

Instruments for cavity preparation

Hand instruments for cutting

Two main materials:

Stainless steel (loses keen edge)

Carbon steel (corrode)

Excavator

Chisel- cleaver

Instruments for cavity preparation

Power driven instruments for cutting

- Rotary instruments

Comon design characteristics



Shank

- The part that fits into the handpiece
- Accepts the rotary motion from the
- handpiece
- Provides a bearing surface to control the
- alignment and concentricity of the
- instrument

Straight handpiece shank

- Simple cylinder
- held in the handpiece in a metal chuck

Latch angle handpiece shank

- Shorter length – access to posterior regions

Handpiece – contra angle, metal bur tube.

The end of the instrument fits into D-shaped socket at the bottom of the bur tube. The *instrument* retained by a retaining latch that slides into the groove found at the shank end of the instruments.

Friction grip handpiece shank

Smaller design, simple cylinder.

Held in the handpiece by friction in plastic or metal chuck.

Neck design

Intermediate portion of an instrument that connects the head to the shaft
Tapered, shorter or longer.

Head design

Burs – cut of steel or tungsten carbid

Diamond (diamond burs)– covered with the diamond bort

Head design

Burs classification system

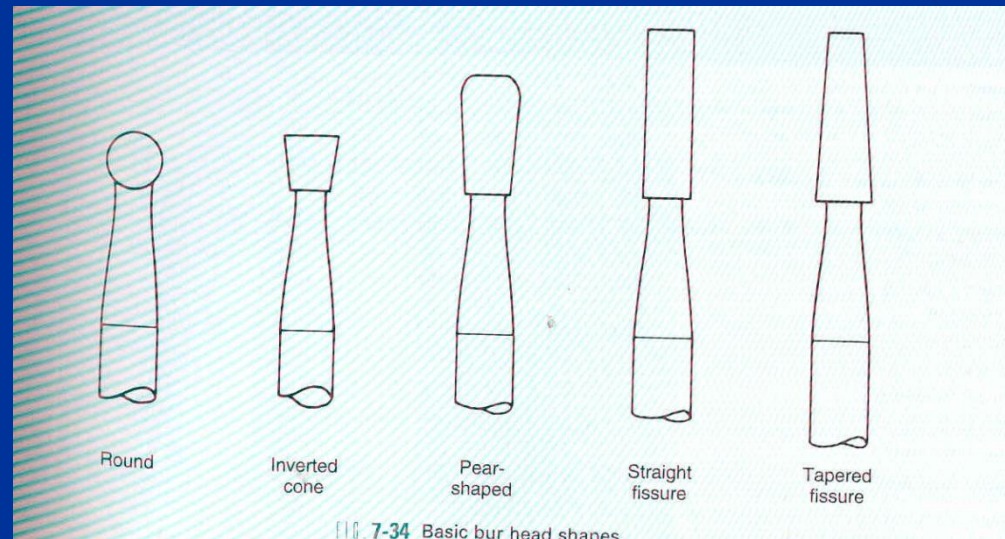
Round

Inverted cone

Pear shaped

Straight fissure

Tapered fissure



Bur blade design

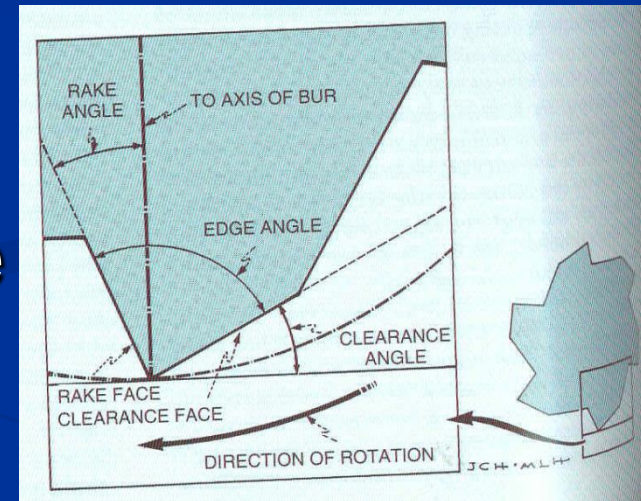
- Rake face (towards the direction of cutting)
- Clearance face

Rake angle – slightly negative

Edge angle – appr 90°

Clearance angle

Clearance face rounded or two surfaces.



Head design

Diamond classification systém

Round

Inverted cone

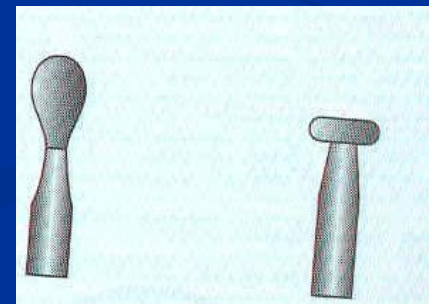
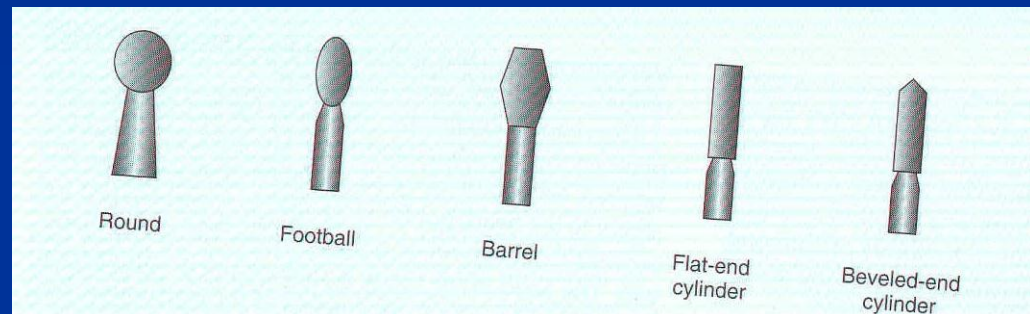
Pear shaped

Cylinder

Taper

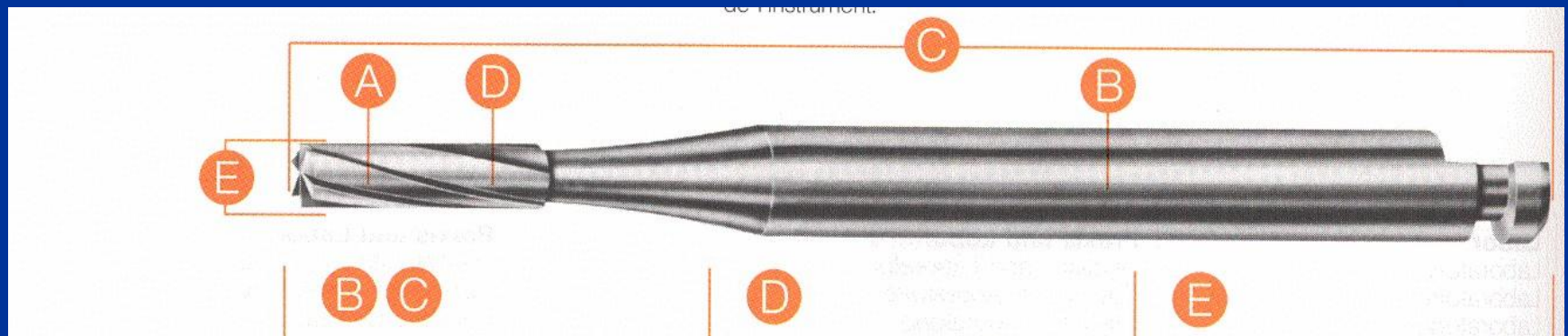
Lens

Needle etc.



Preparace strojová - nástroje

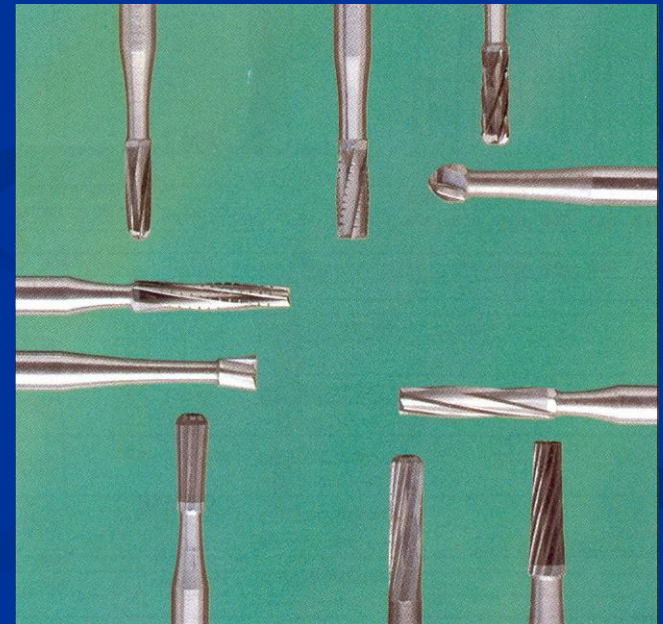
Rotační nástroje jsou konstruovány podle normy ISO 6360



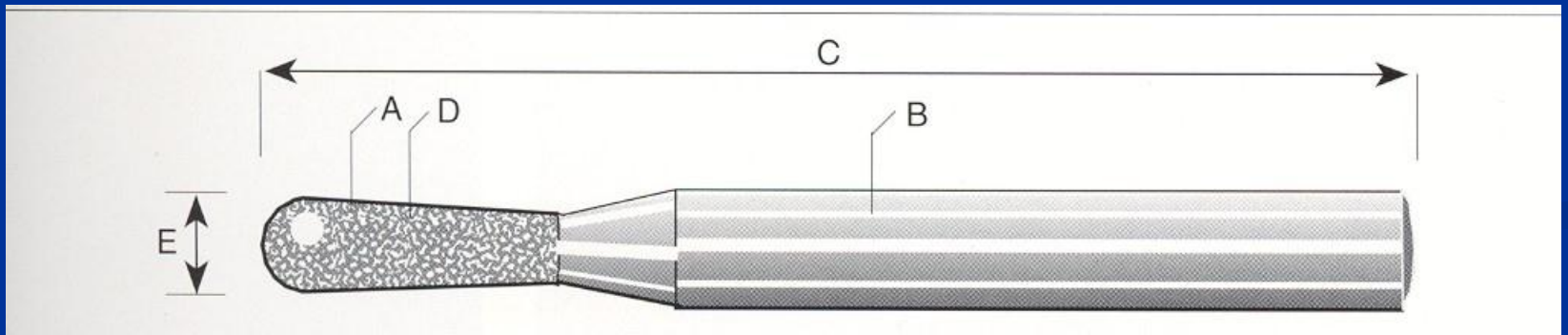
Vrtáčky

- Mají být zhotoveny z vysoce kvalitní tvrdokovové slitiny.
- Slouží k mnoha účelům
v ordinaci i laboratoři

břity odkrajují materiál
rýhy odvádějí materiál



Brousky-diamantované
- karborundové
- korundové



Diamond abrasive instruments

Diamond bort – small sharp particles in softer matrix. Cutting occurs at a large number of points.

Metal blank

Diamond powder

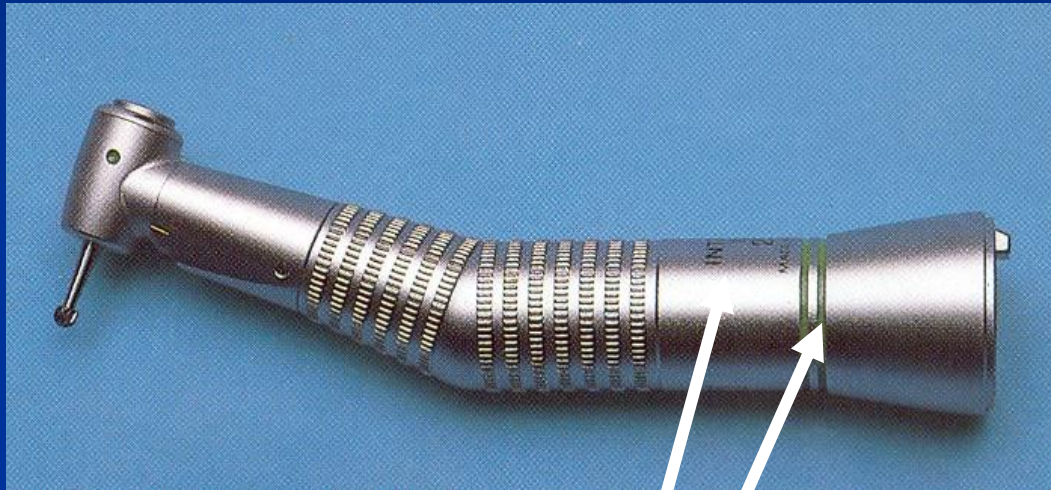
Metallic bonding material

Preparation speed

- Low (slow) speeds – below 12.000 rpm
- Medium or intermediate speeds 12.000 – 200.000 rpm
- High or ultrahigh speeds above 200.000 rpm









