Root canal treatment

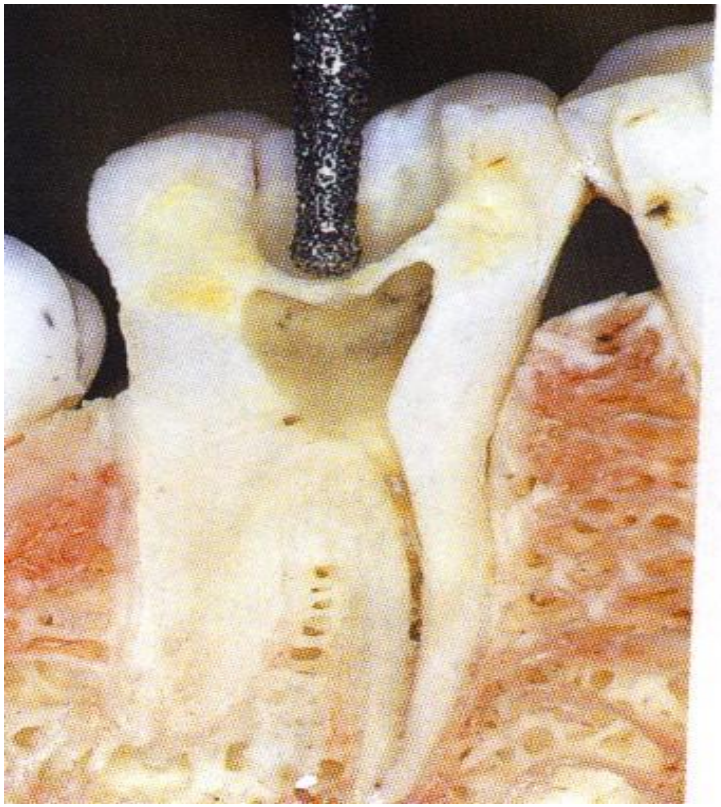
Phases of the endodontic treatment

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

Phases of the endodontic treatment

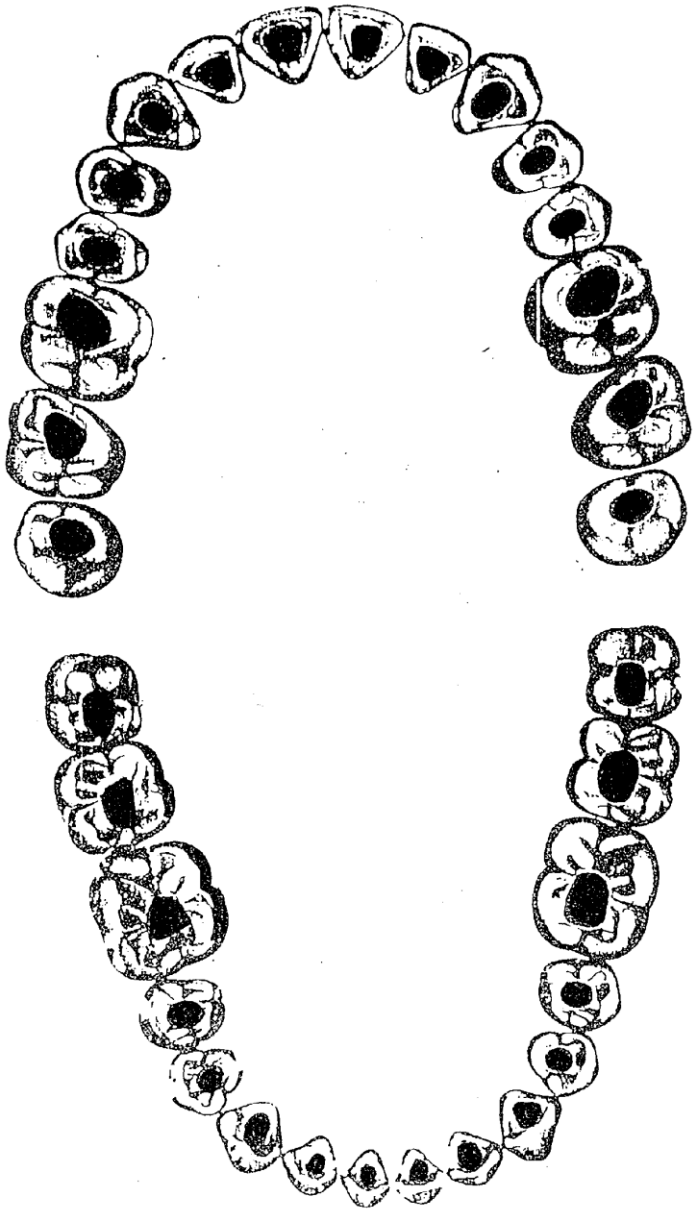
- Opening of root canals
- Initial flaring and removal dental pulp or necrotic materiál from the root canal
- WL (working length)
- Root canal shaping and cleaning (irrigation)
- Recapitulation
- Drying
- Filling
- Radiogram
- Postendodontic treatment

Access opening

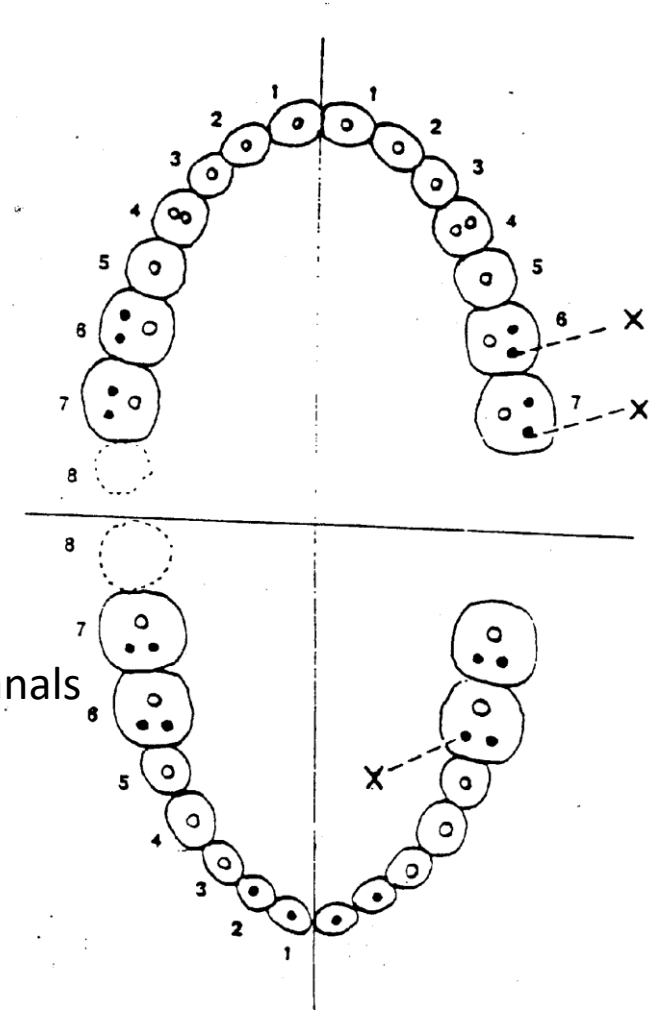


Shapes of endo cavities

See special material on is



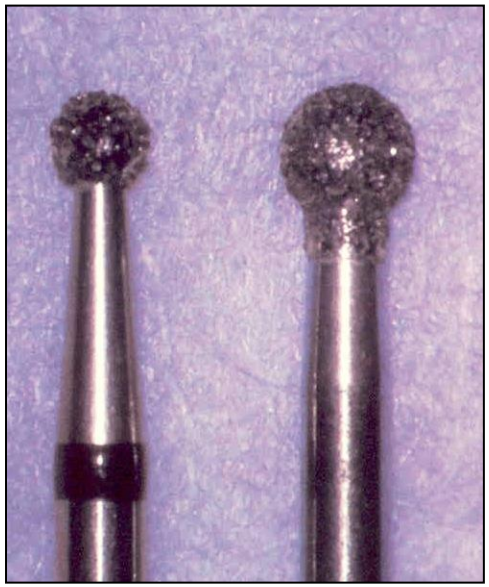
Number of root canals



Maxillary molars have usually 4 root canals
Mandibulary molars hace 3, 4b or 2 root canals

