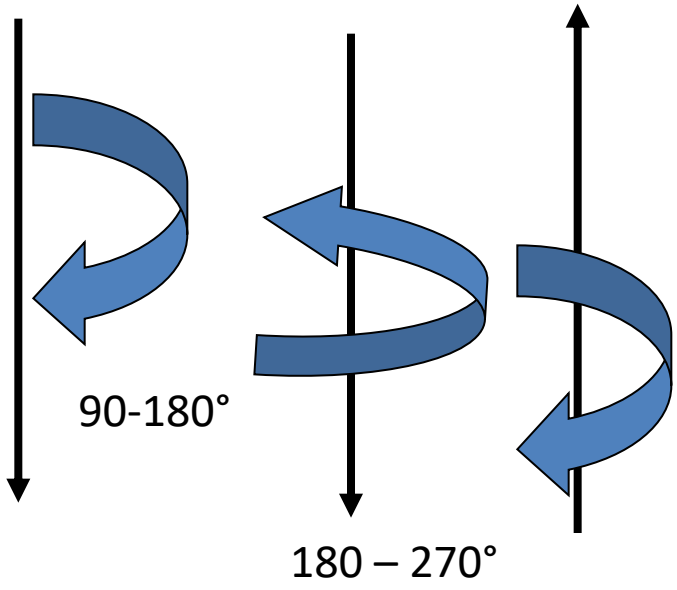
H- file

K – file

Risk of periapical infection infection
Risk of plug

Shaping techniques

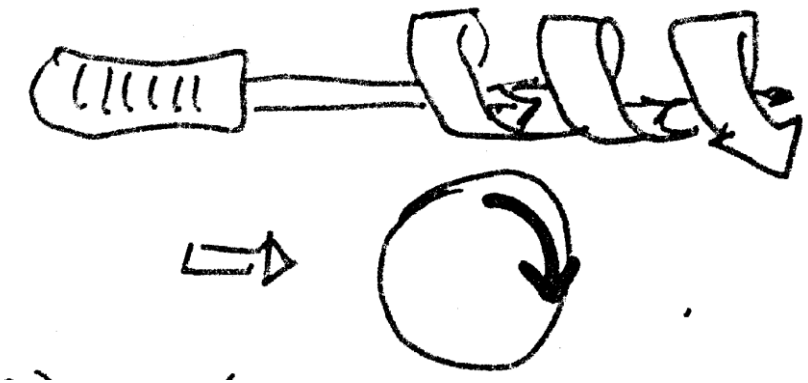
- Balanced force



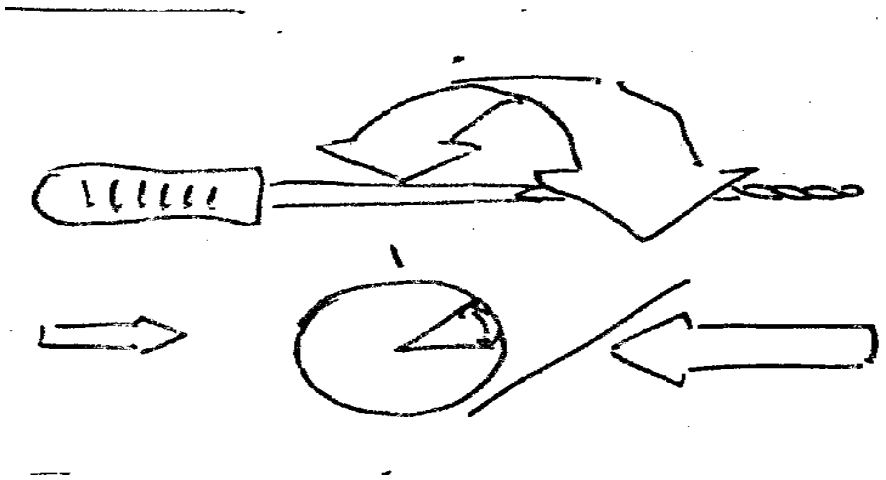
K- flexofile

K – file (?)