Spitting box
with amalgam
separator



Hoses – upper leading



Hoses – upper leading



Cavity preparation

- Power driven

- Hand



400.000 rpm

Electromotors – maximum 40.000/min

Blue code – gear 1:1



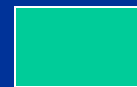
Airmotors – maximum 20.000/min

Gearing to fast speed



1:5

Gearing to slow speed



2,7 :1 or 7,4 :1

Oscillation





1 : 1 as far as 40.000 rpm

Red coded handpiece



1:4 až 1:5 as far as 160.000 – 200.000 rpm

Preparace strojová - pohony



2,7:1

7,4:1

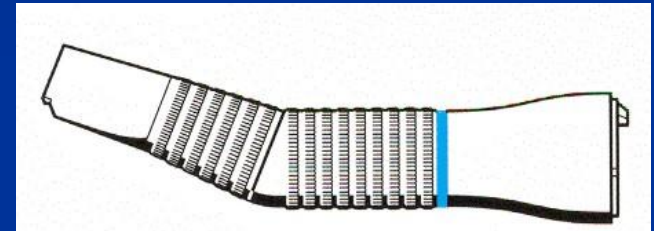
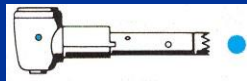
Blue and green coded handpiece



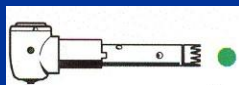
Hanpieces combined



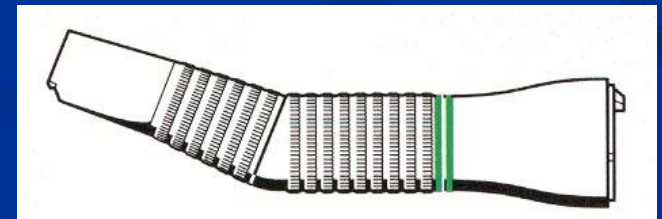
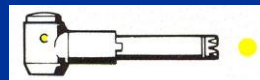
1:1



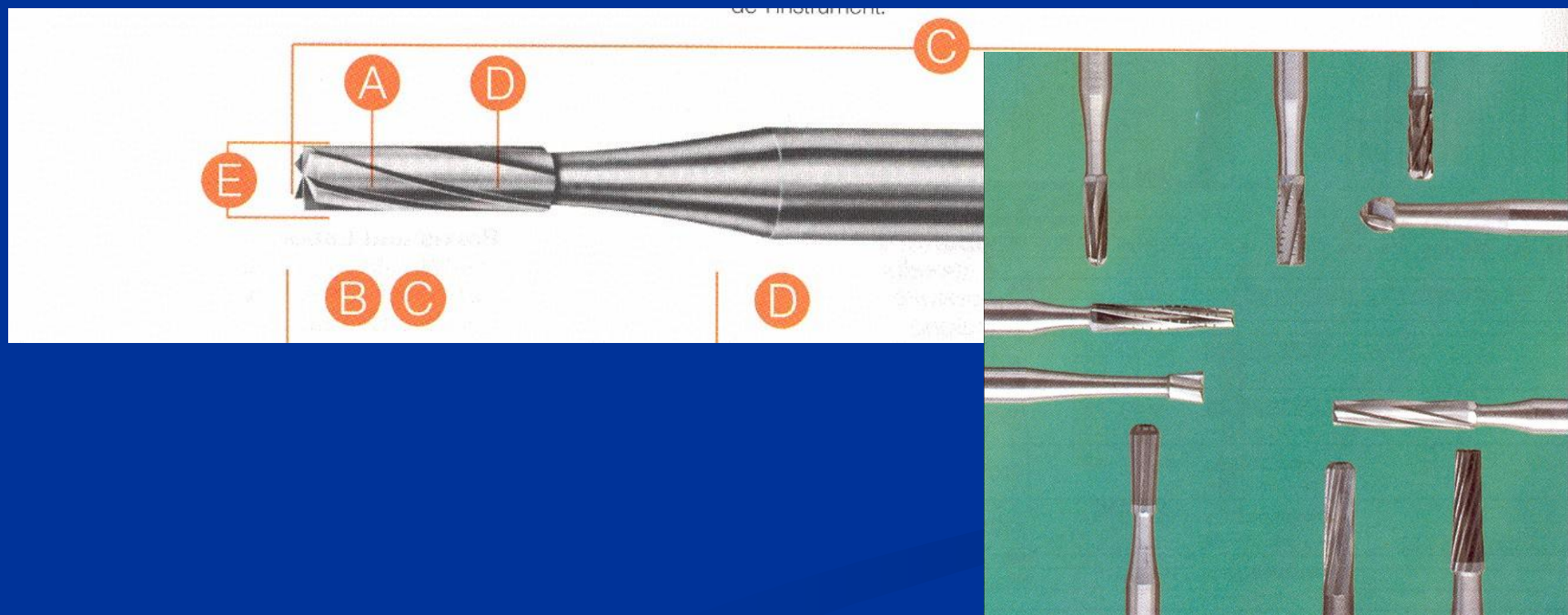
2:1

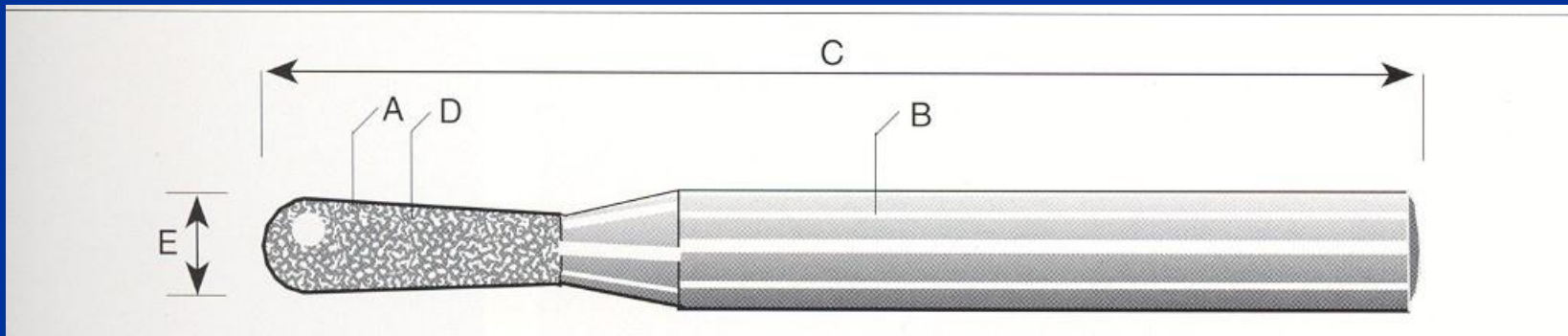


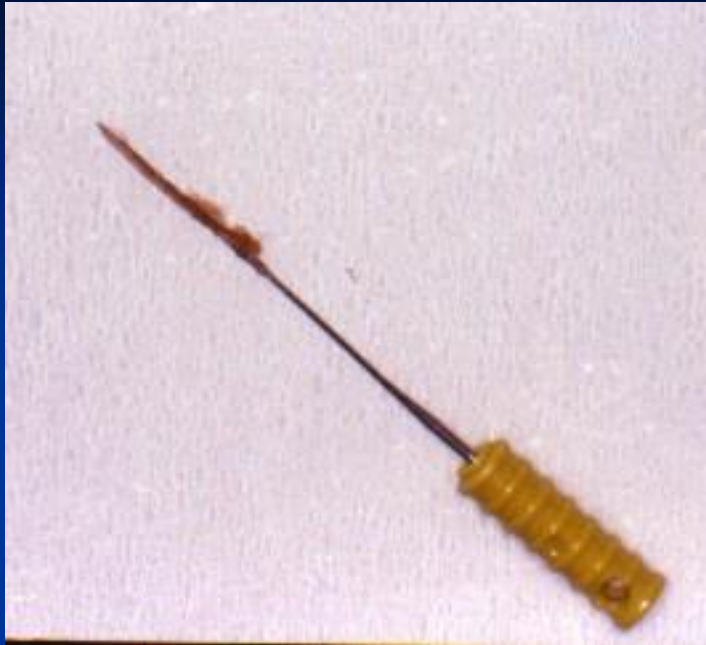
nerotuje



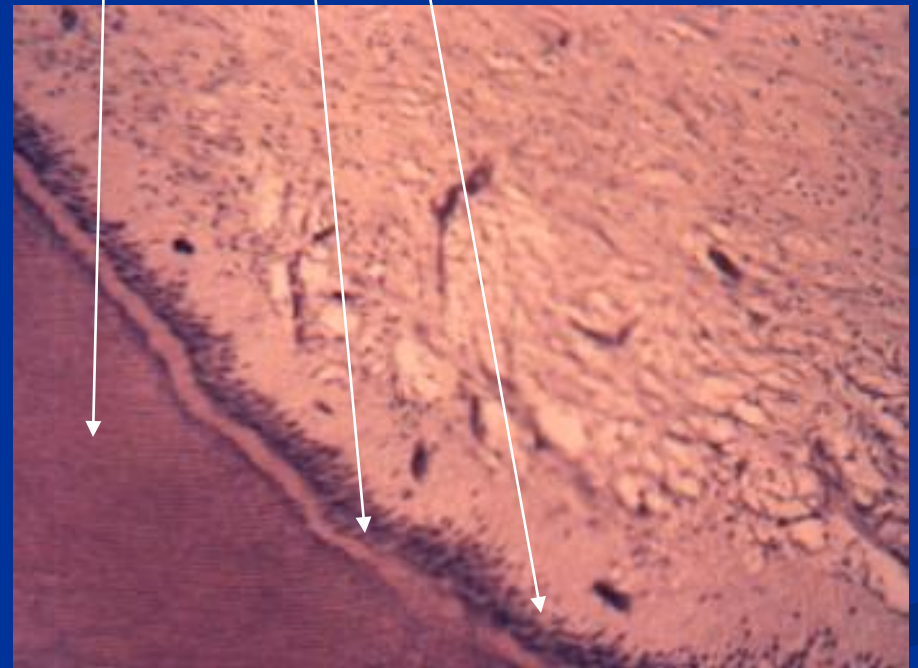
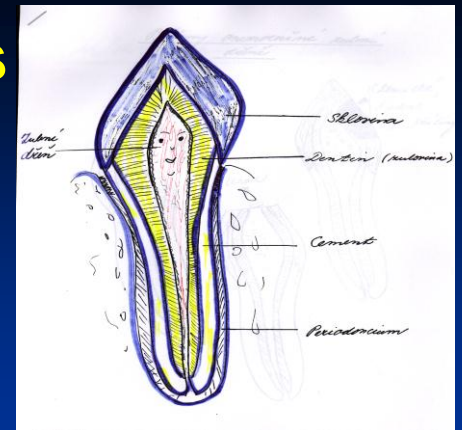
ISO 6360