Opening of the pulp chamber Access

Dia trepan



Dia round burs – balls

Tungsten carbide round burs

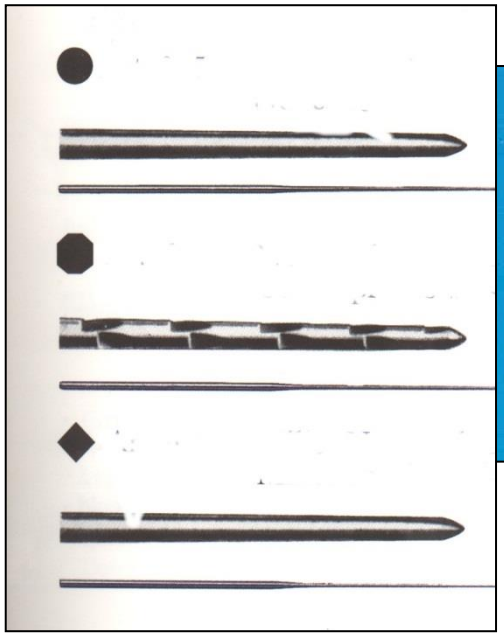
Preparation of the endodontic cavity

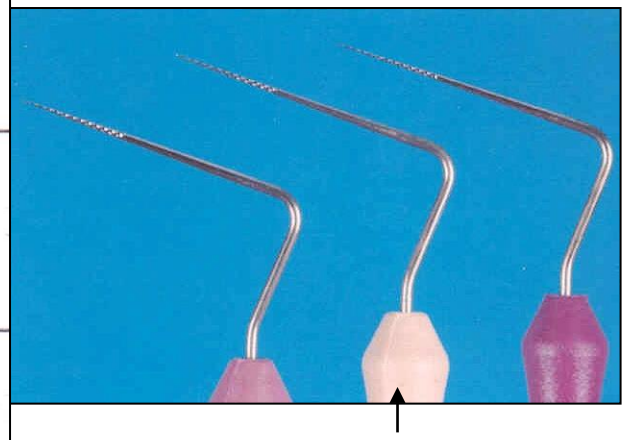
Dia trepan

Safe ended tips
Batt´s instruments

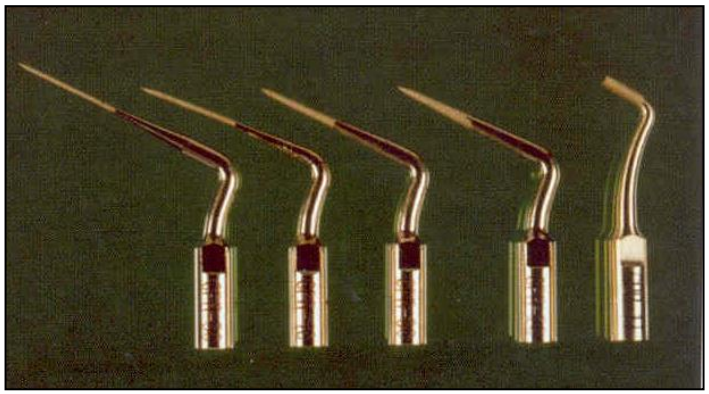
Fissur bur

Finding and opening of root canal orifices





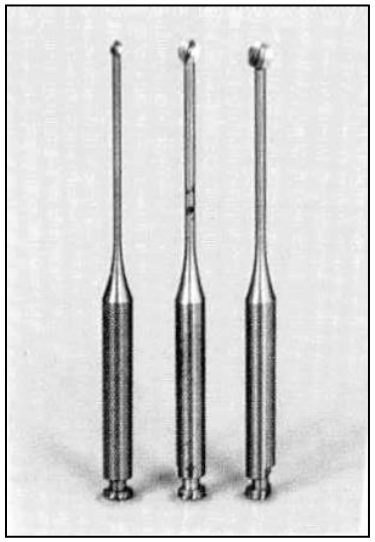
Endodontic probes
Microopeners



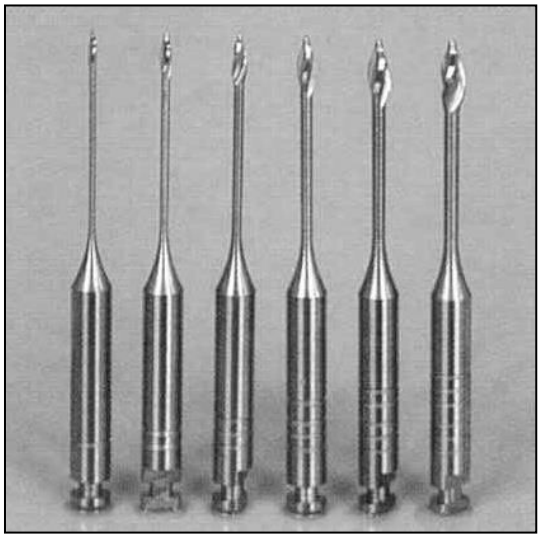
Ultrasound tips

Opening of root canals

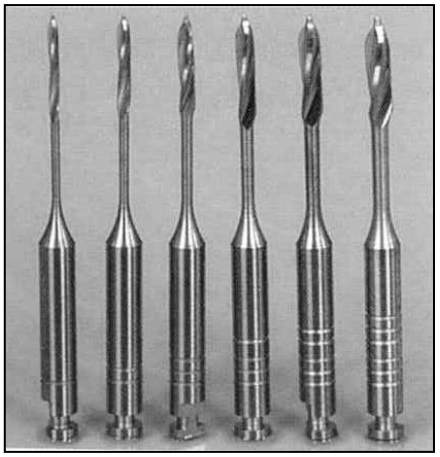
Ball burs



Miller‘s burs



Gates Glidden‘s burs

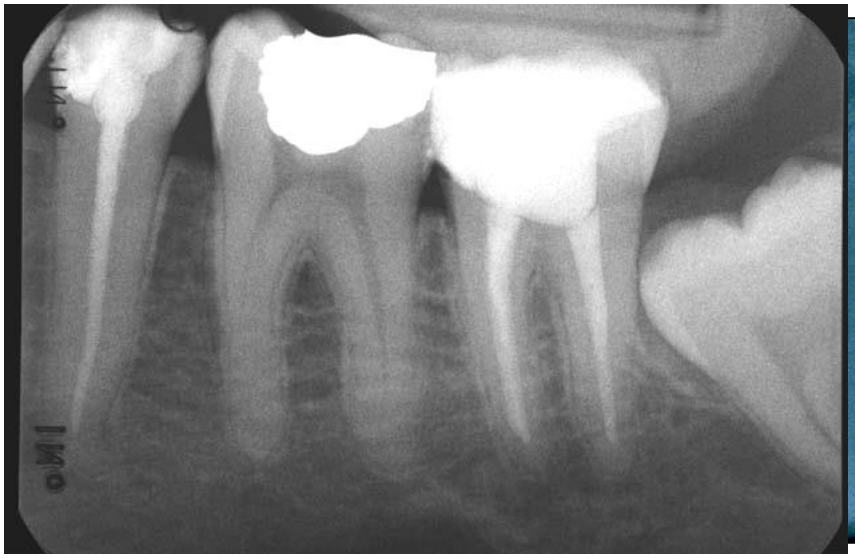


Peeso – Largo


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

Access kits

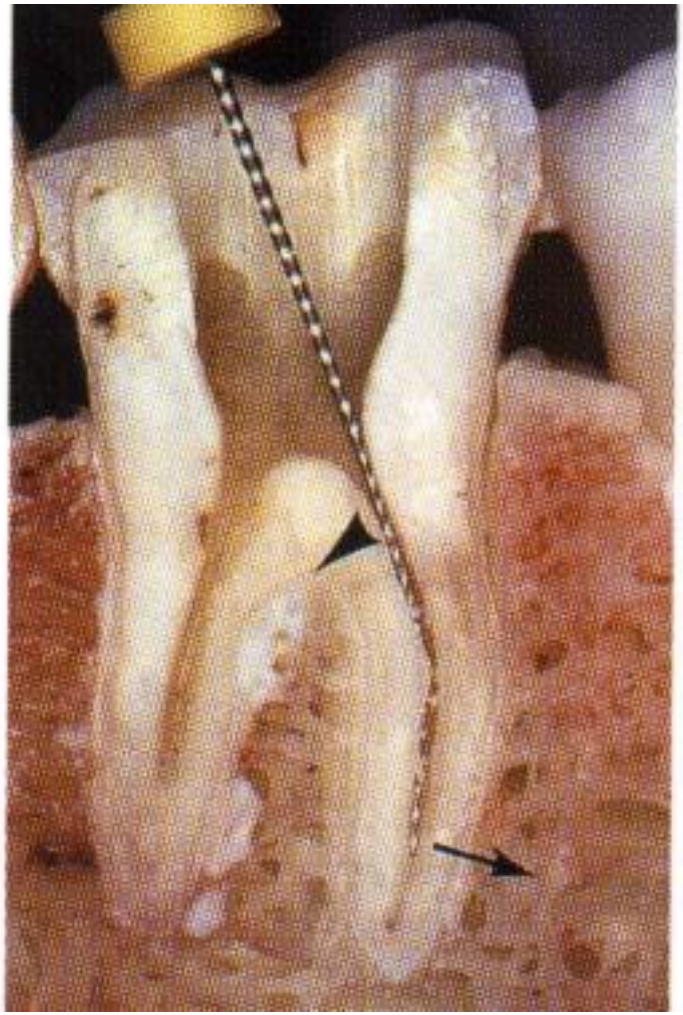

DENTSPLY
MAILLEFER
F 0001 016
E 0153 012
E 0123 010
E 0123 014