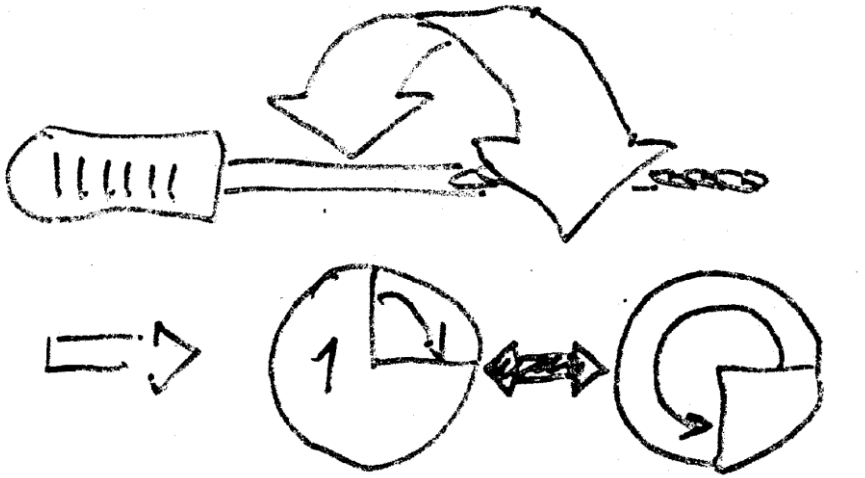
Reaming



Filing



Balance forced technique



Methods of shaping

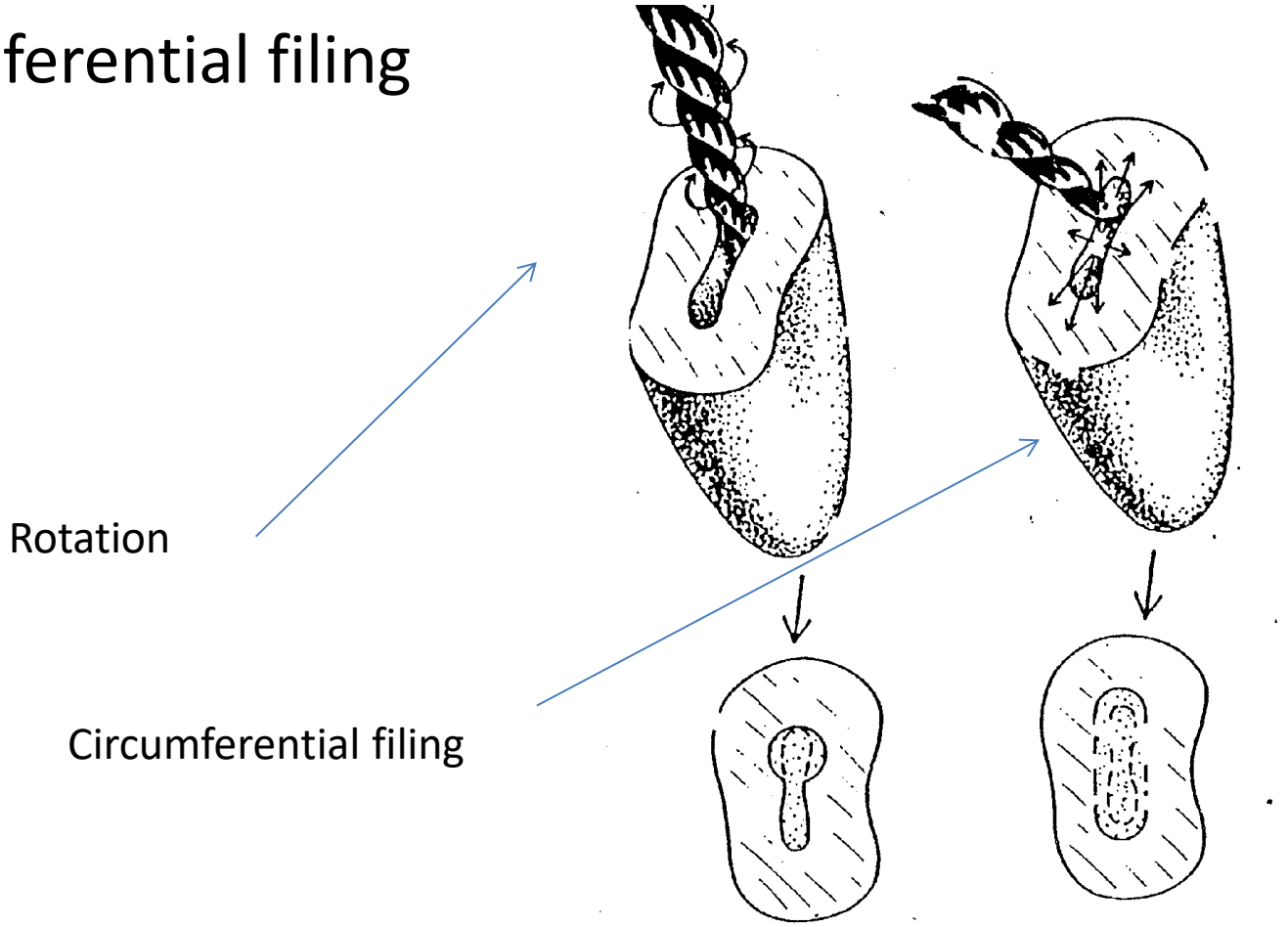
- Rotation and filing combined

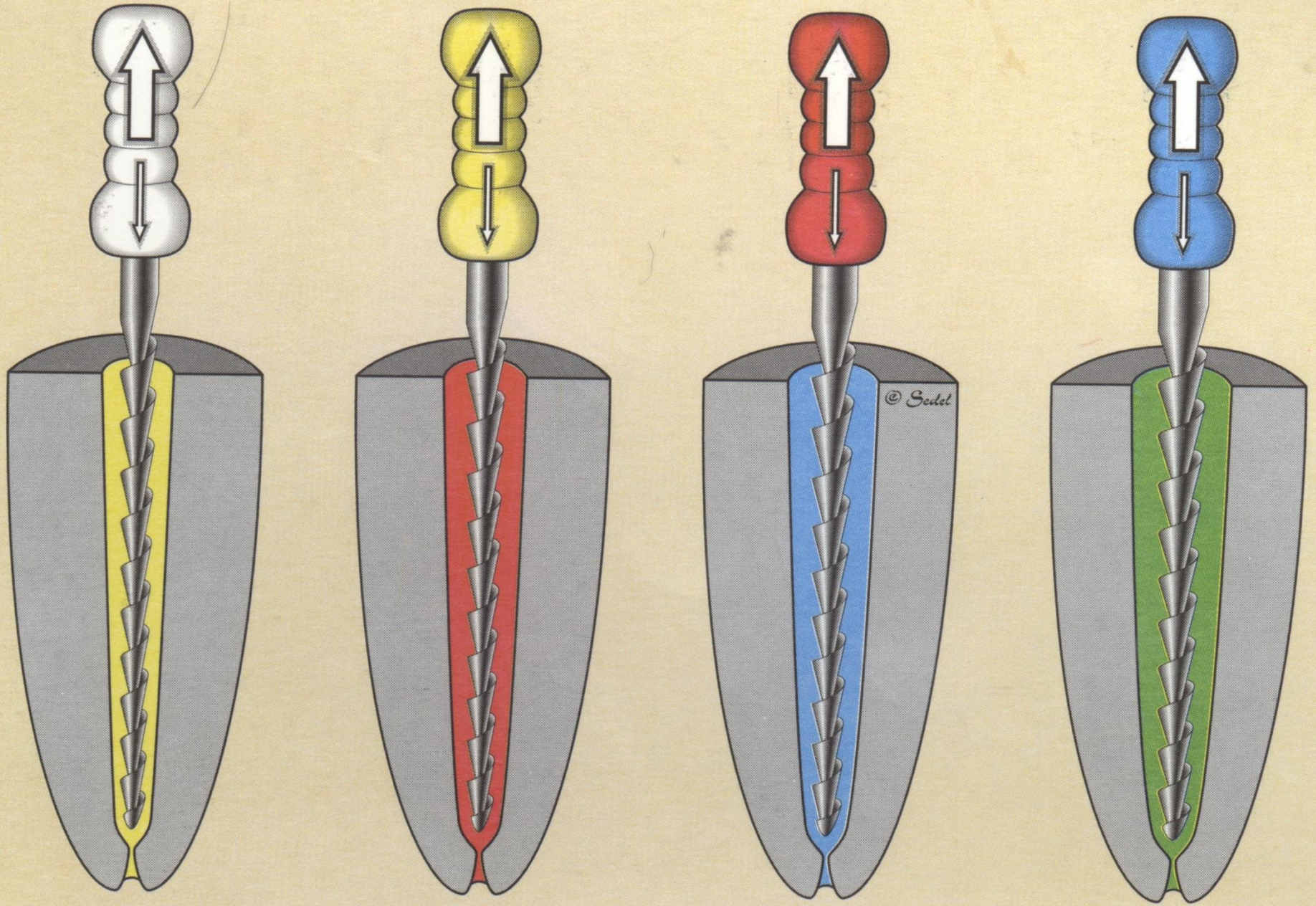