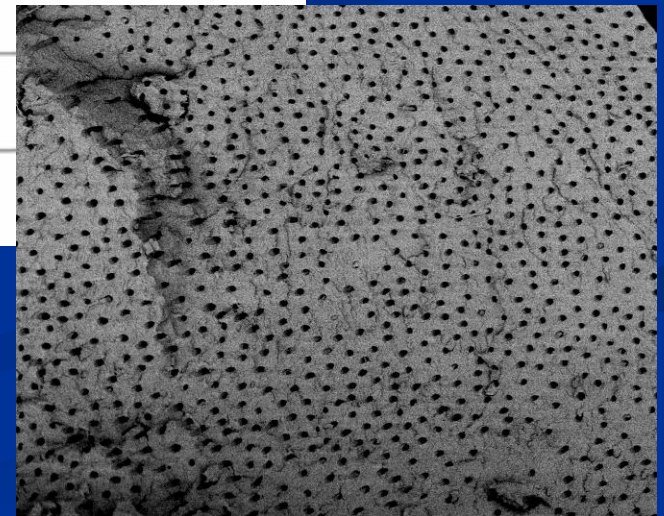
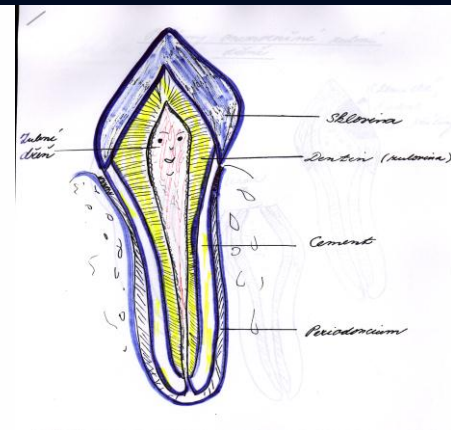
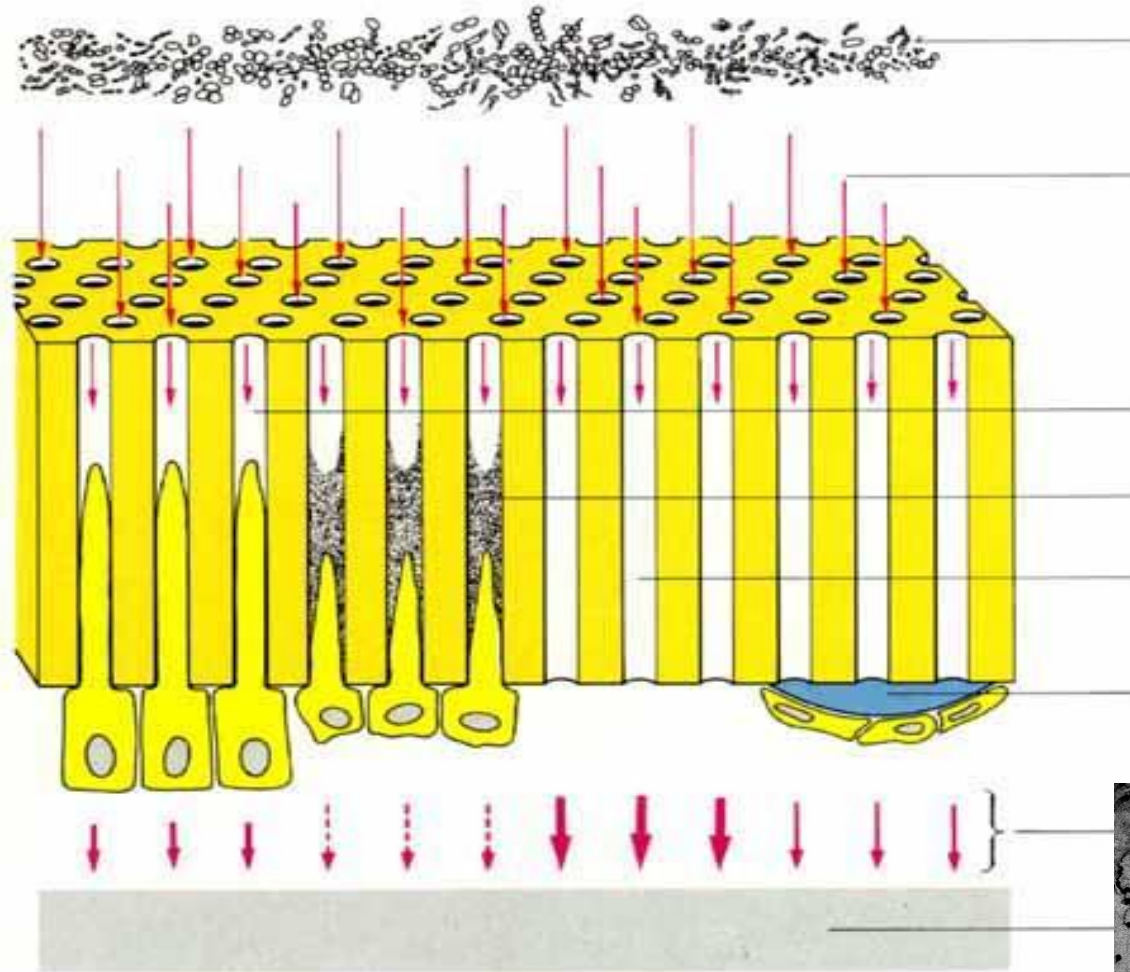
Odontoblasts
Pre-dentin
Dentin

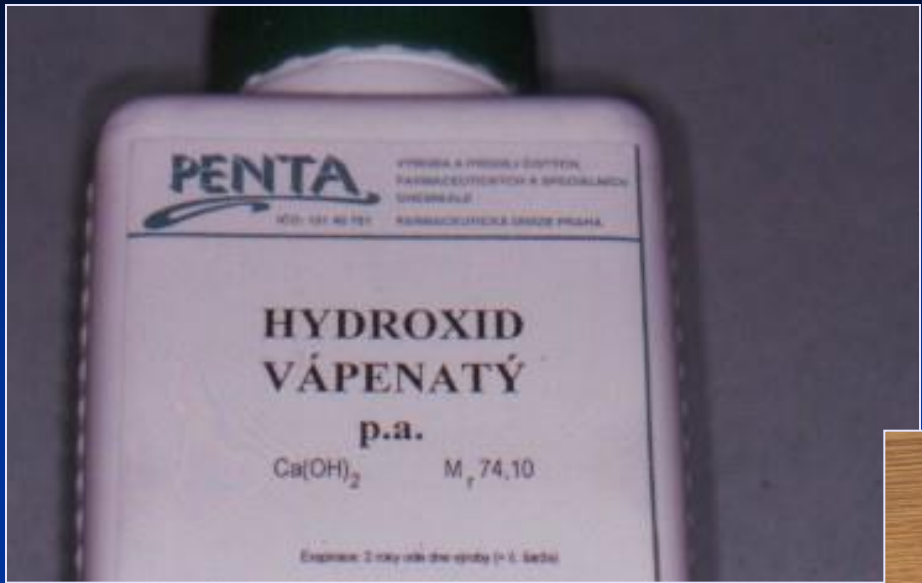


Dental pulp

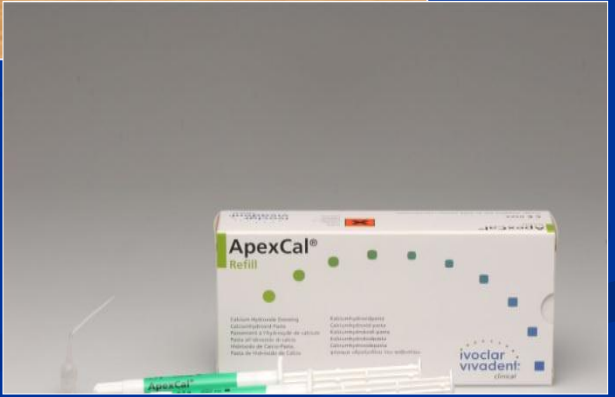
Defense mechanisms of the pulp

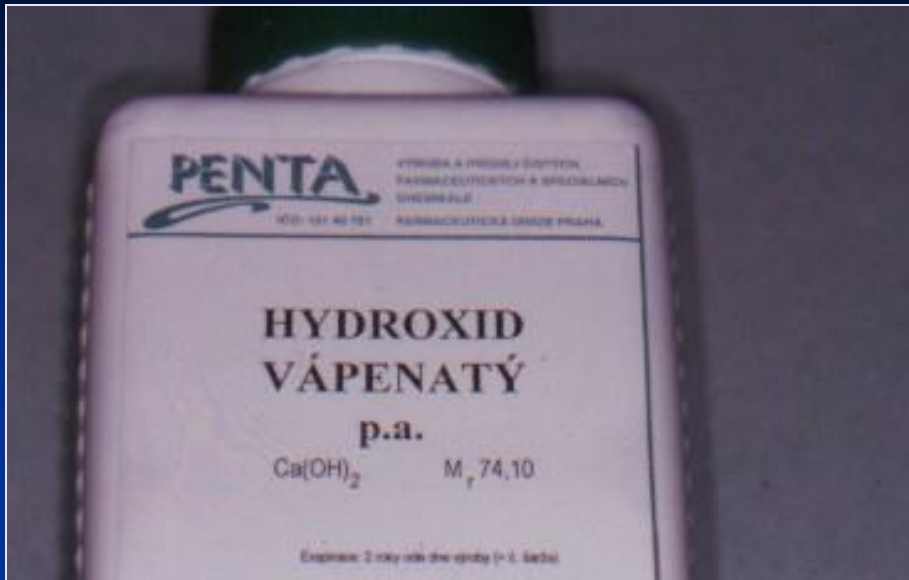
- Sclerosis
- Tertiar, reparative dentin
- Dentin bridge





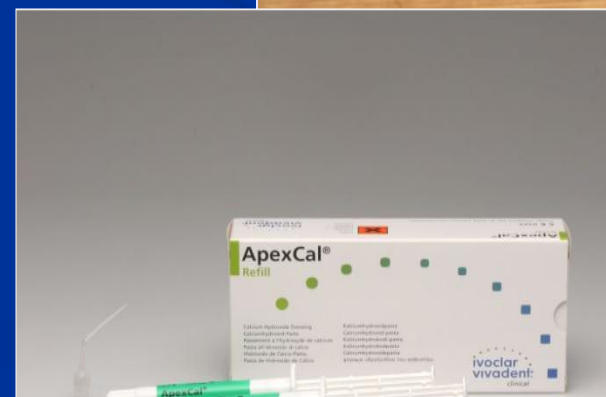
pH 12,5

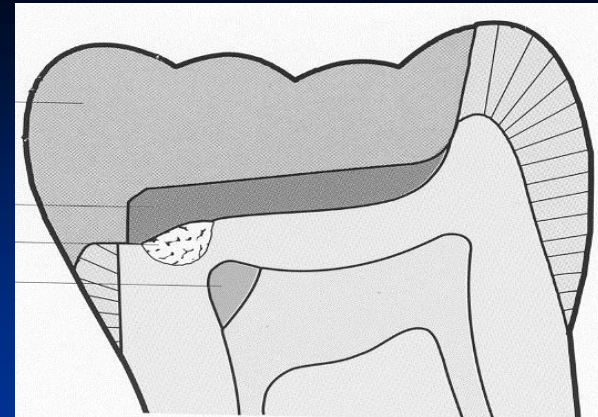
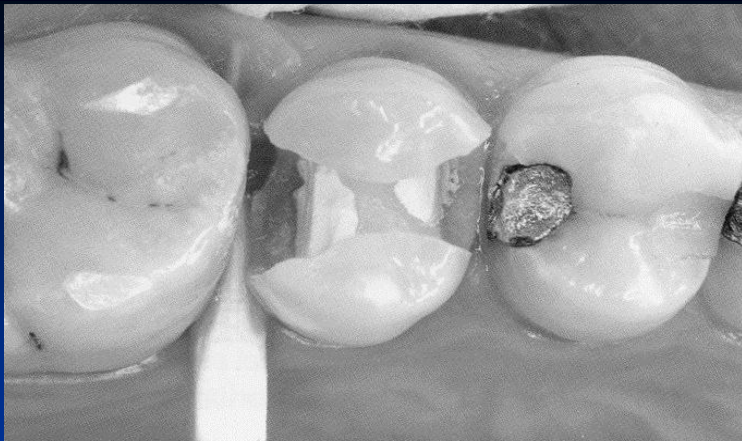




Antiflogistický
Dentinogenní
Antimikrobiální efekt

- Suspenze
- Cementy
- Subbase
- Kořenová výplň
- krátkodobě
- střednědobě
- dlouhodobě





Indirect pulp capping

Deep caries

Probably changes in dental pulp

Infection inside

Calcium hydroxide influences the pulp
through dentin

Inflammation is healing

New reparative dentin is produced

Direct pulp capping

Perforation

Surrounded with healthy dentin

Perforation must be small

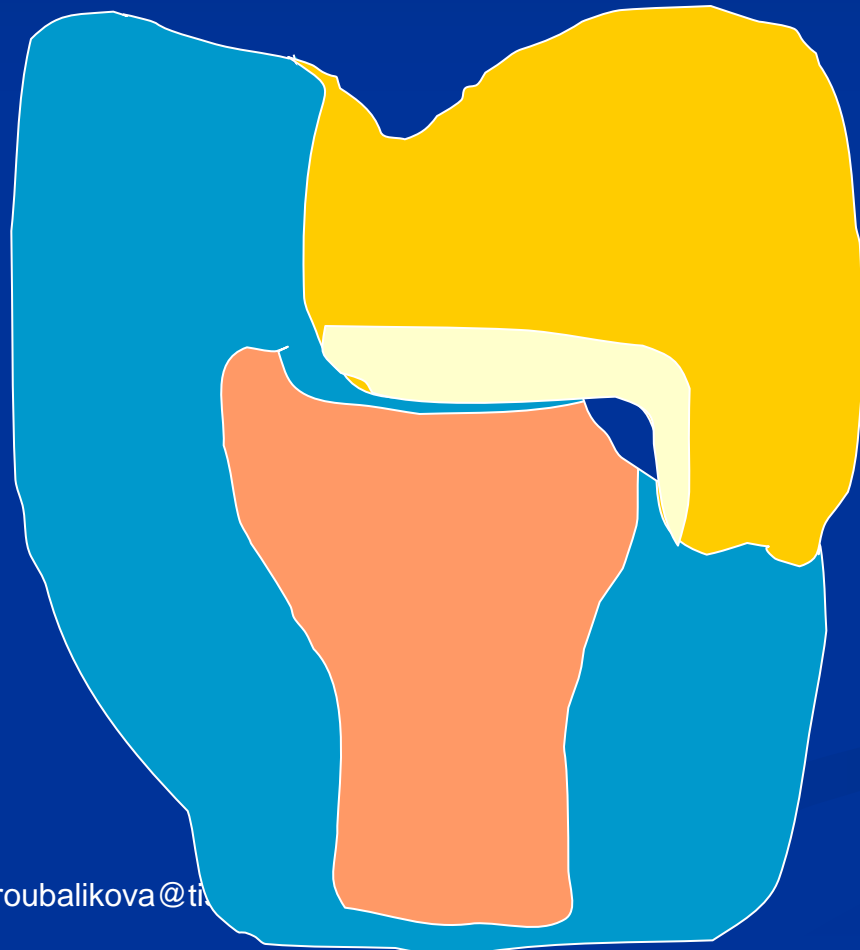
Calcium hydroxide on the perforation

Cover with base and filling.