Endo Z
X-Gates

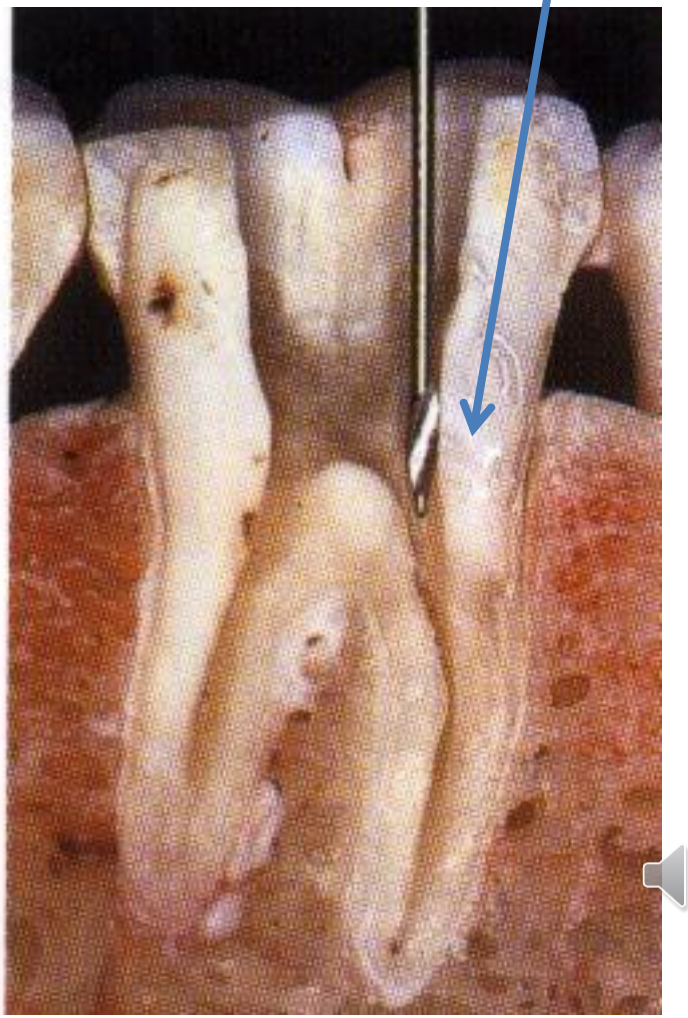


The wall is weakend

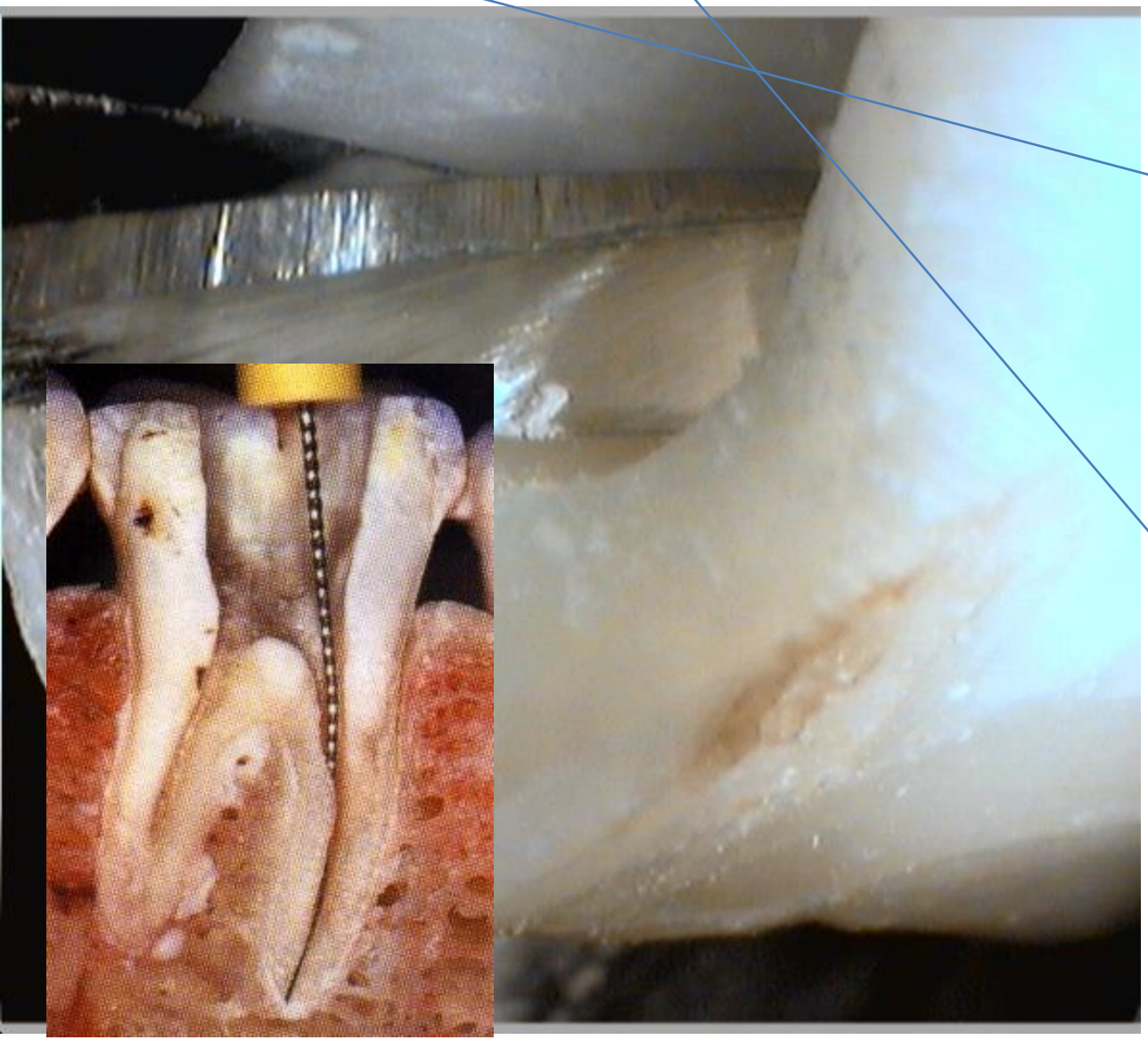
The pulp chamber correctly open

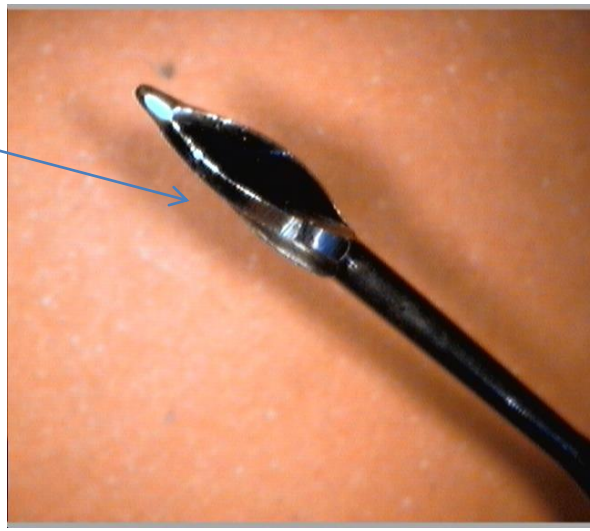
Opening of the root canal

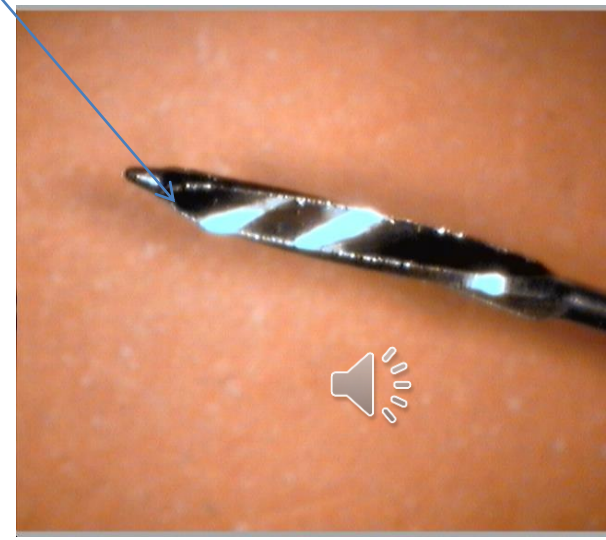




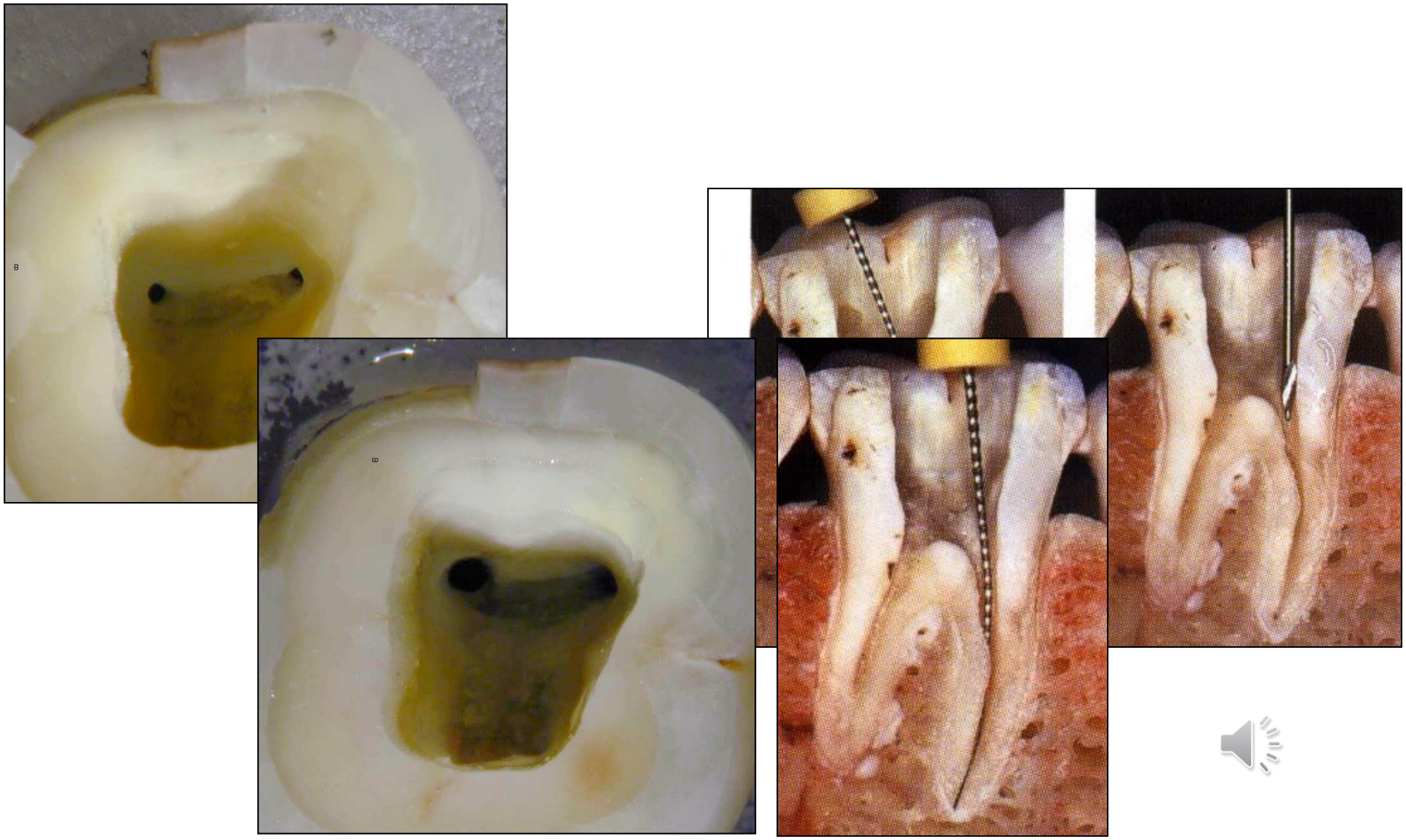
Gates Glidden, Peeso - Largo

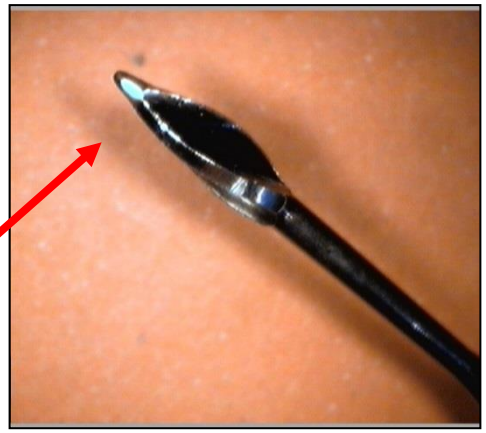




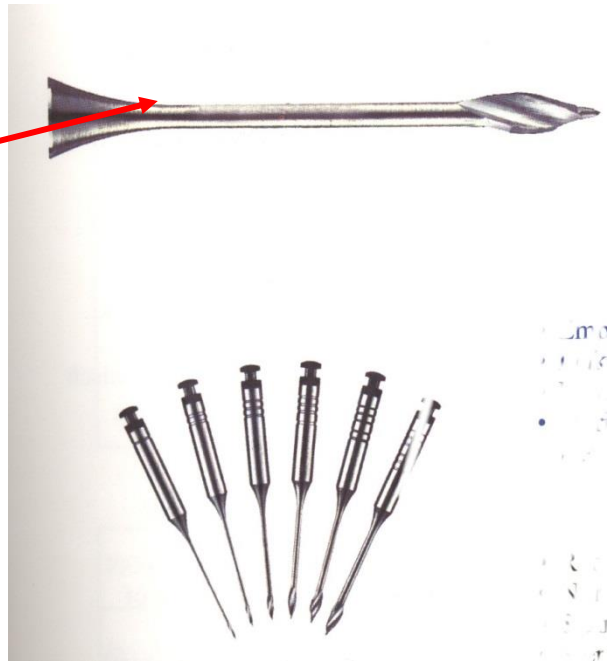


Finding of the root canal orifice

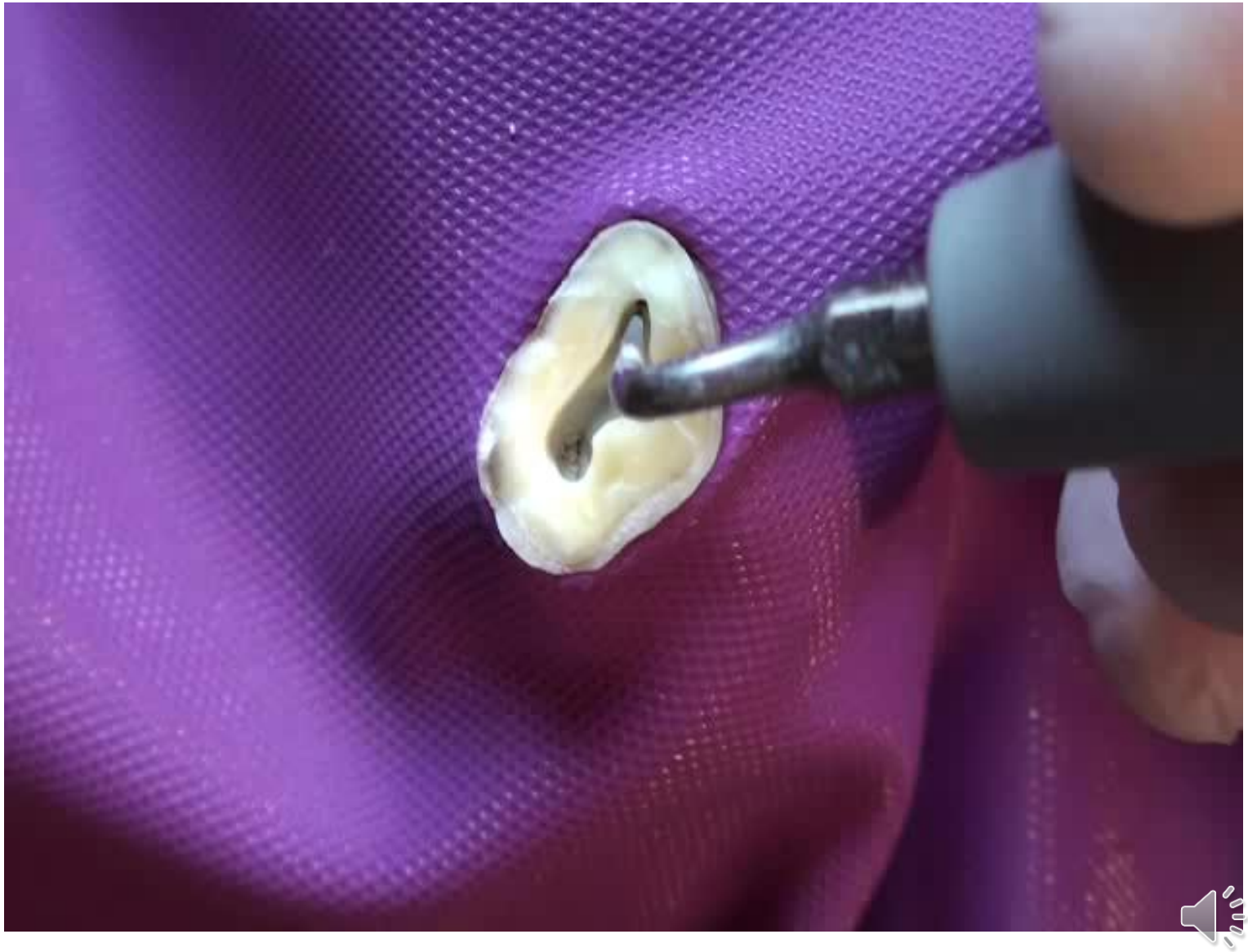




Gates – Glidden:
Blunt, non active tip

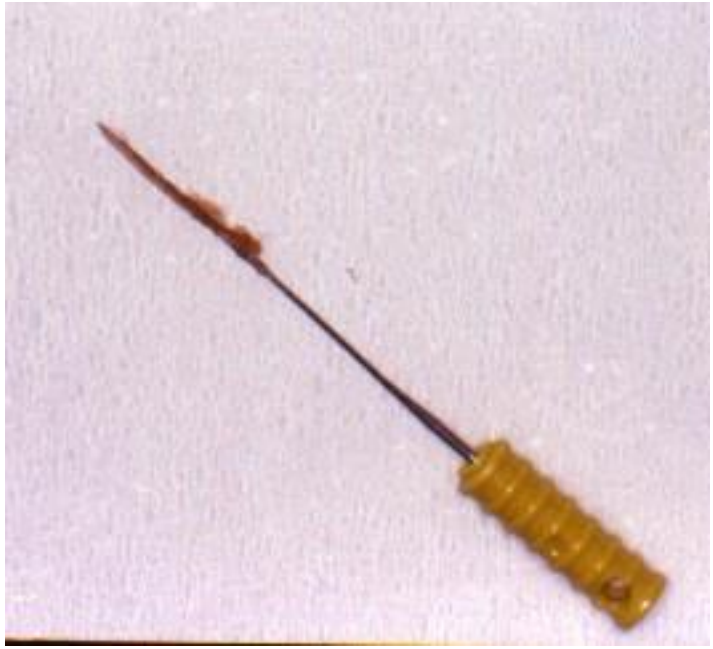


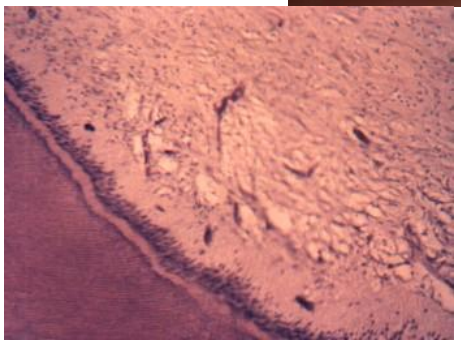
Programm point of breakage



Ultrasound

Pulpextractor





Soft wire
Prickles like harpune
Insertion
Rotation
Exstirpation

Canal shaping

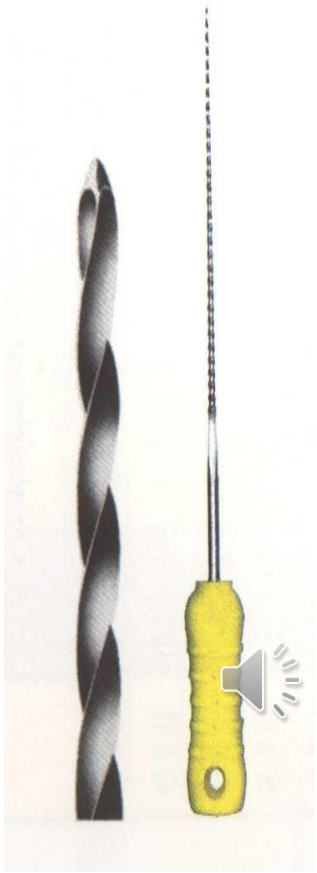
- Reamers (penetration)
- Files (shaping)