K - reamer

H- file

Methods of shaping

- Circumferential filing





Dr. Sedlmayer

Methods of shaping

- Combination of rotation and filing

Start with rotation

Finishing with filing

Suitable for straihgt root canals

Methods of shaping

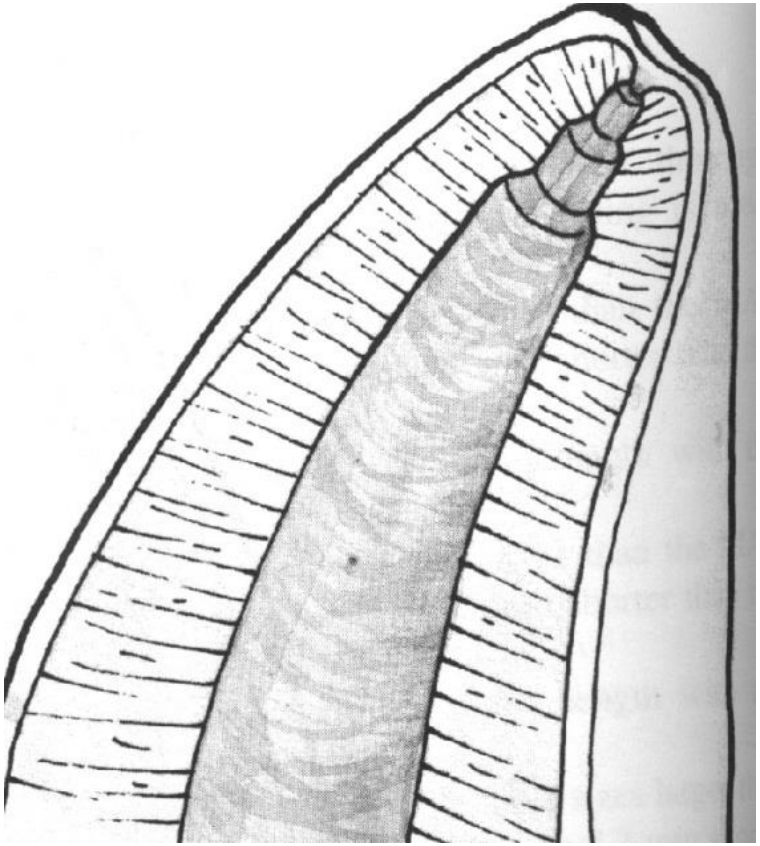
- Step back method

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 flaerd

- 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)