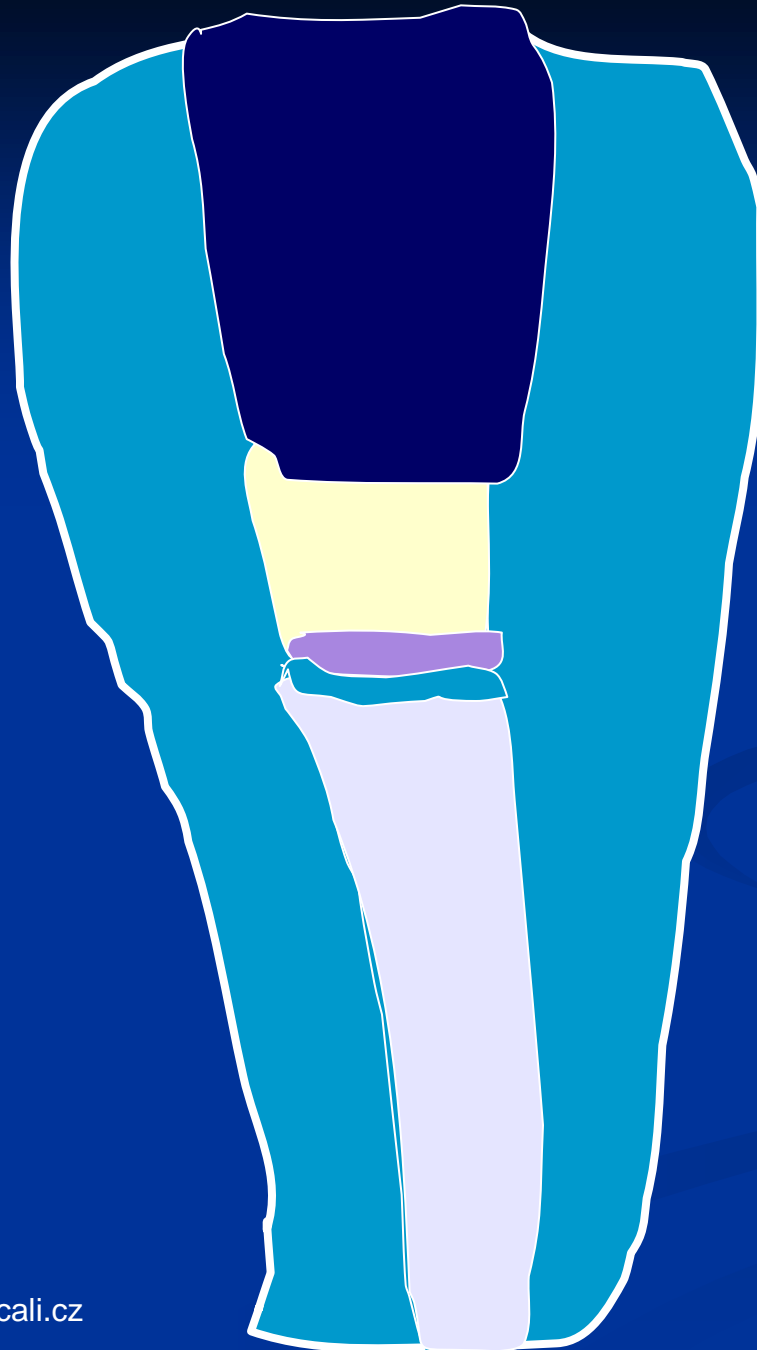
Dentin bridge – in 7 weeks



Direct pulp capping



High risk in
teeth with closed
apex

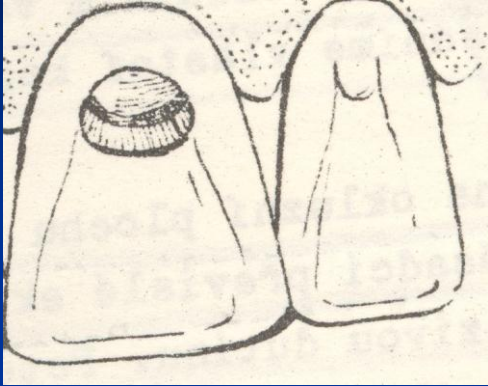


Pulpotomy

The part of dental pulp is removed

The rest is covered with calcium hydroxide, base and filling

Class I.



All pit and fissure restorations.

They are assigned in to three groups.

R. on occlusal surface of premolars and molars

R. in foramina coeca – usually on occlusal two thirds of the facial and lingual surfaces of molars.

R.on lingual surface of maxillary incisors.

Contraindications

- Aesthetically prominent areas of posterior teeth
- Small moderate classes I. that can be well isolated

Materials: Amalgam, composite.

Amalgam:

Pertinent material qualities and properties

Strength

Longevity

Ease of use

Clinically proven success

Indications

- Moderate to large restorations
- Restorations that are not in highly aesthetics areas
- Restorations that have heavy occlusal contacts
- Restorations that cannot be well isolated
- Restorations that extend onto the root surface
- Foundations
- Abutment teeth for removable partial dentures
- Temporary or caries control restorations.

Clinical technique

- From the occlusal surface using the fissure bur (or diamond burs, see below).

Outline

- Ideal outline includes all occlusal pits and fissures. If crista transversa or obliqua are not affected, it is recommended not to prepare them.

Resistance principles

- Keep the facial and lingual margin extensions as minimal as possible between the central groove and the cusp tips.
- Extending the outline to include fissures, thereby placing the margins on relatively smooth sound tooth structure.
- Minimally extending into the marginal ridge without removing dentinal support.
- Eliminating a weak wall of enamel by joining two outlines that come close together
- Enamel.
 - Never leave the enamel undermined
- All corners are round, the bottom smooth.

Retention principles

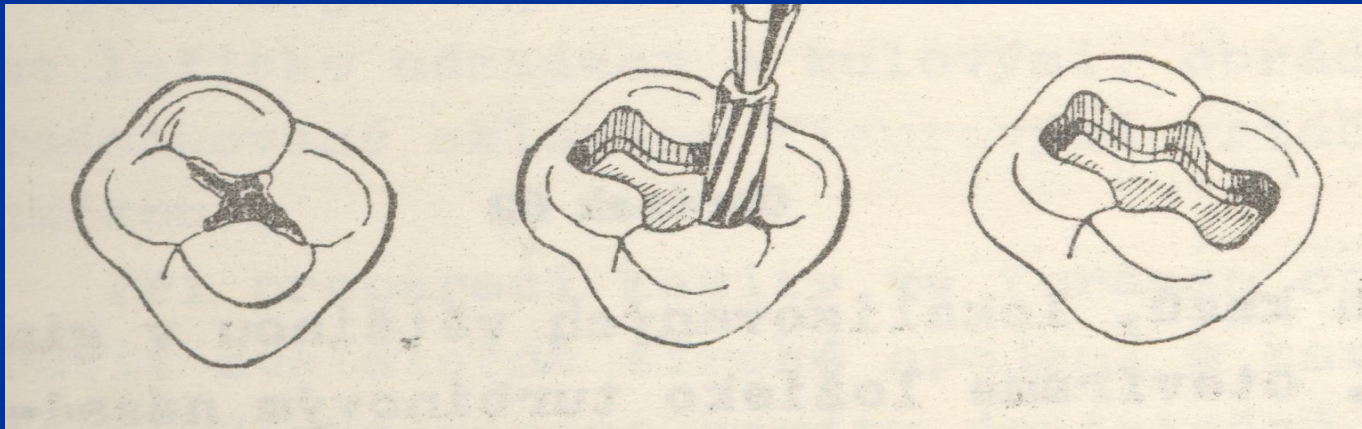
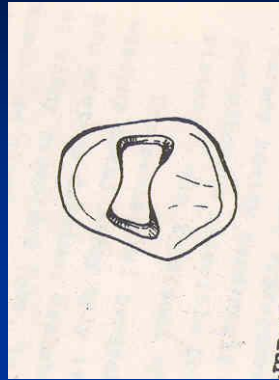
- Prepare the box – the bottom is in dentin
- Undercuts can be prepared, the proximal ridges must not be weakened!

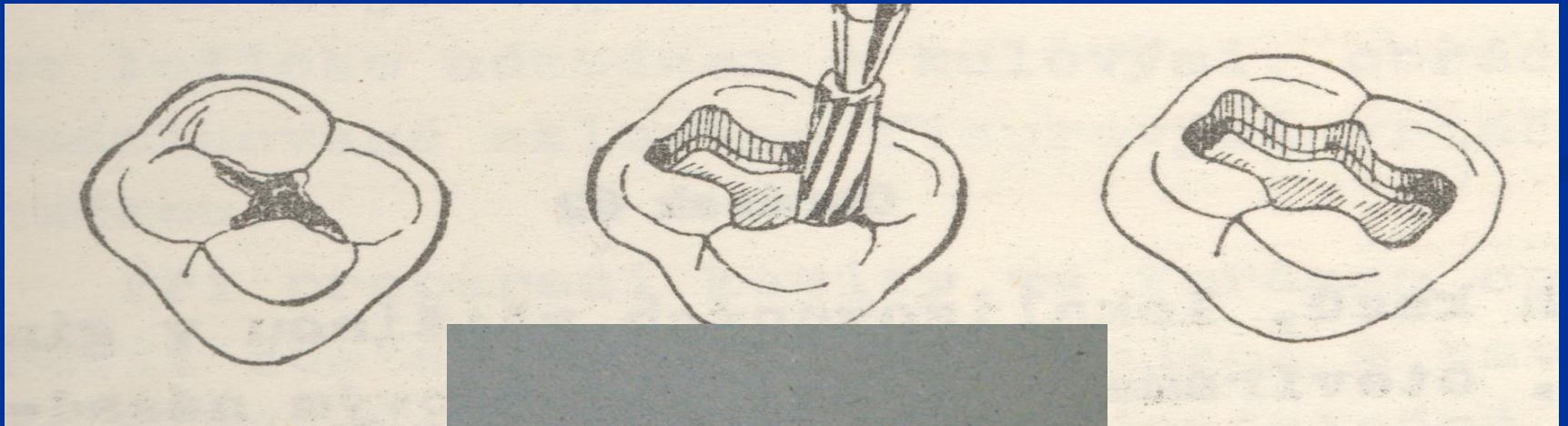
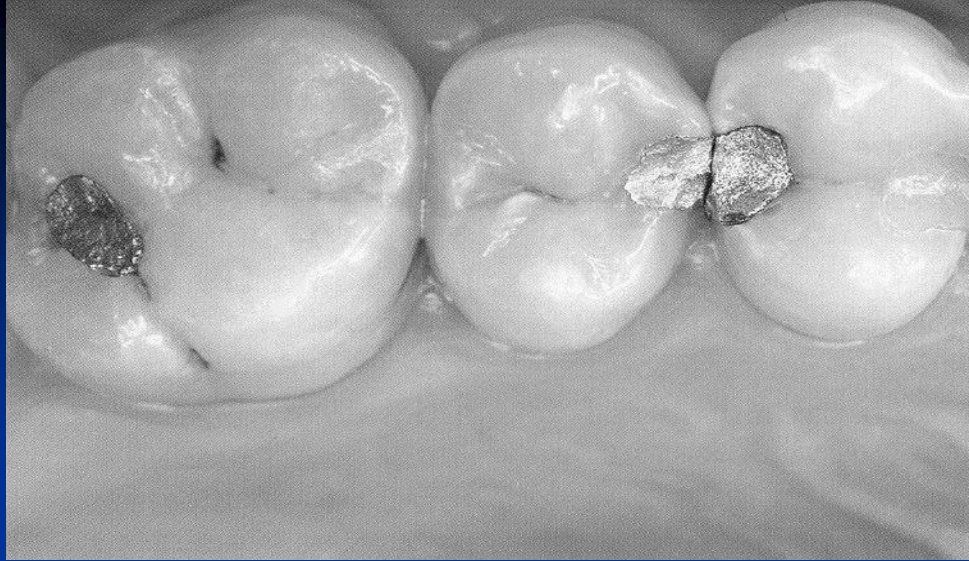
Removal of carious, infected, dentin and remaining defective enamel.