Reamer

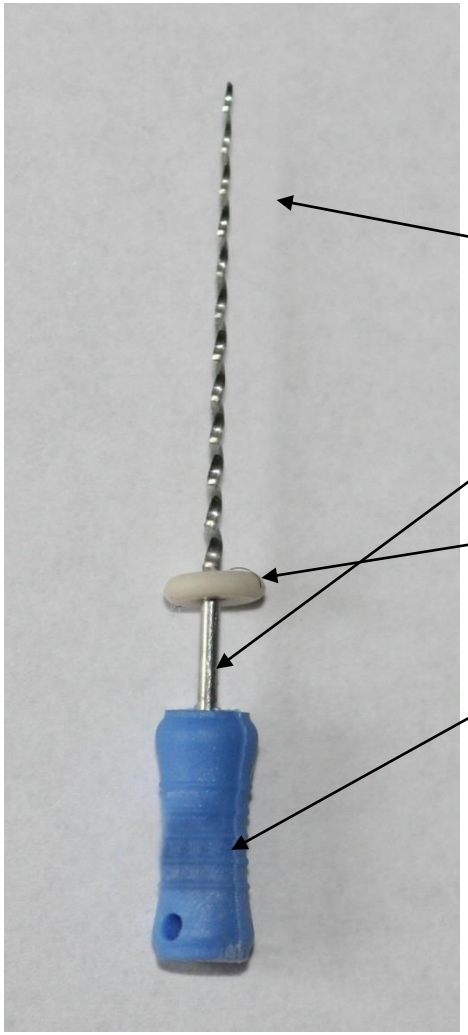
K -reamer

Triangl or square wire spun

Symbol



Reamer



Bladed part

Shank

Stopper

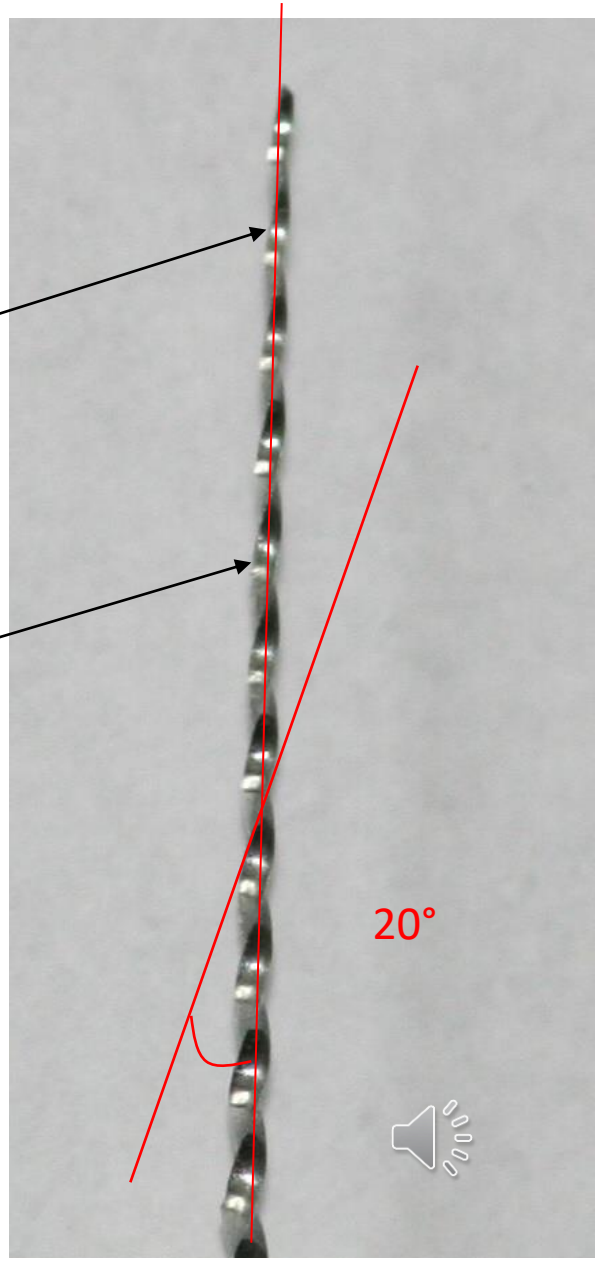
Grip

Reamer

Blades

Space for dentin chips

Rotation – reaming achtion - panetration



Reamer

Rotation (clockwise) – penetration

Application of plastic material (contraclockwise)

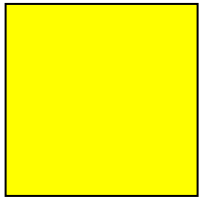
Files

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

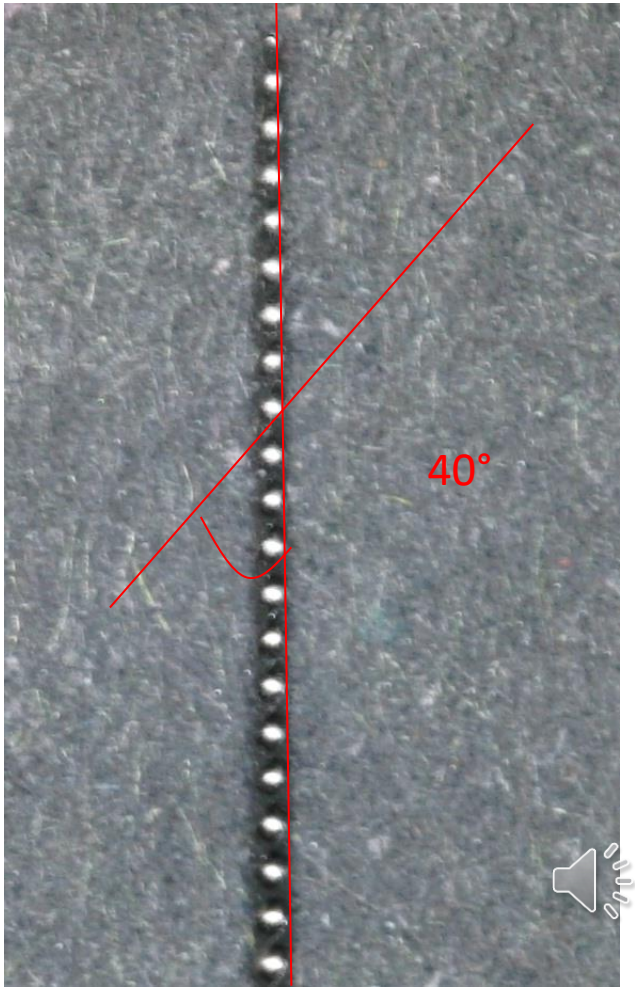


K-file

Filing

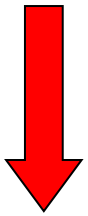
Also rotation

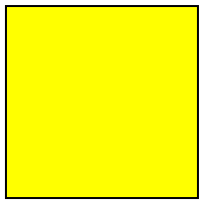
45° – 90°



K-flexofile, flexicut, flex-R

- Triangle wire always



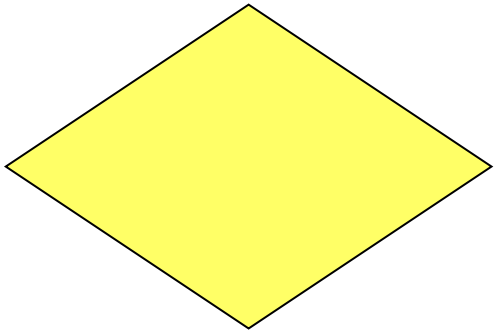


Flexibility

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: a difference

H-file

= Hedstroem file

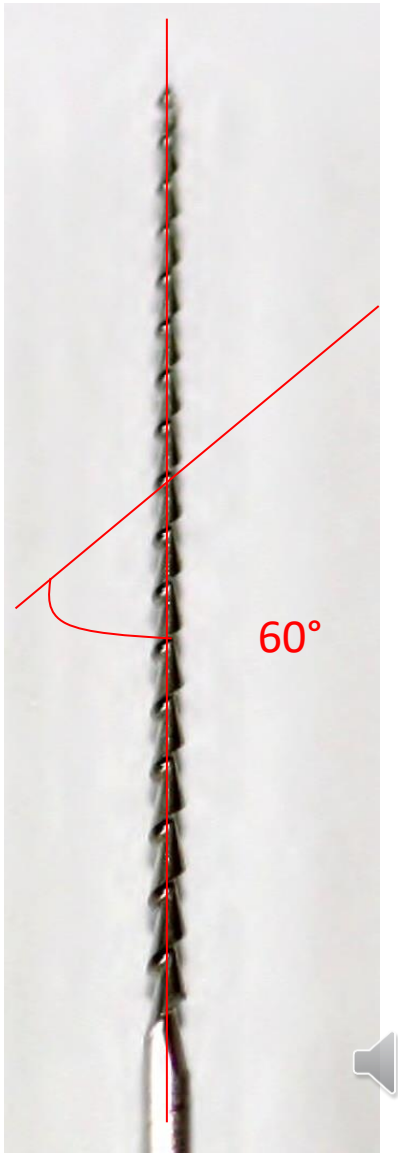
Ring

H- file

No rotation!!

Pull motion only!!