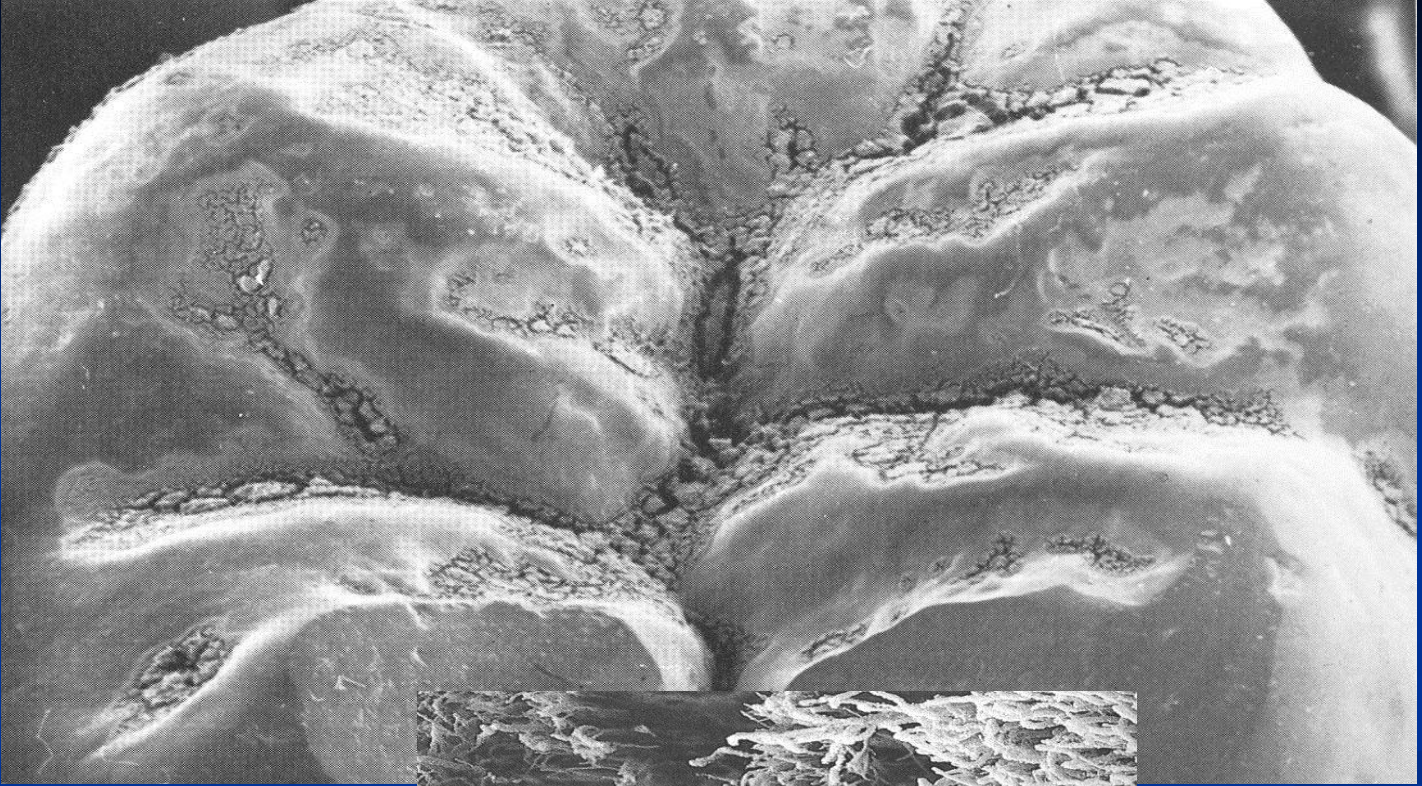
- Spoon excavator or a slowly revolving ,
round carbid bur of appropriate size.

Finishing and polishing

- Fine grit diamond bur.

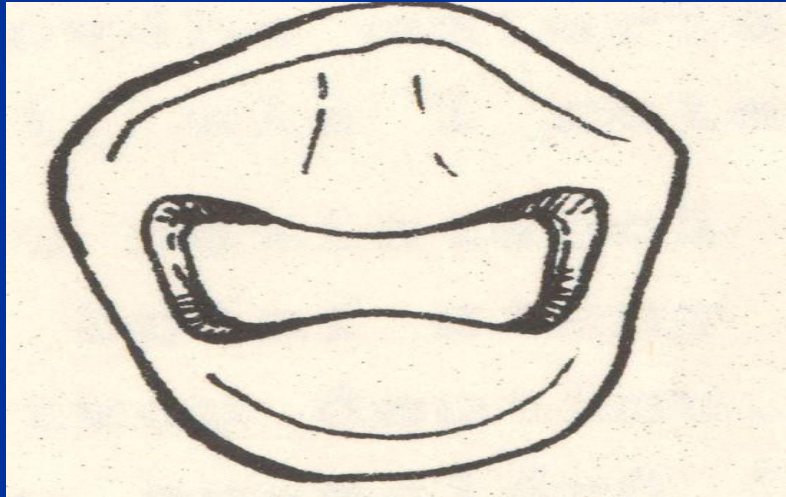
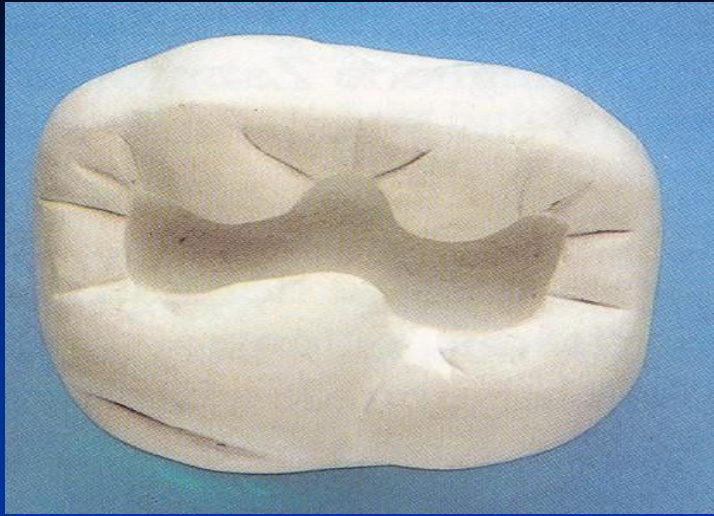






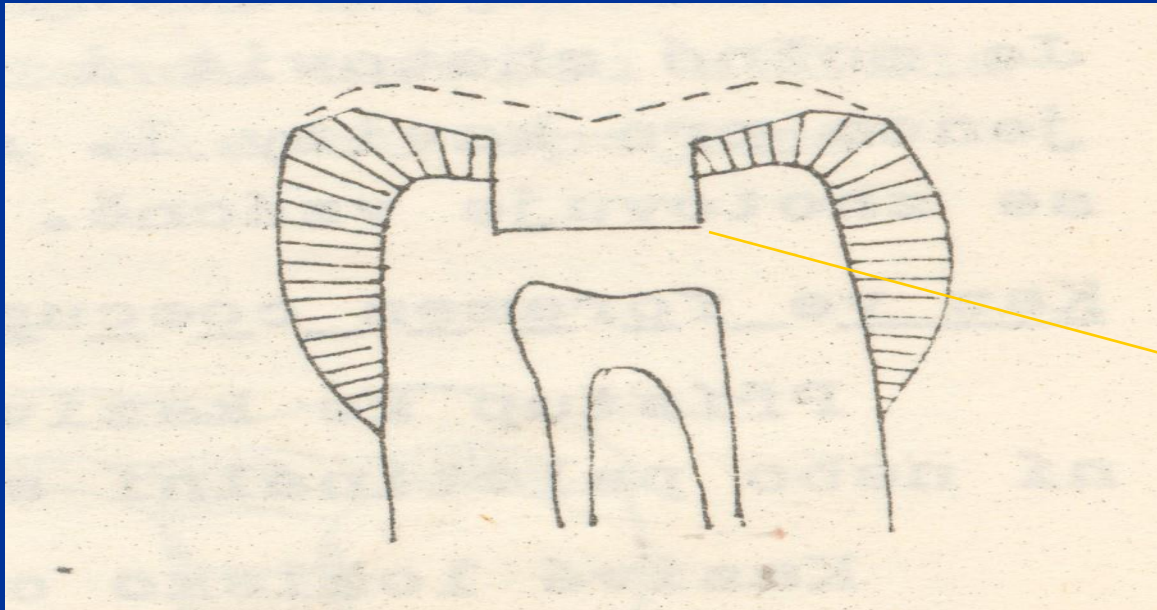




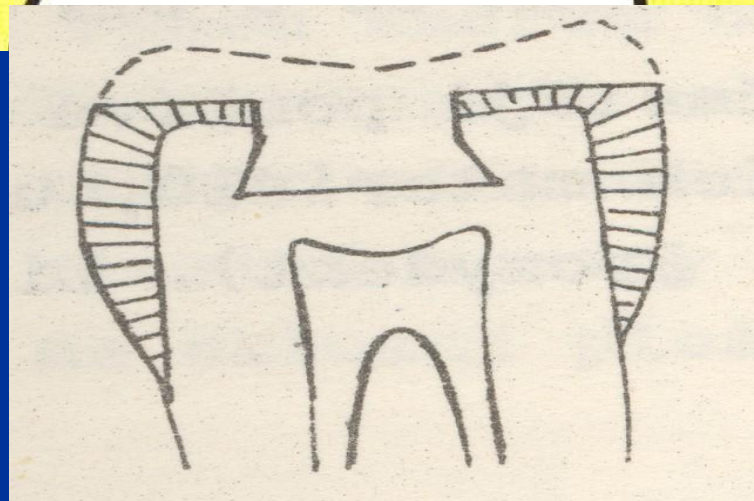
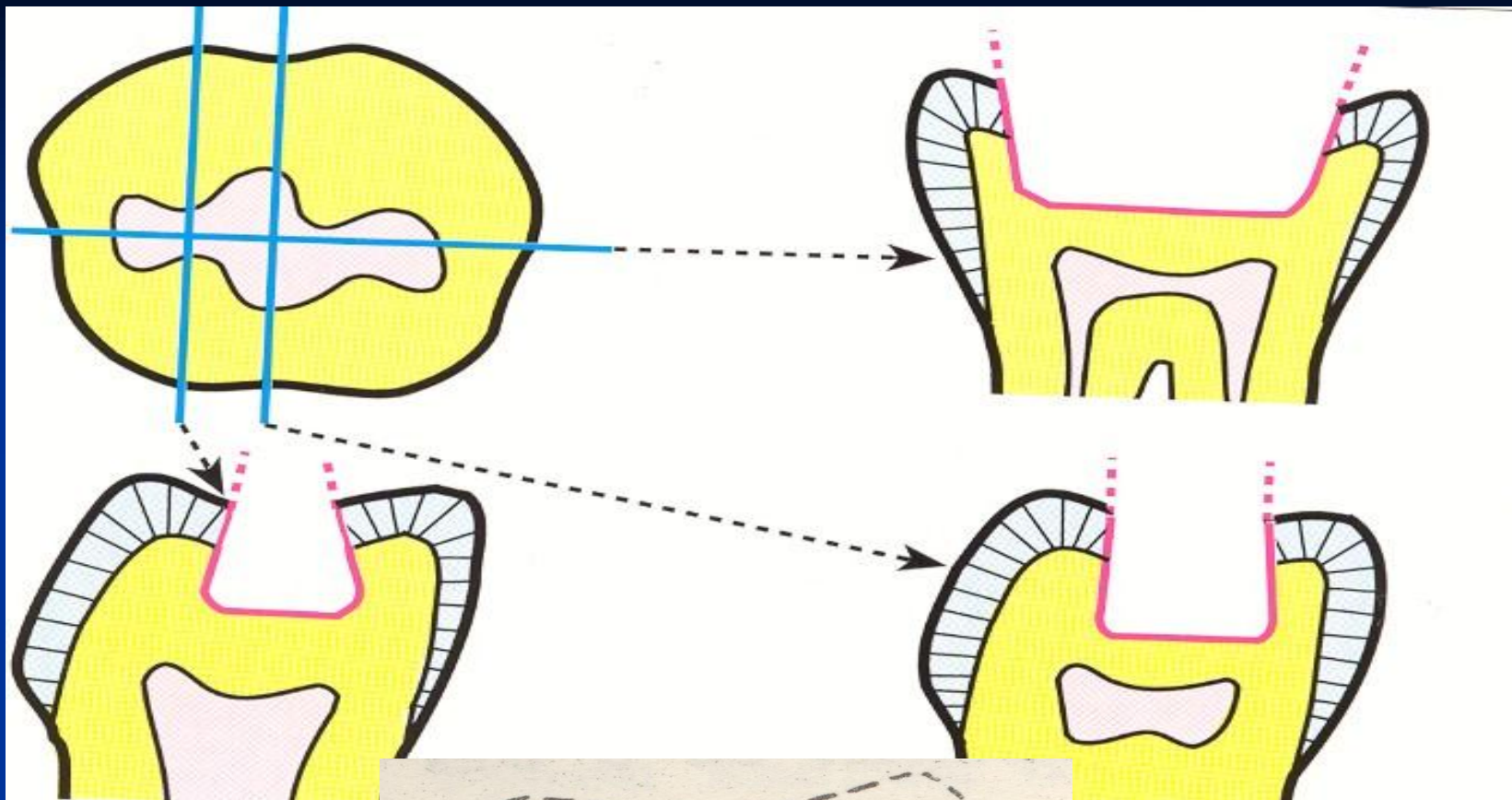