Risk of breakage in small sizes



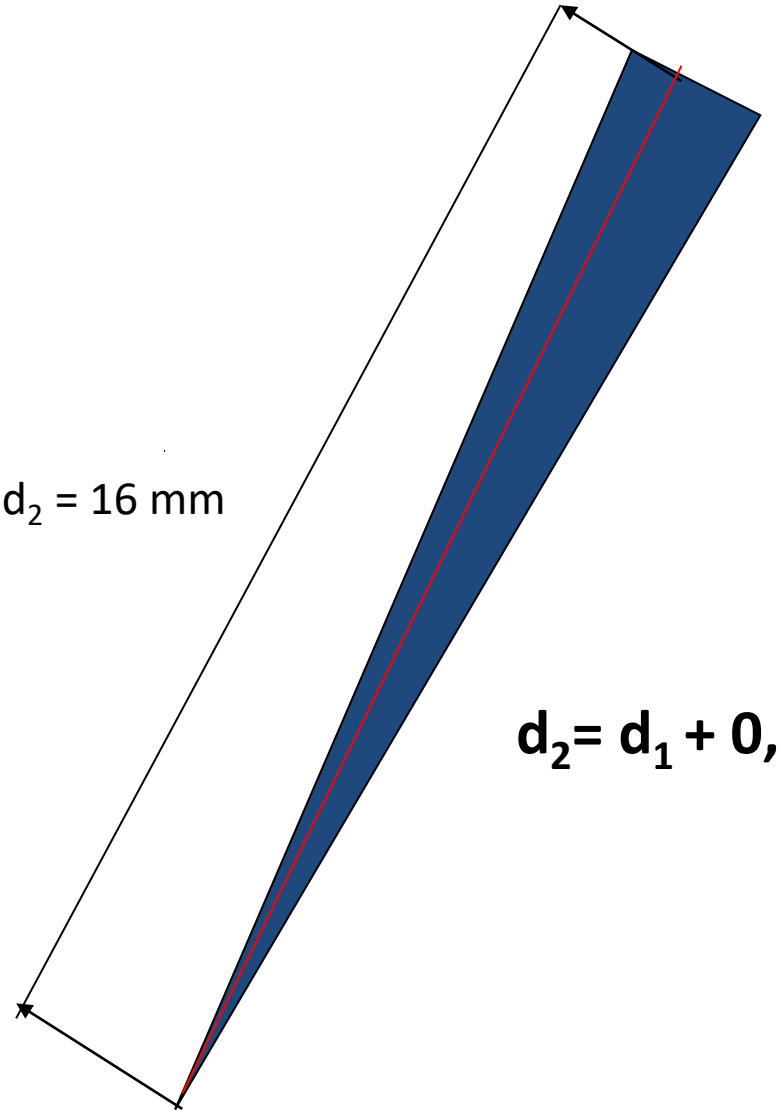
ISO

- 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

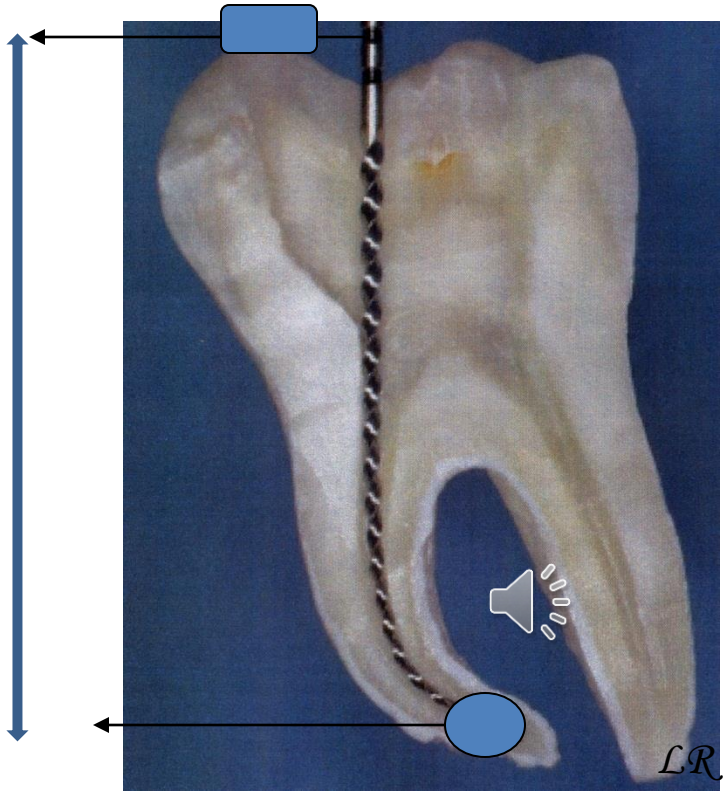
Taper 2%

0,02 mm na 1mm

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
- Godd condition for root canal filling

ℒℛ

Radiogram

X-ray with inserted root canal instrument

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

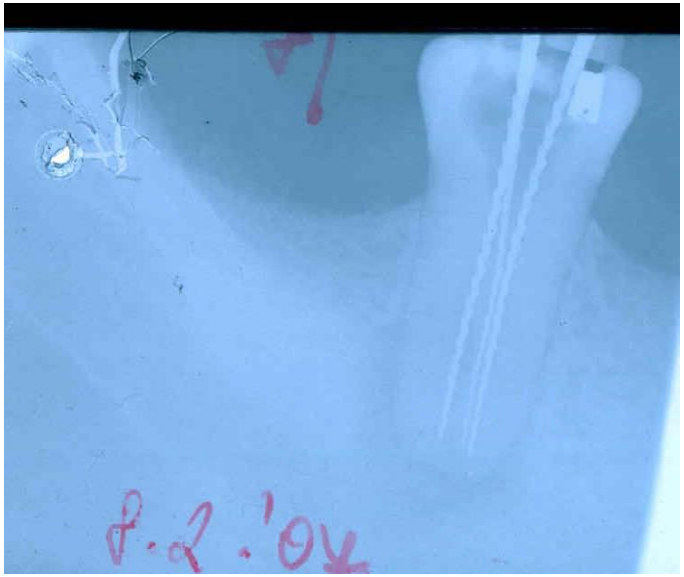
Tooth with clinical crown

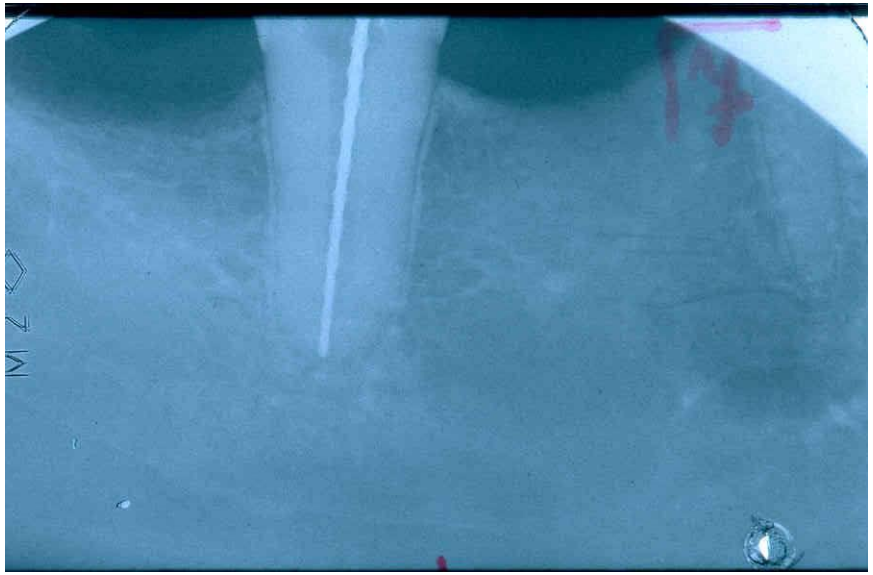
Procedure

- Instrument ISO 15 inserted 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 2 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