Box

- (1,5 – 2 mm

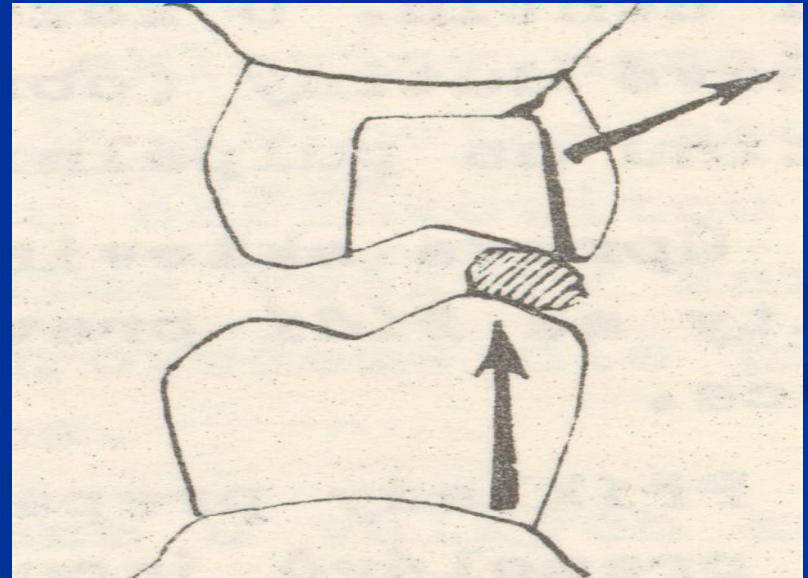


Mistake



Resistance

- No undermined enamel, no close to the top of cusp than 1 mm

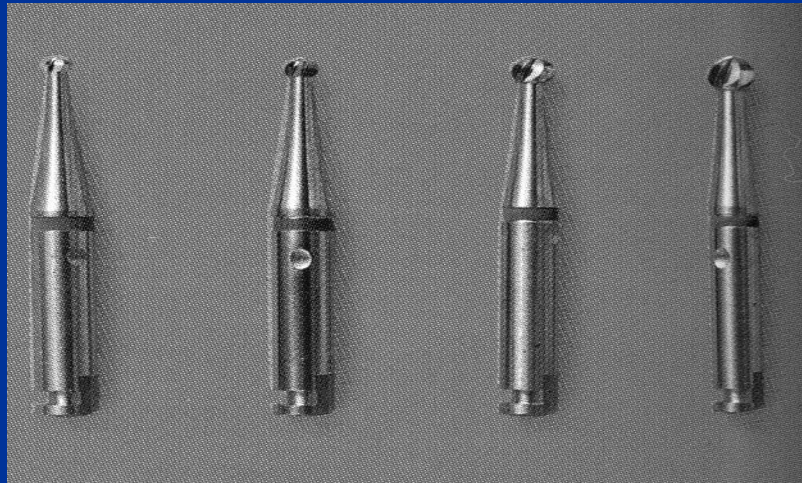


Excavation of carious dentin

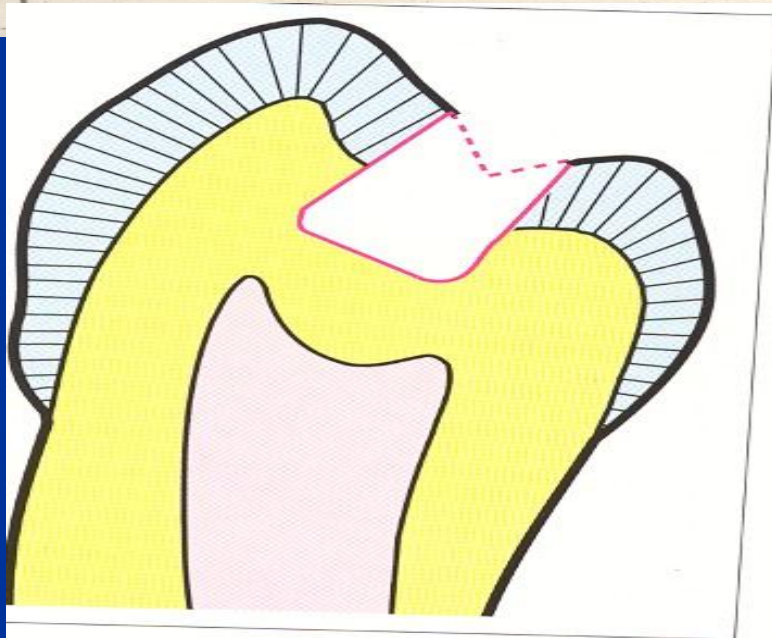
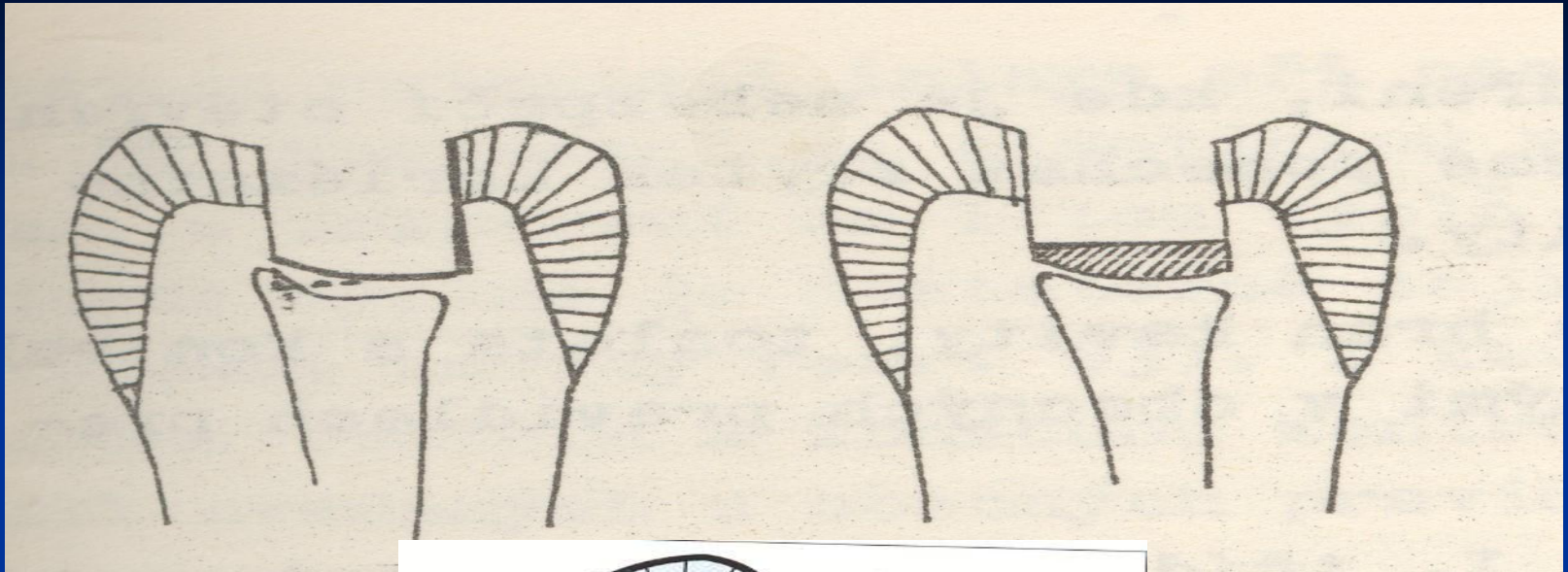
■ Ball burs



Caries detektor



Low rpm – 3000/min



Finishing and polishing

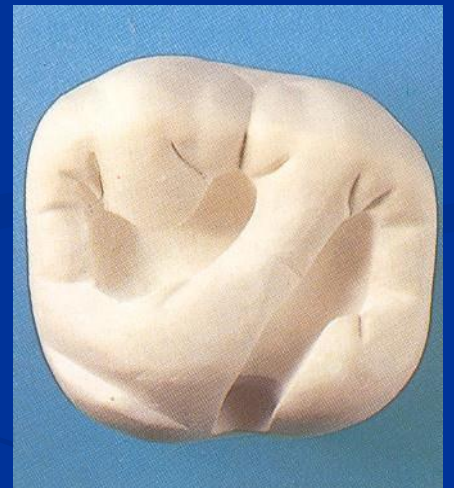
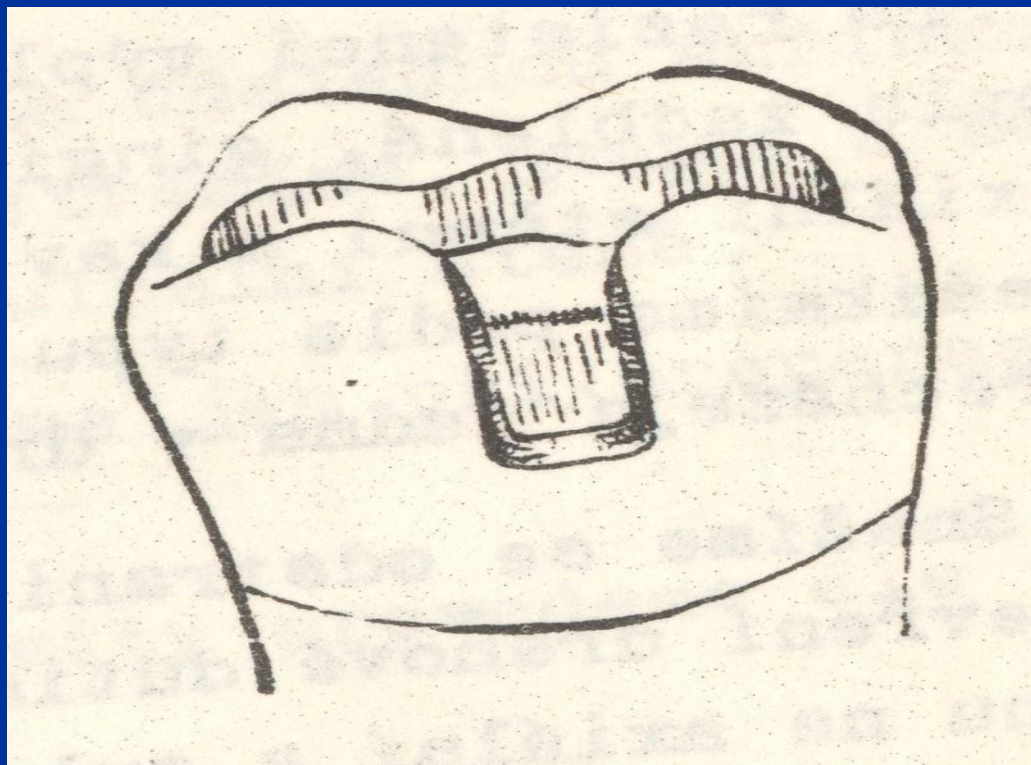
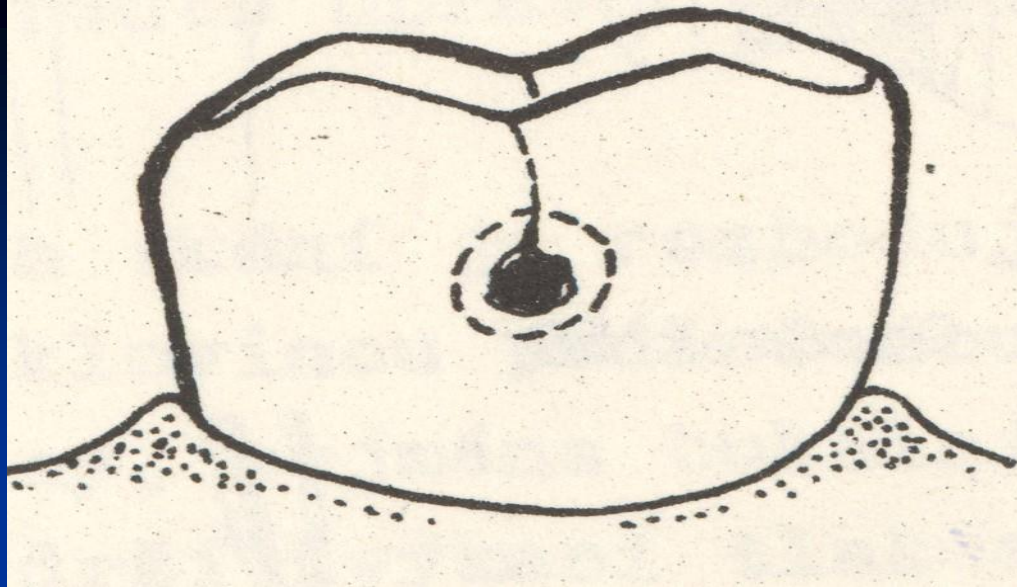
Ohlazení - stěny nezešikmujeme!!!