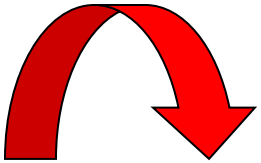
C20 -22

P18

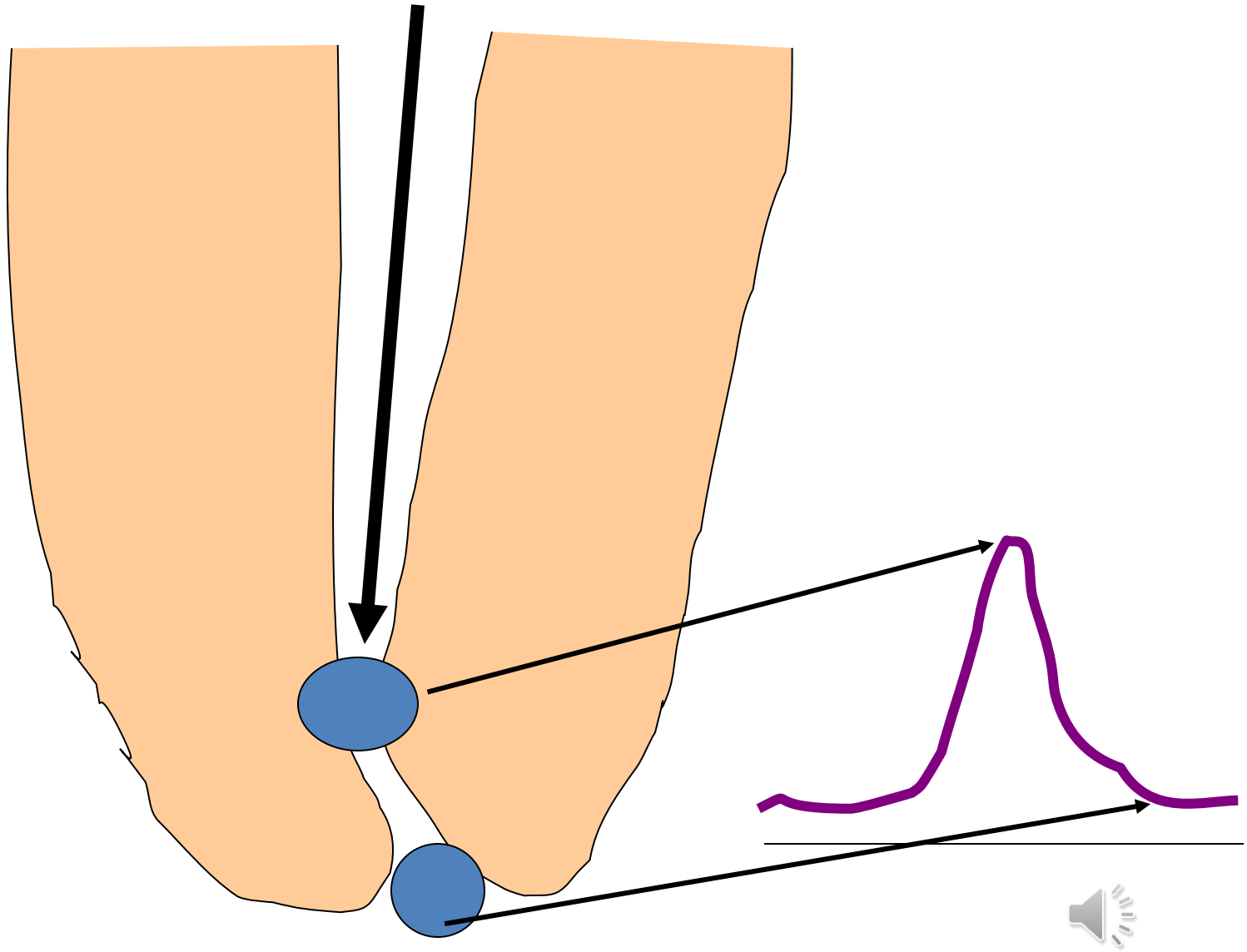
M18

Endometry, odontometry

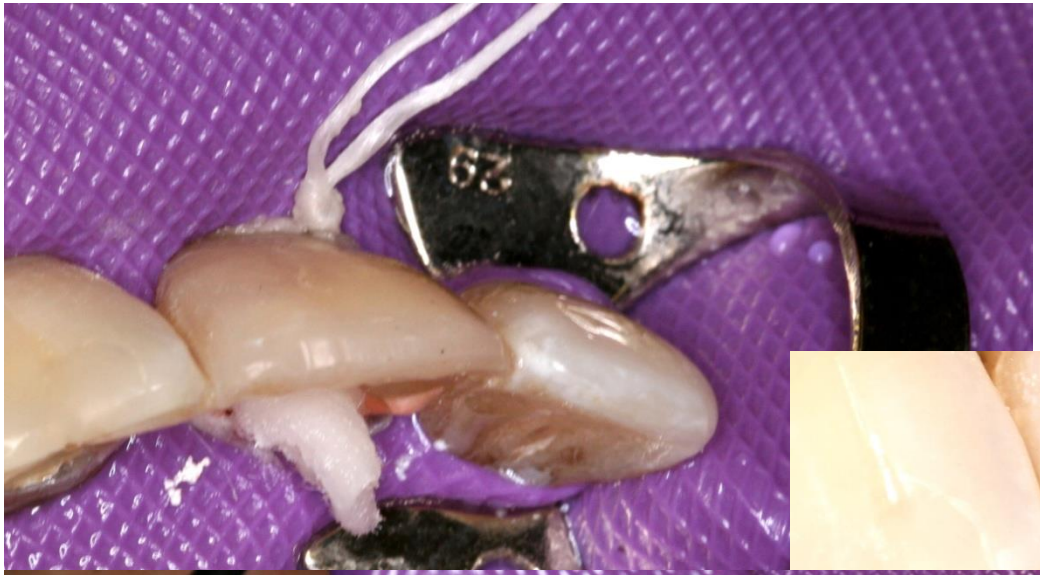
- Endometry

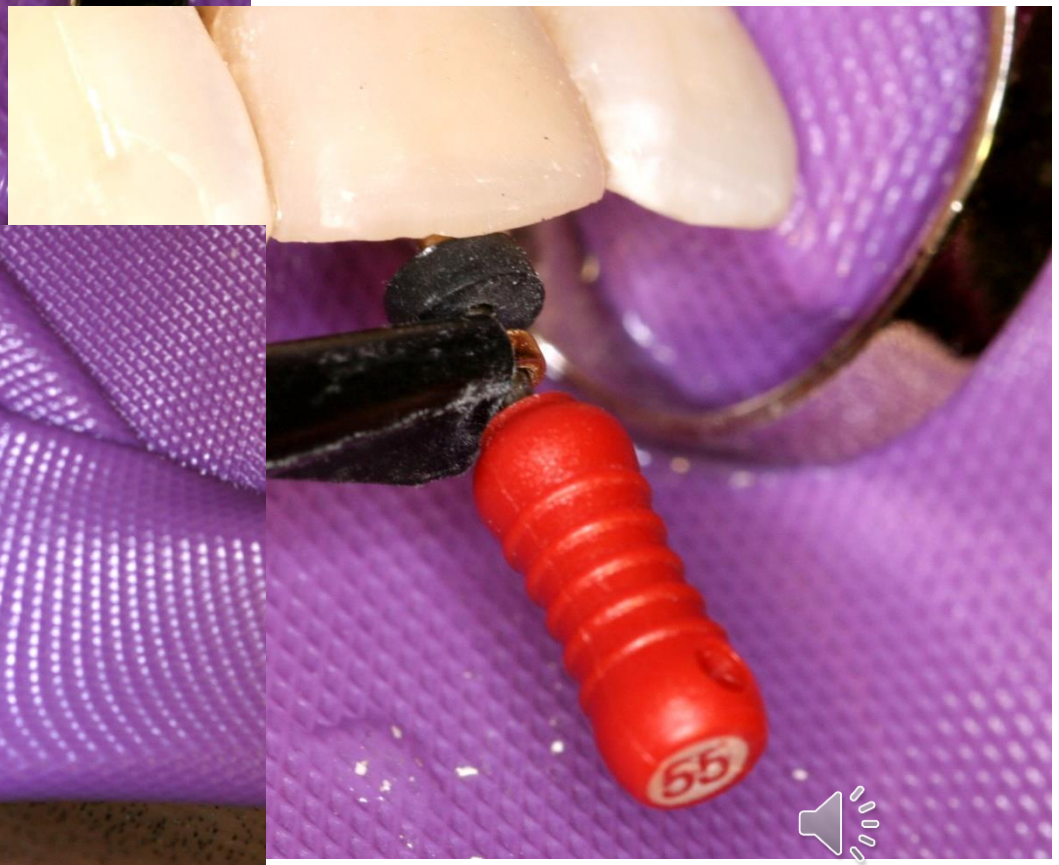


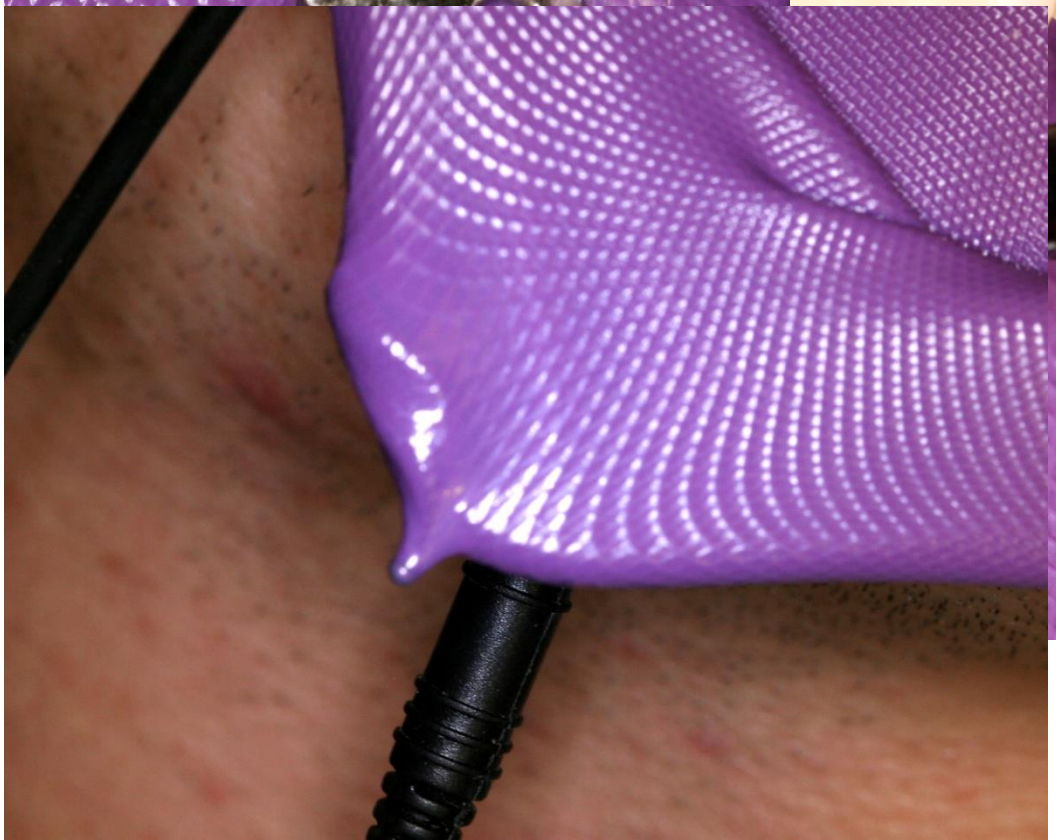
edevices based on measurement of electrical resistance



$\mathcal{LR}$



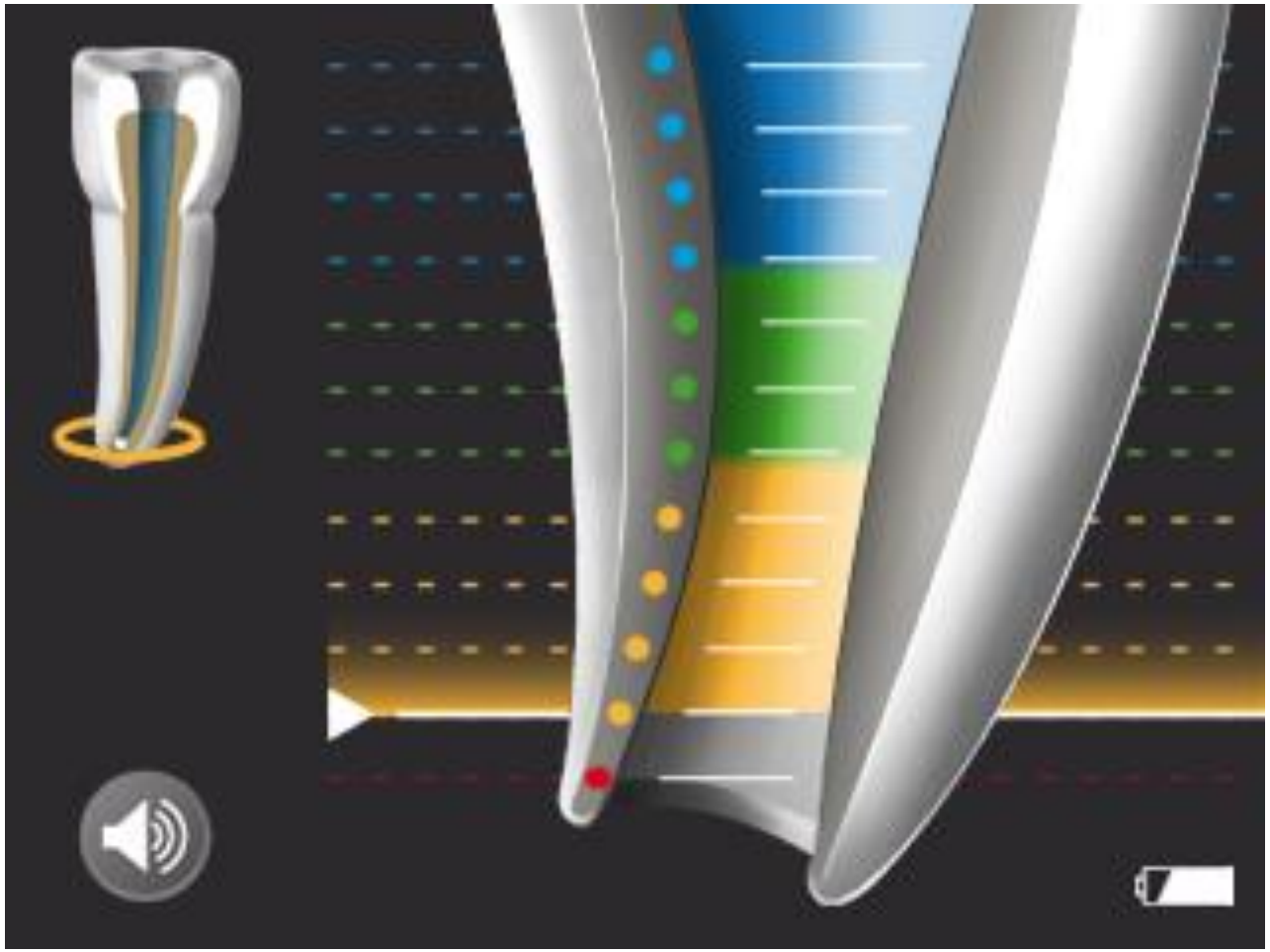




LR

RAYPEX® 6

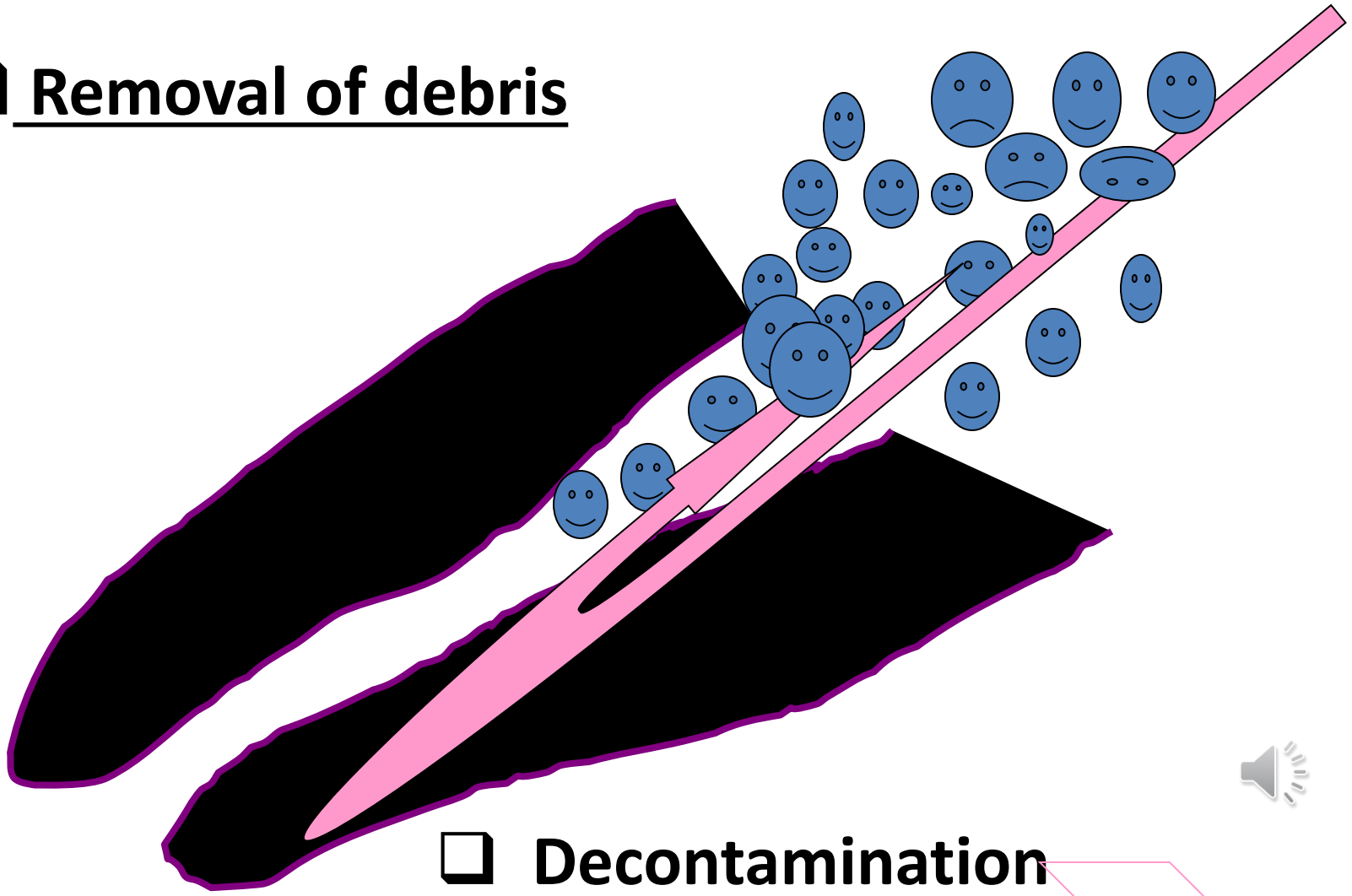
Apical zoom



4. Instrument im Interim-Stand reinigen.

Irrigation

- **Removal of debris**



- **Decontamination**

Irrigants

- **Sodium hypochlorite (1,5 – 6%)**
- **Chlorhexidin (0,12% - 0,2%)**
- **EDTA – etyléndiaminotetraacetic acid 17%**

Irrigants

- Sodiumhypochlorite

  1,5 – 6%

- Oxidation a chloration
- Dissolving efect

- Bad smell, irritant.