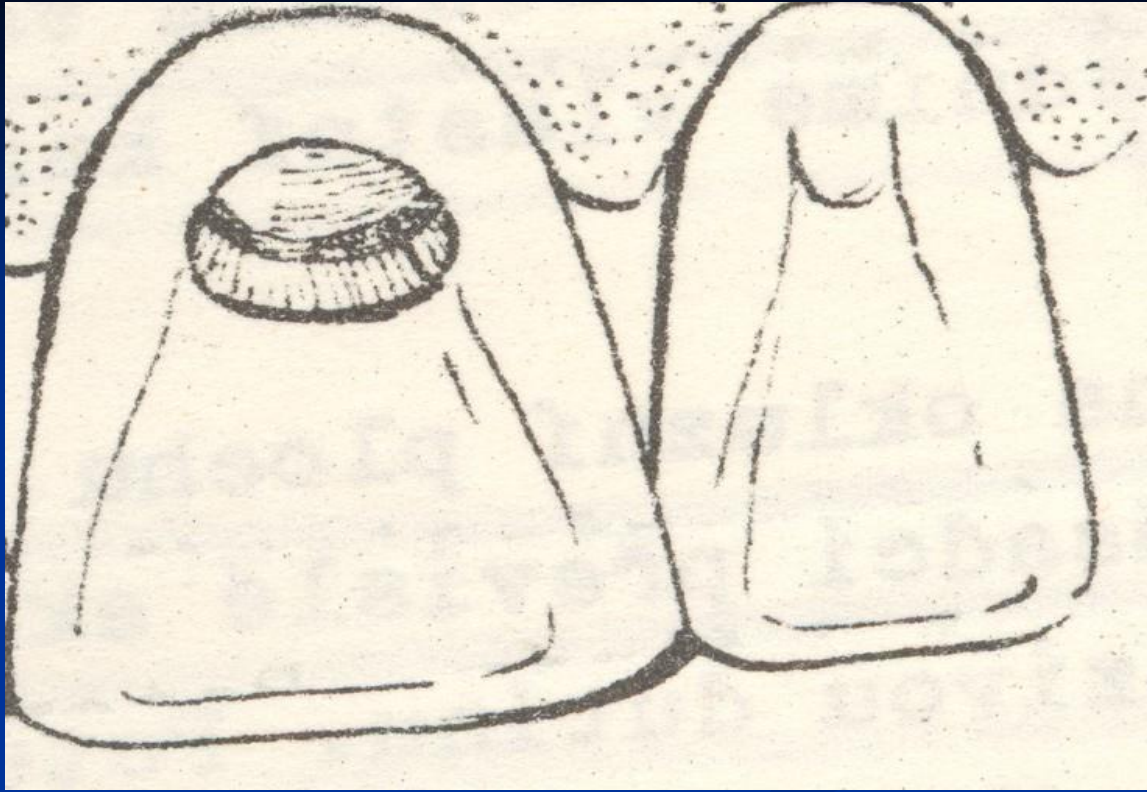
Jemný diamantovaný brousek (s červeným označením) – otáčky okolo 20 000/min.



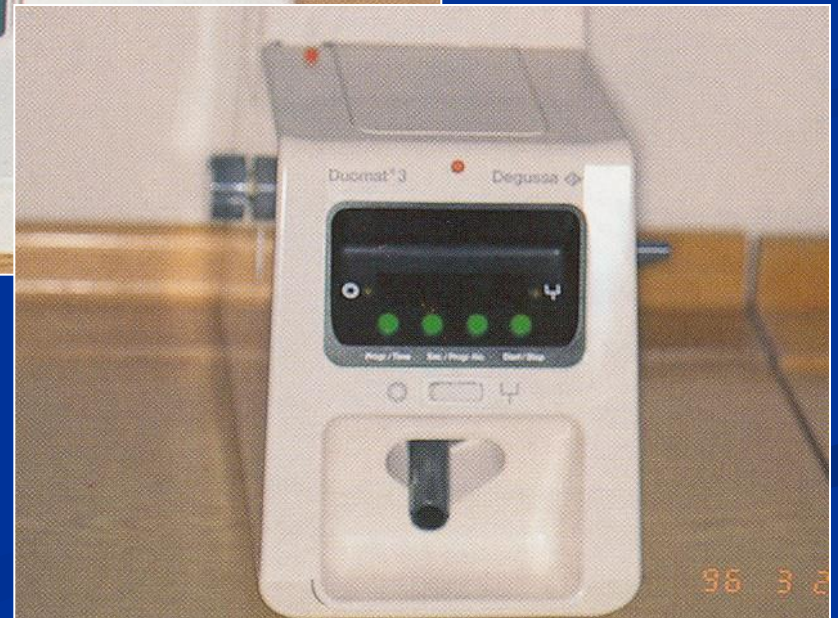
Final control

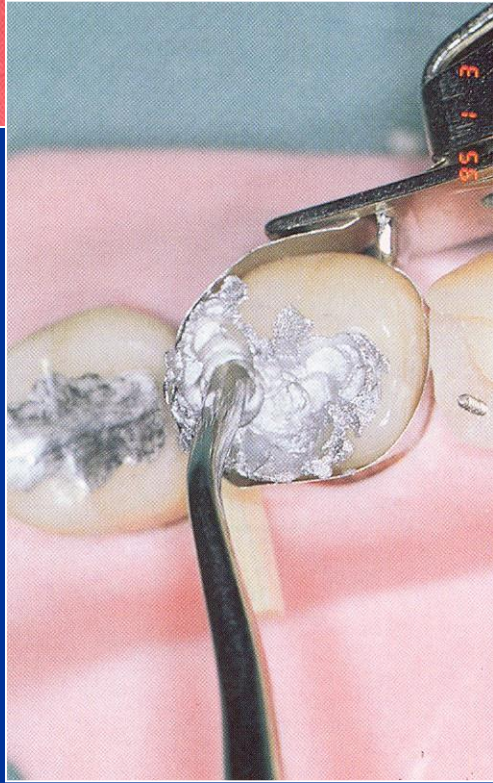
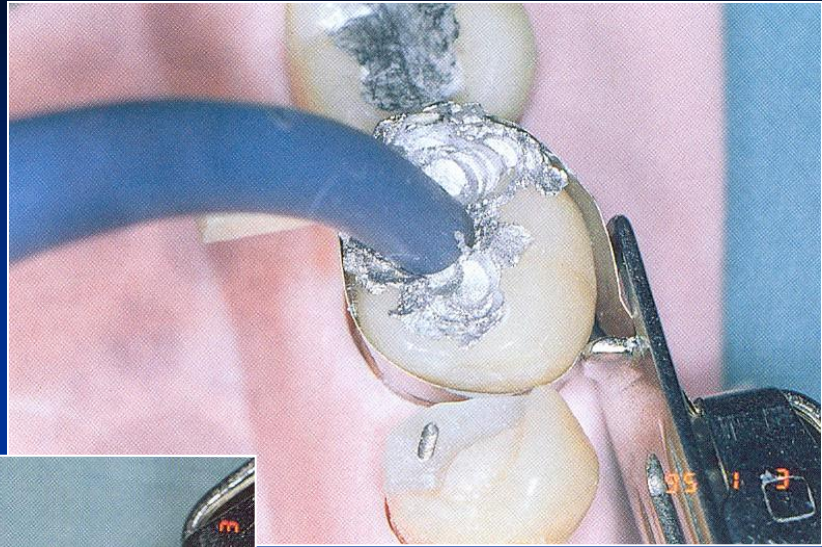
Kontrola zrakem v dobrém osvětlení,
vypláchnutí vodní sprayí a sušení.

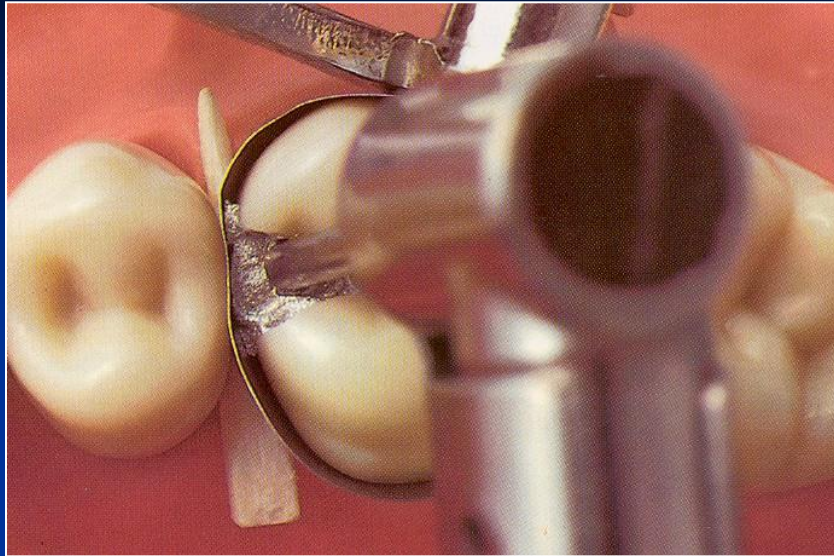




U kazů ve foramina coeca:
Preparace v rozsahu ložiska
Do dentinu
Lze podsekřiviny
Ohlazení okrajů









Instruments

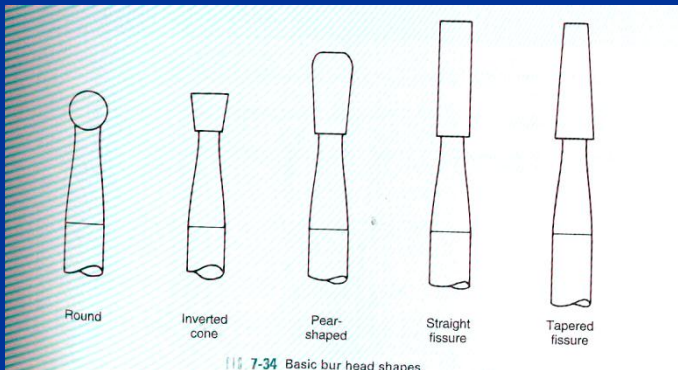
- Preparation instruments
- Filling instruments
- Carvers
- Burnishers

Instruments

➤ Preparation instruments - power driven

Burs

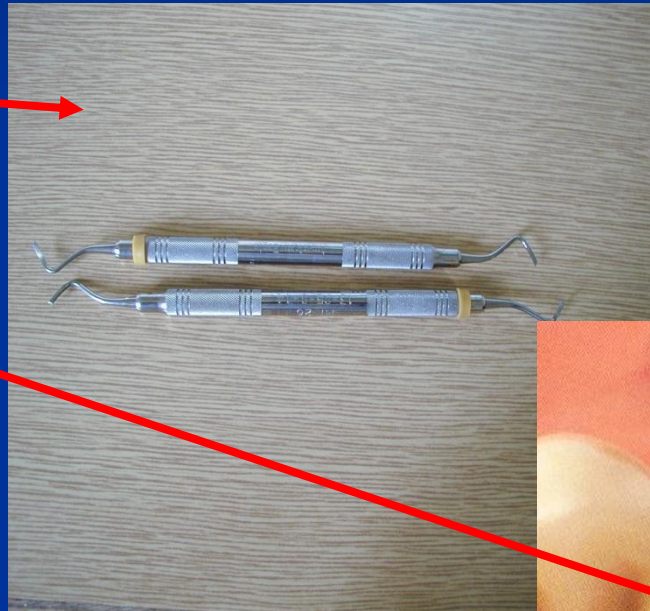
Diamonds



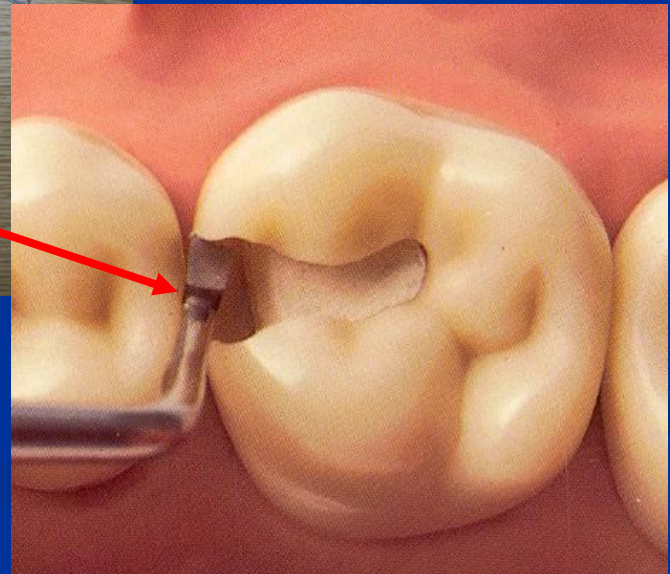
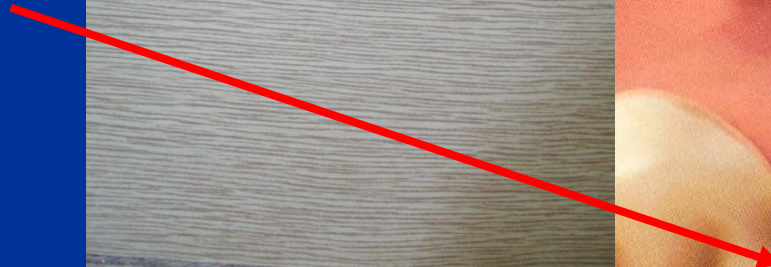
Instruments