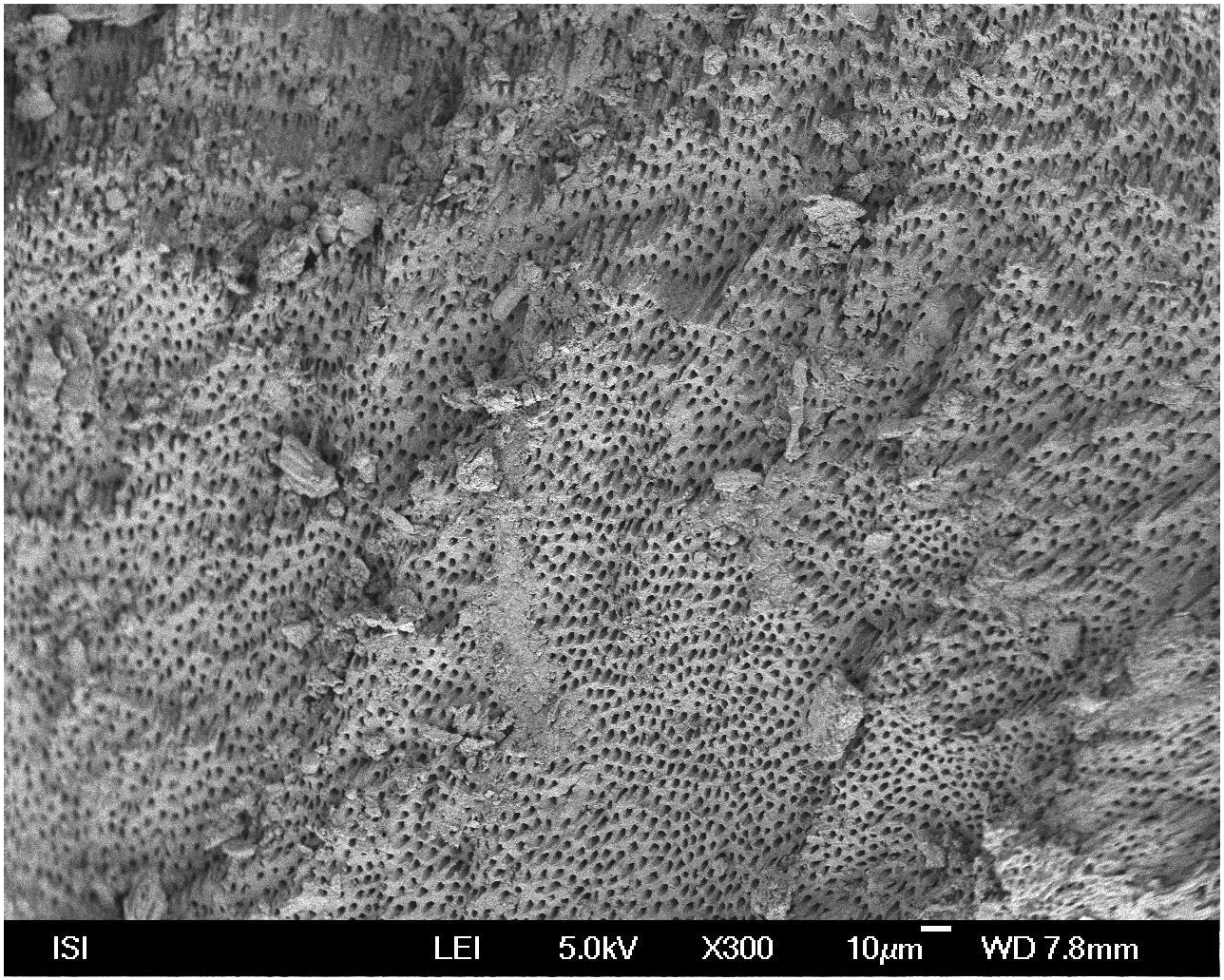
Irrigants

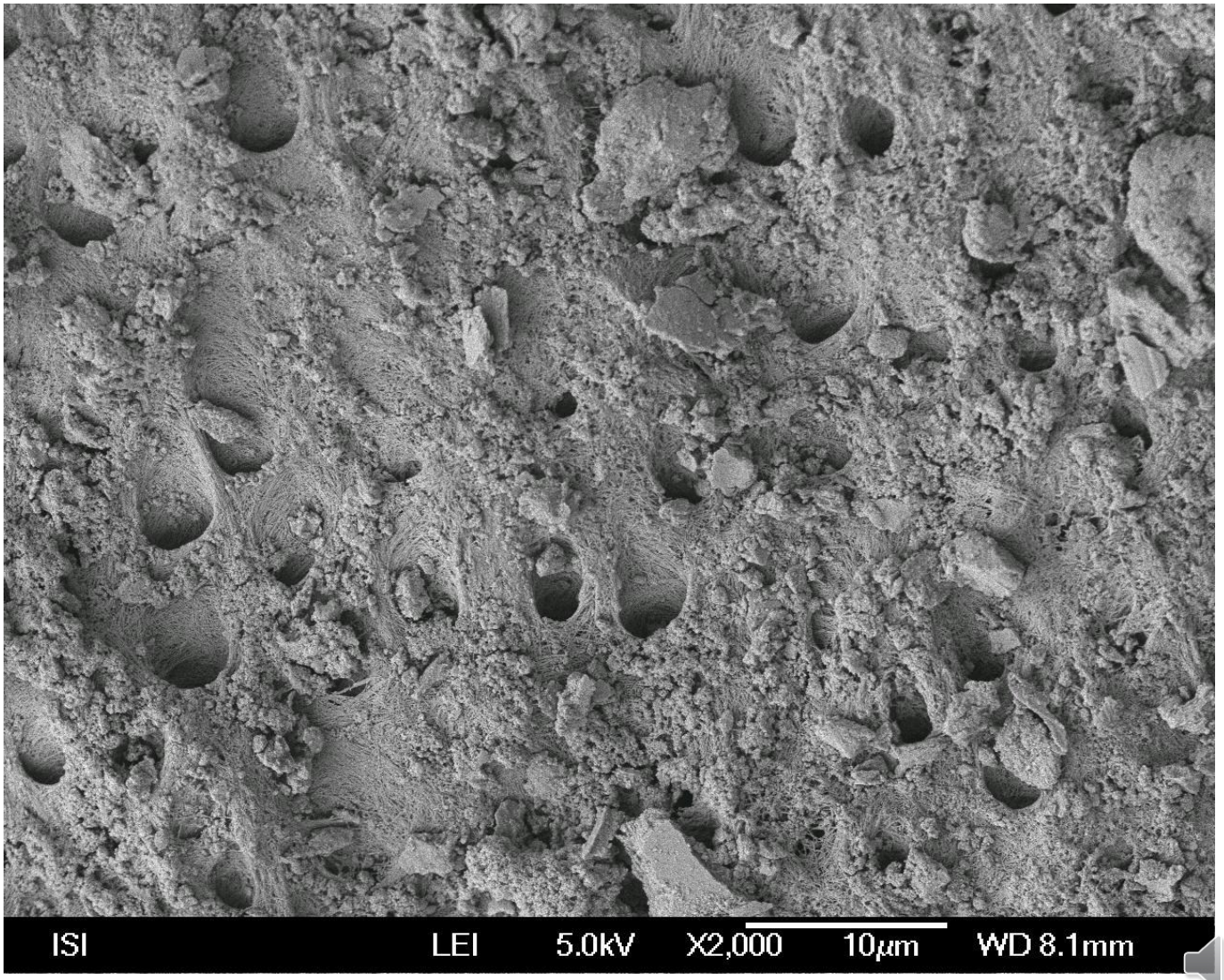
- **Chlorhexidin (0,12% - 0,2%)**

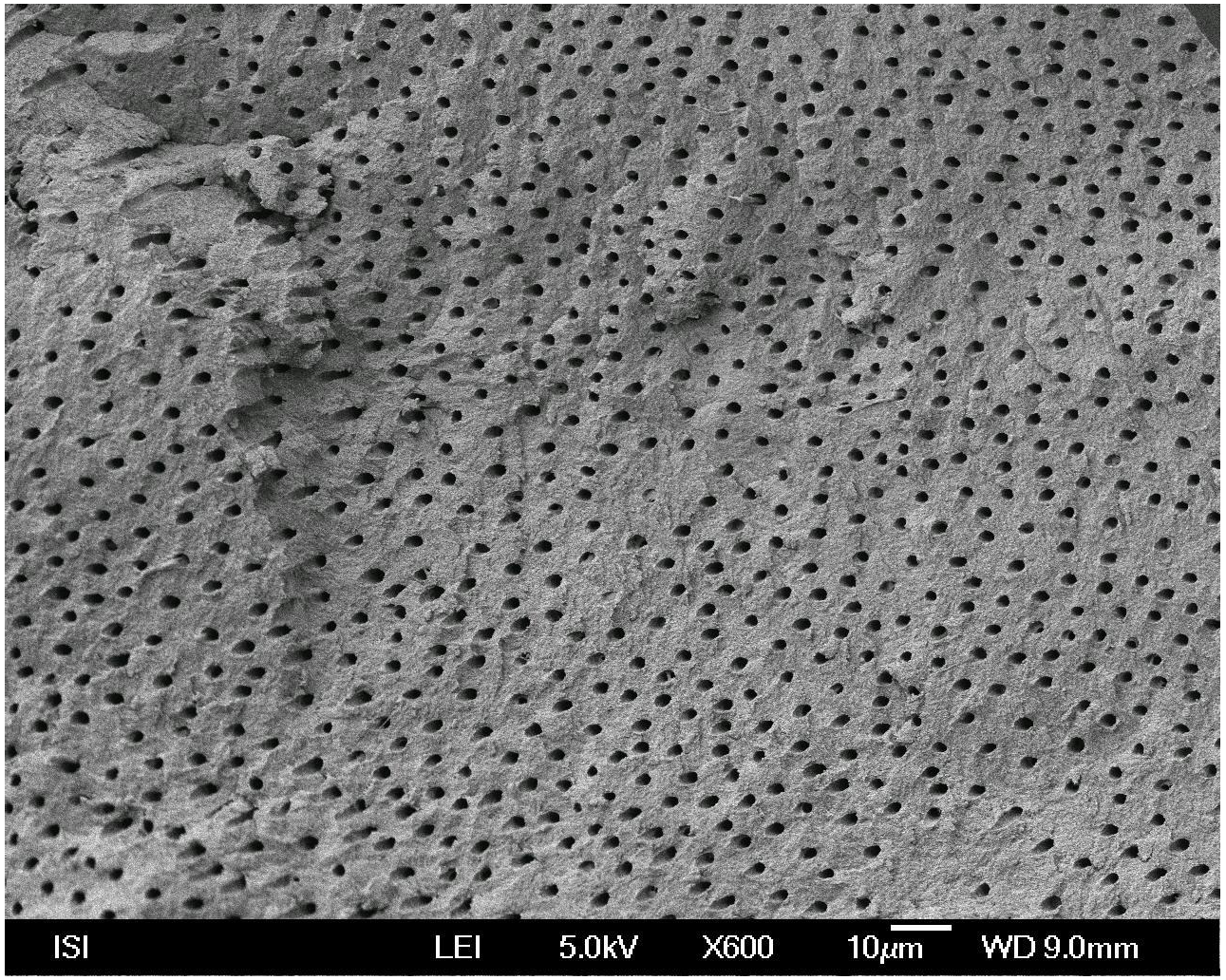
Good antimicrobial efect, but no dissolving effect

Irrigants

- **EDTA – etyléndiaminotetraacetic acid 17%**
- **Chelator, removes inorganic parts of smear layer, week antimicrobial effect**


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

Syringe and cannula

- Blunt, side apertures,smallest ISO 35

- No pressure

Activation of irrigation

- Increased effectivity

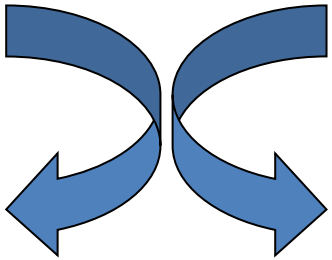
Vibration

Increasing of temperature

Decomposition of irrigants - dissociation

Shaping techniques

- Rotation – 45°

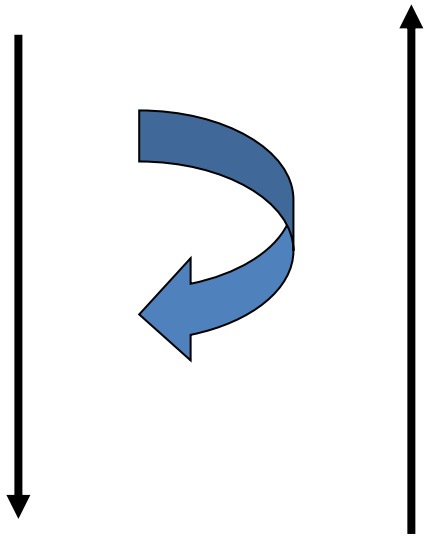


K – reamer

K- file

Shaping techniques

- Rotation 45° pressure and pull motion



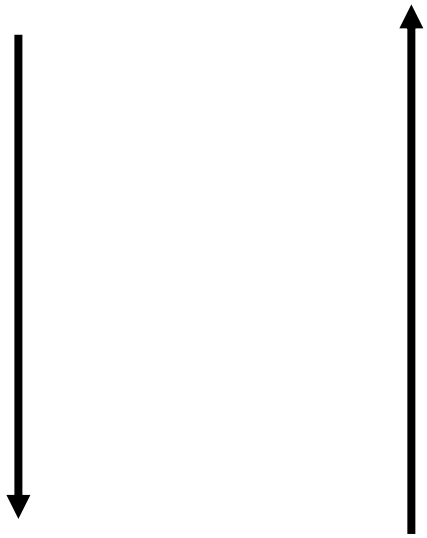
K – reamer

K- file

Risk of ledging
Zip, elbow effect
Via falsa

Shaping techniques

- Filing



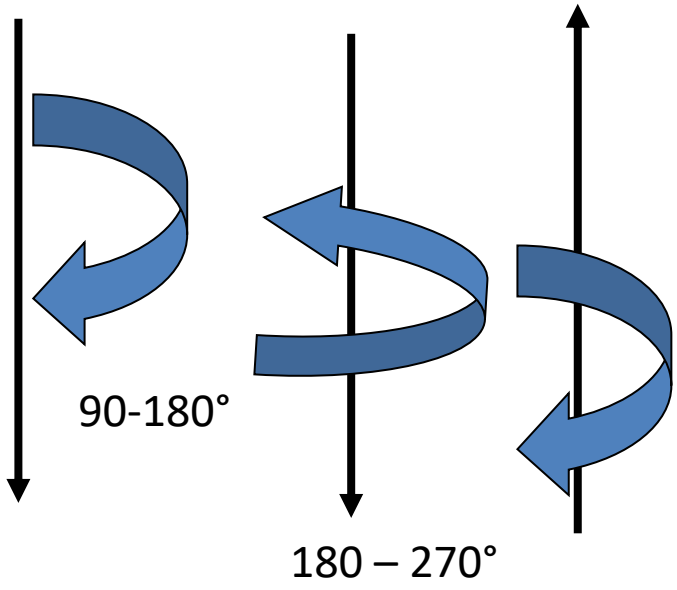
H- file

K – file

Risk of periapical infection infection
Risk of plug

Shaping techniques

- Balanced force



K- flexofile

K – file (?)

Methods of shaping

- Rotation and filing combined

K - reamer

H- file

Methods of shaping

- Combination of rotation and filing

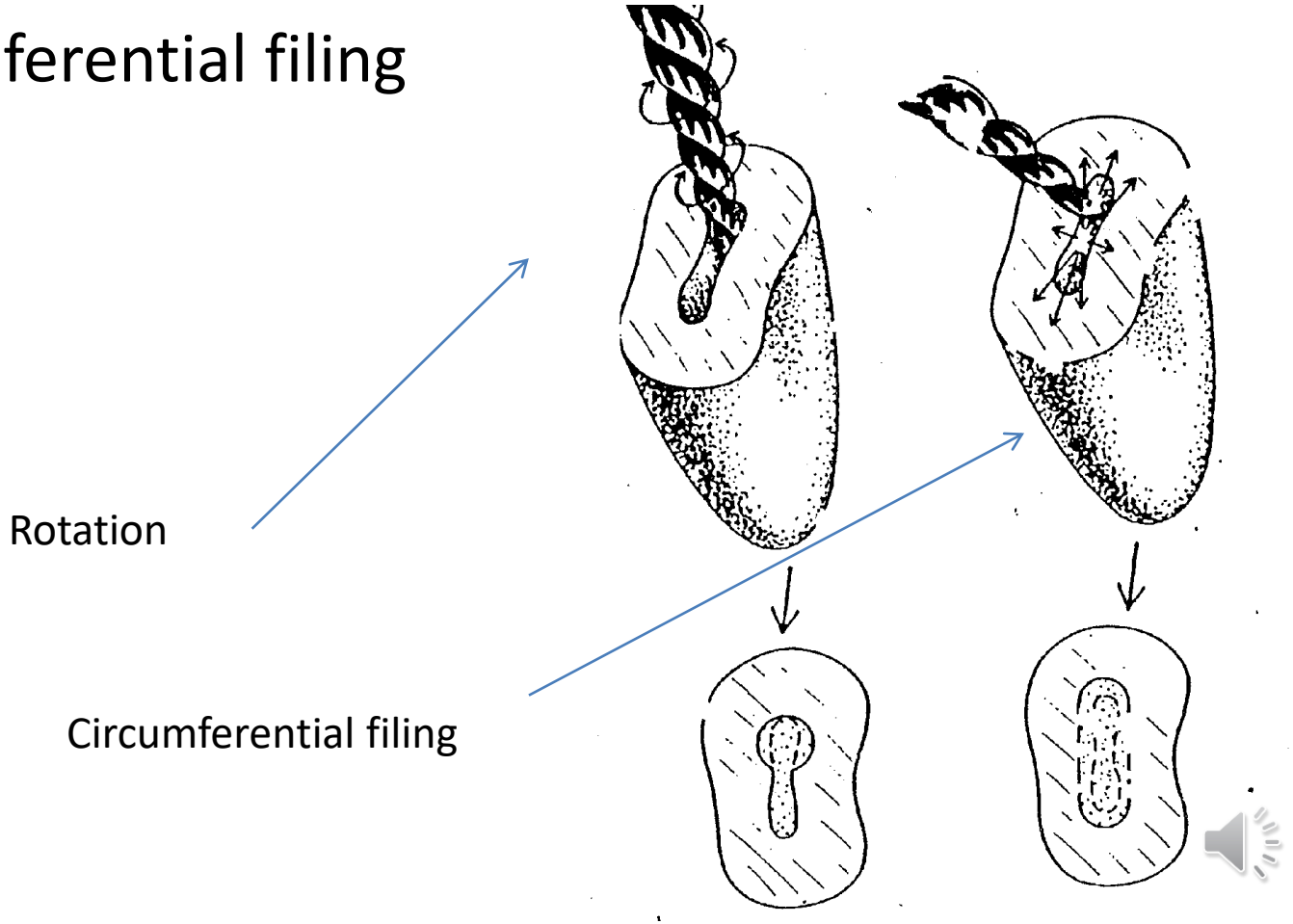
Start with rotation

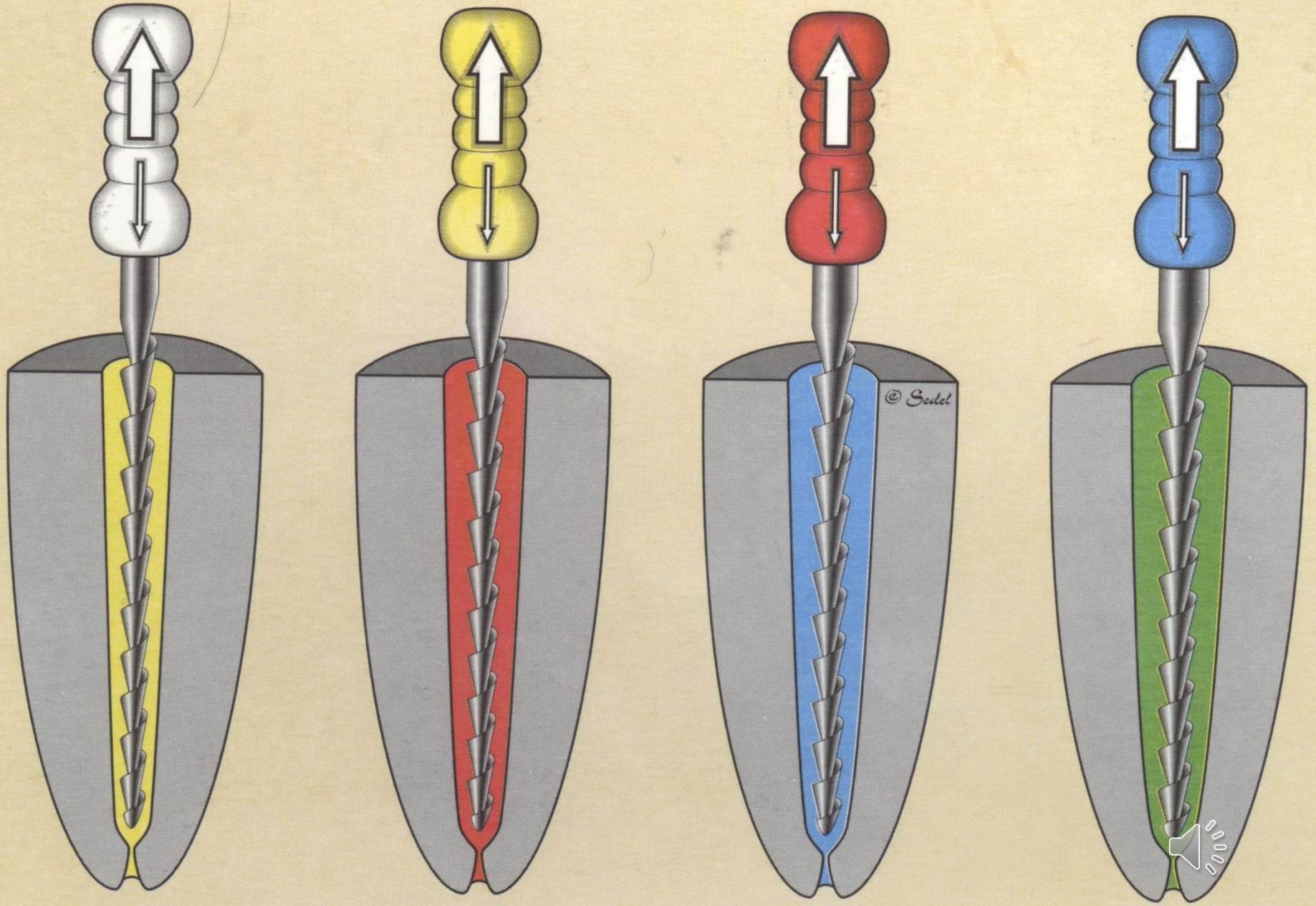
Finishing with filing

Suitable for straihgt root canals

Methods of shaping

- Circumferential filing





Dr. Sedlmayer

Methods of shaping

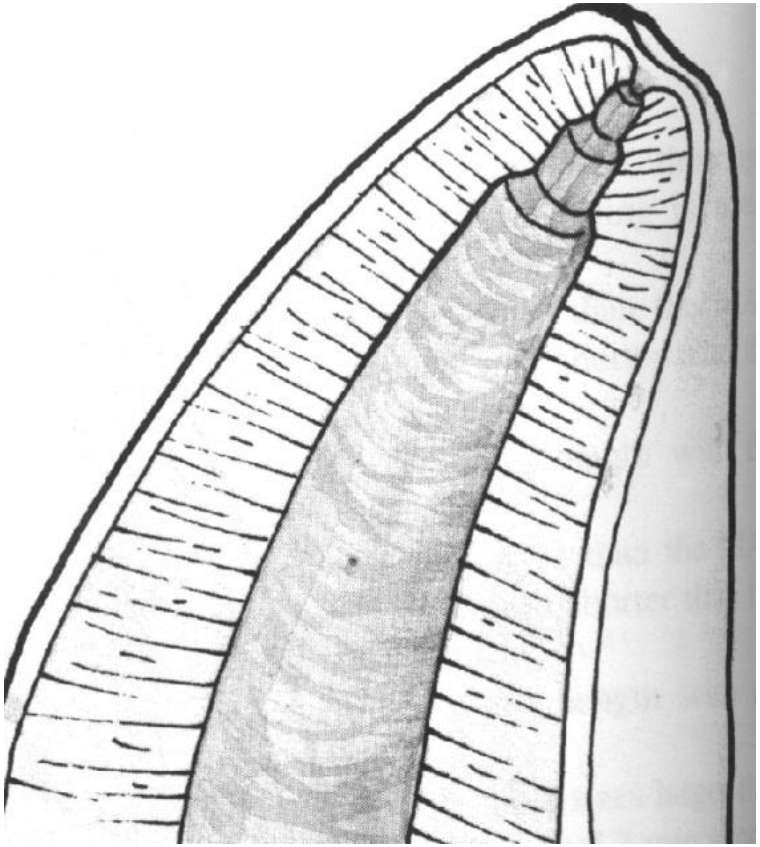
- Step back method

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.