➤ Preparation instruments - hand

Chisel

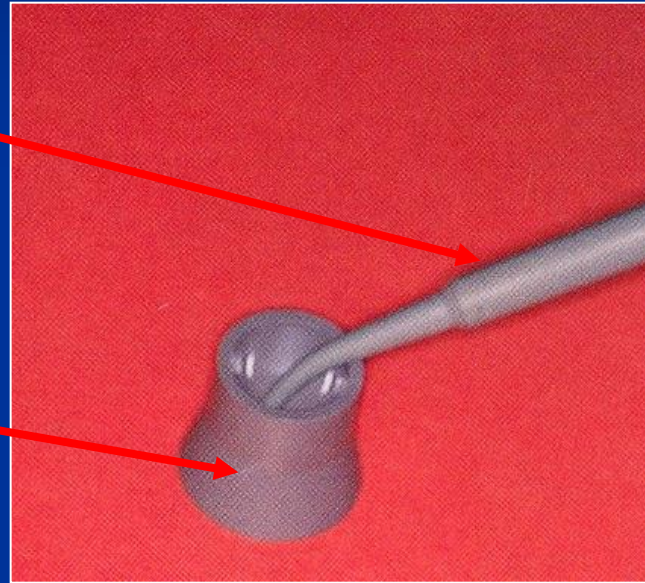


Excavator



Amalgam gun

Crucible



Amalgam carrier



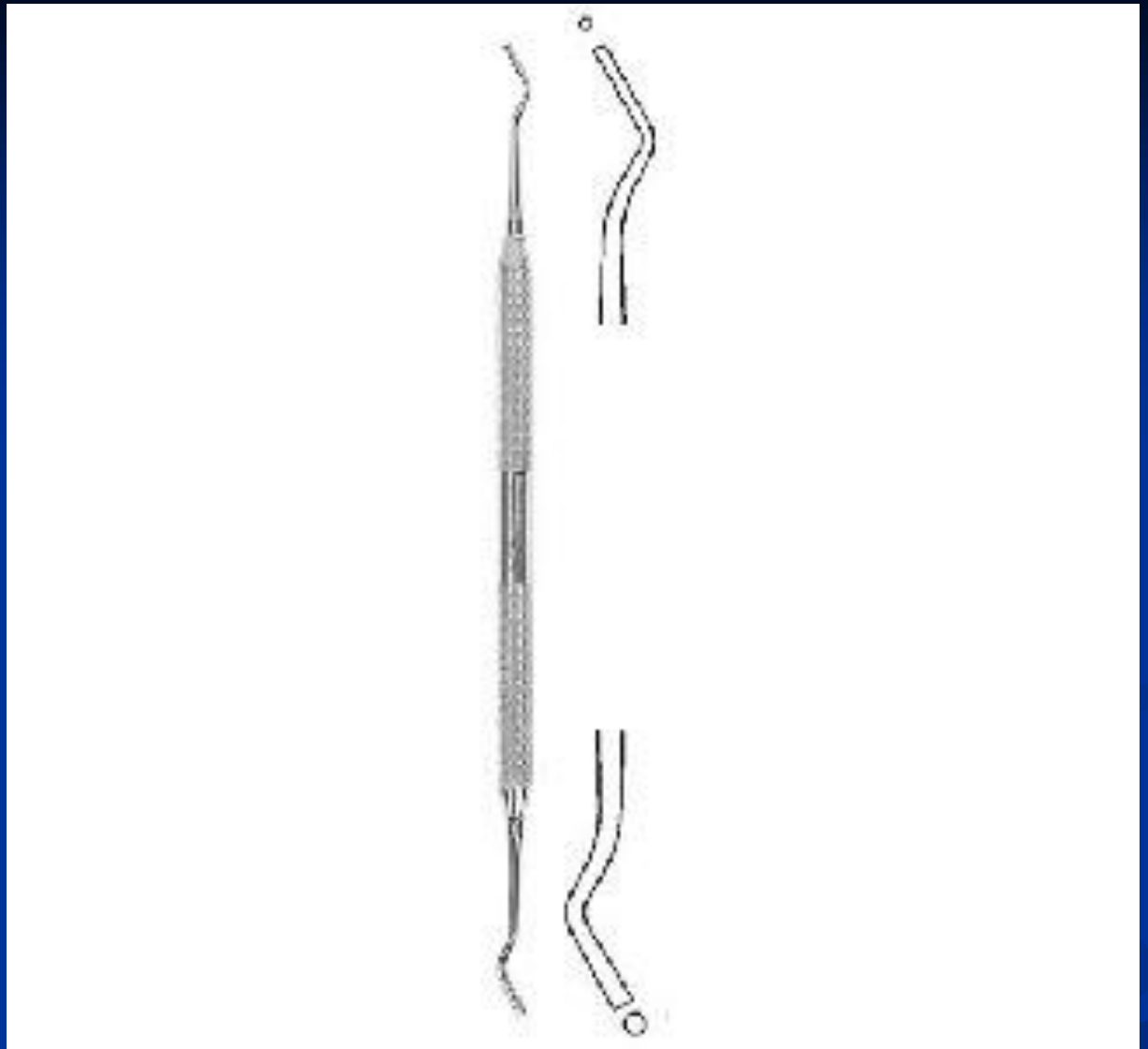
Amalgam carrier



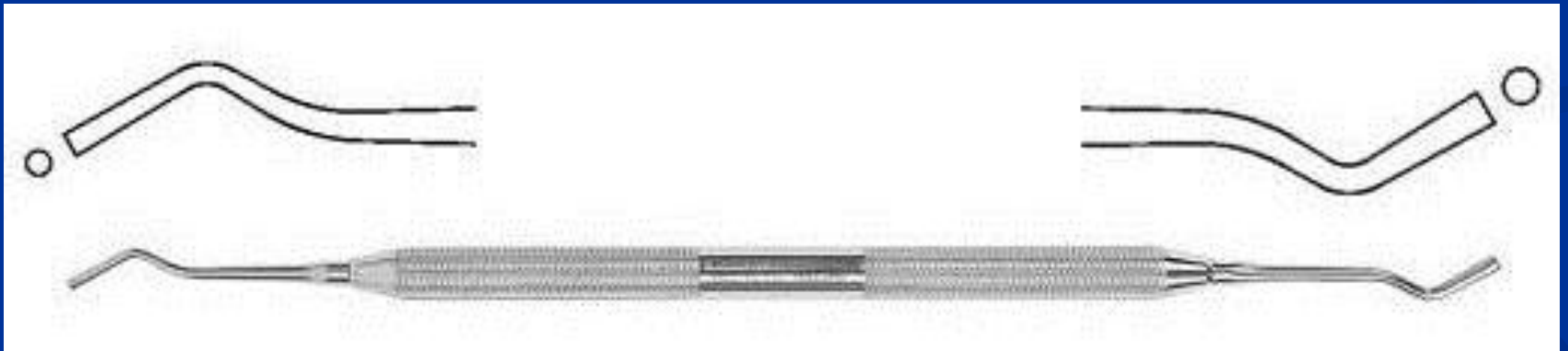
Instruments

- **Filling instruments condensers and spatulas**

Condensor - stamen



Condensor with straight front

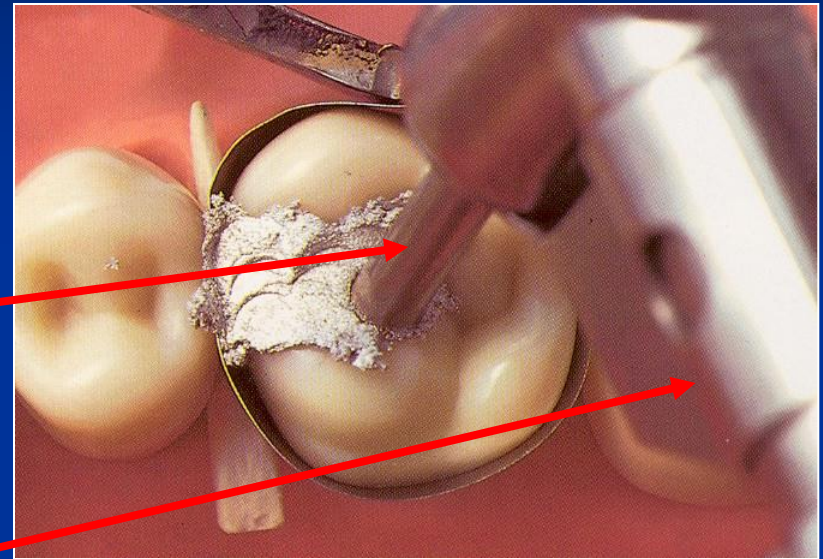


Condensor and burnisher - spatula combined



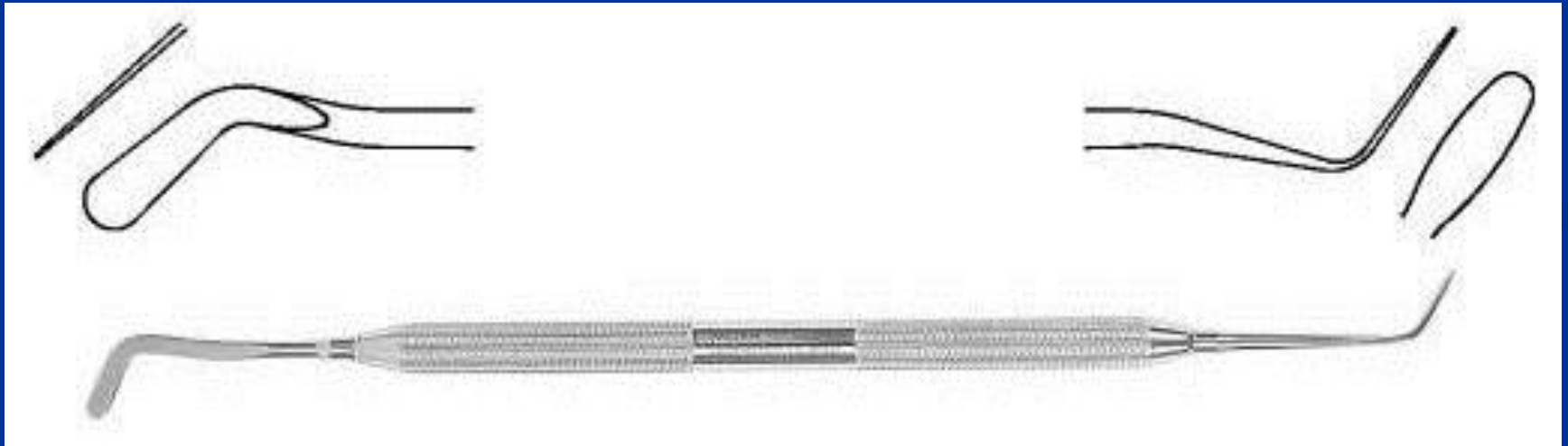
Power driven
condensor
- stamen

Special
handpiece

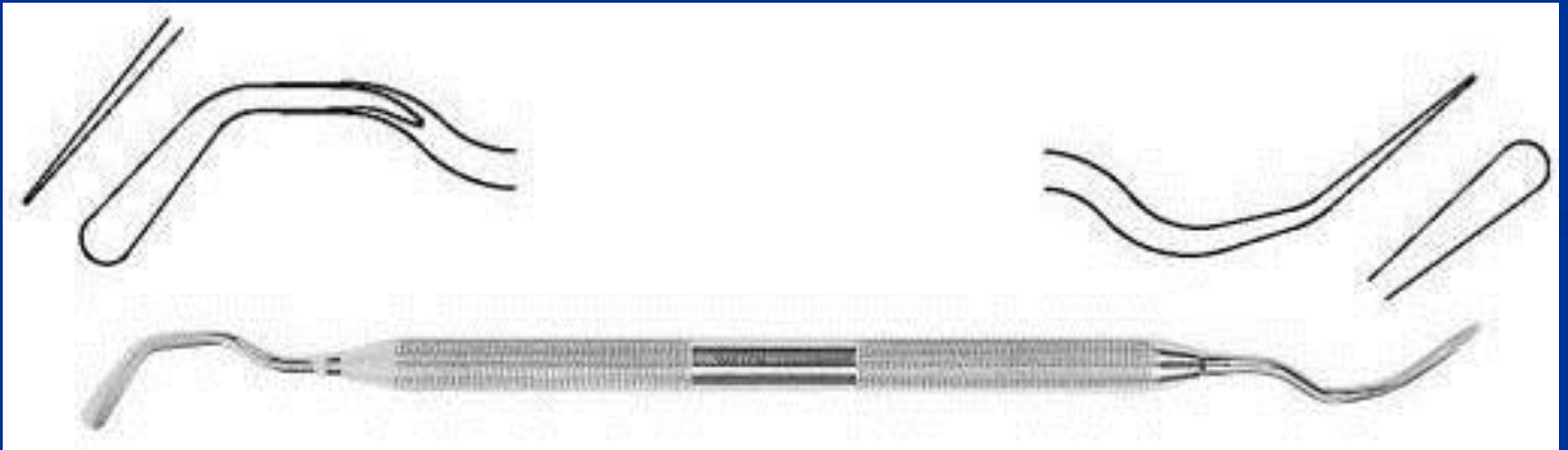


Burnisher - spatula

Angular- trough edge trough face



Burnisher – spatula, angular three face



Instruments

- **Burnishers**

Ball condensor – used as a burnisher at most

