

# Prosthetics II.

Fixed dentures  
Inlay, root canal inlay

# Fixed dentures

- Cemented (fixed) on/in pilots, abutment teeth.
- Inlays (inlays, onlays, overlays, partial crowns).
- Crowns
- Bridges

# Inlays

Composit, cermic

Metal





# Fixed dentures

- Cemented on the teeth – crowns, bridges, inlays



Fixed bridge

# Fixed dentures

- Material – metal alloy, ceramics



# Removable dentures

- Partial
- Complete (full)



# Procedures

- In dental surgery
- In dental laboratory
- Special instruments
- Basic (main) materials  
*(metal alloys, ceramics, polymers)*
- Auxilliary (accessory) materials  
*(impression, carving, die, insulating investing, grinding, polishing)*



# Manufacturing of dentures

Model of gypsum (plaster) – model of a denture (wax pattern).

Model of a denture (wax pattern) directly in the mouth – rarely.

Denture is formed without a wax pattern in the dental lab.

# Manufacturing of dentures

Model of gypsum (plaster) – model of a denture (wax pattern).

# Impressions of the jaw - negativ

The impression is filled with a casting material (gypsum) – poured into



Model  
(various purpose)

# Models

- Working model – the denture is produced on this model (special procedures)
- Opposing model (antagonal) - necessary for the recognition of intermaxillary relationship
- Bite registration - wax

# Manufacturing of dentures

- The denture (not the denture itself but the model of the denture) is produced on the working model.
- The model of the denture is made of the carving wax.
- The wax is replaced by the main (base) material.

# Manufacturing of dentures

The model (wax) of the denture is invested

The wax is removed from the form and the base material is placed into the form.

*Wax removal:*

*The wax is burned out (for metal alloys)  
or removed by hot water (for polymers)*

# Manufacturing of dentures

- The denture is made on the working model.

This is an indirect method.

Indirect method requires impression.

# Manufacturing of dentures

## Indirect method

Indirect method requires taking impression.  
The denture is made in dental laboratory.



# Manufacturing of dentures

The denture is made without any impression

This is direct method

Direct method does not require impression

# Manufacturing of dentures

## Direct method

No impression

The model of the denture is made directly in the mouth (of special wax or resin)

For some cases only

# CAD CAM method

- The denture or its part is made using special devices.

The treated area is scanned directly in oral cavity or on a model (SCANNER)

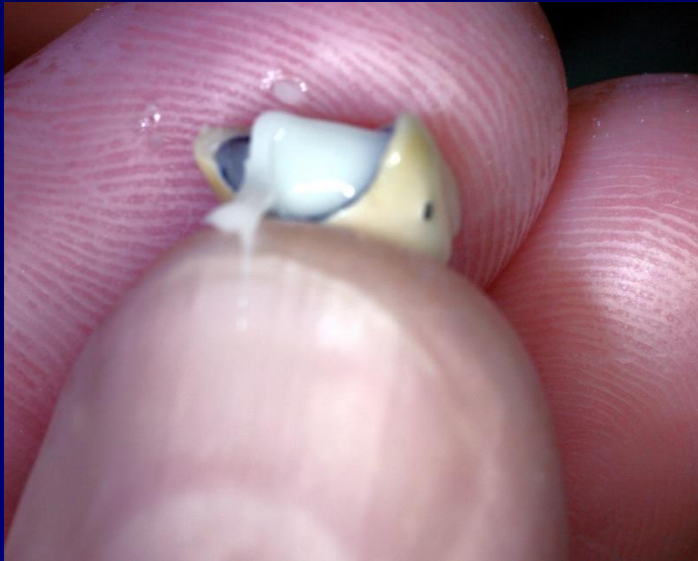
The denture is planned in computer

The denture (or its part) is made by computer assisted procedure – cutting or sintering (SPECIAL DEVICE – MILLING MACHINE OR SINTERING MACHINE)

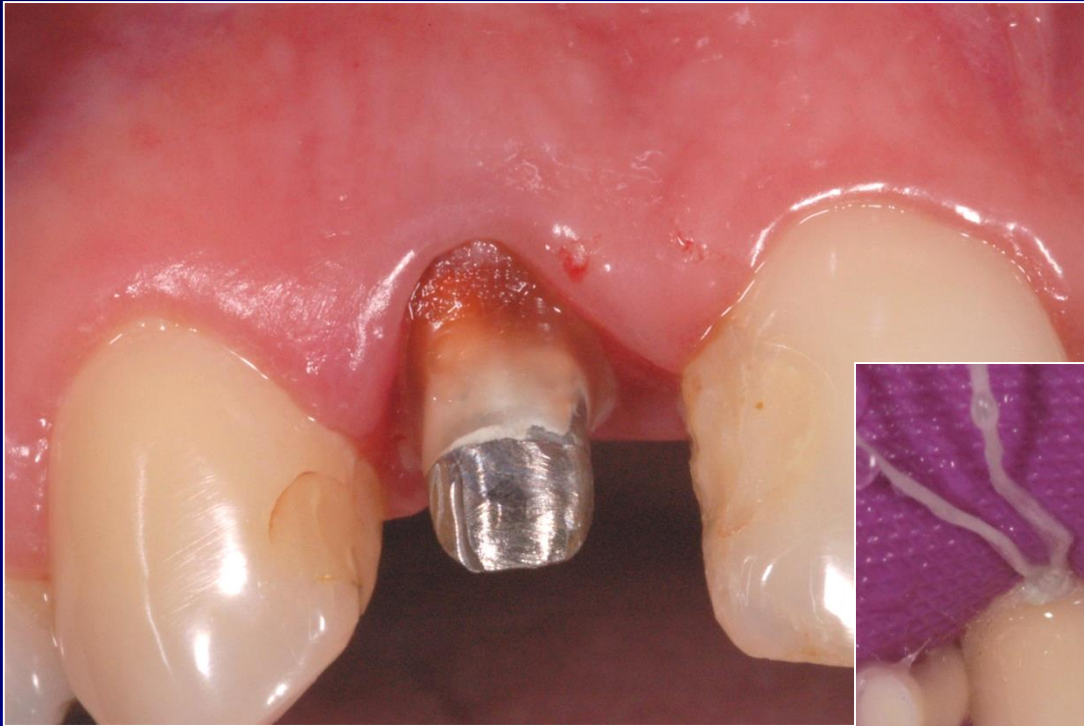
# Inlays



# Crown and its cementation



# Root canal inlay and crown



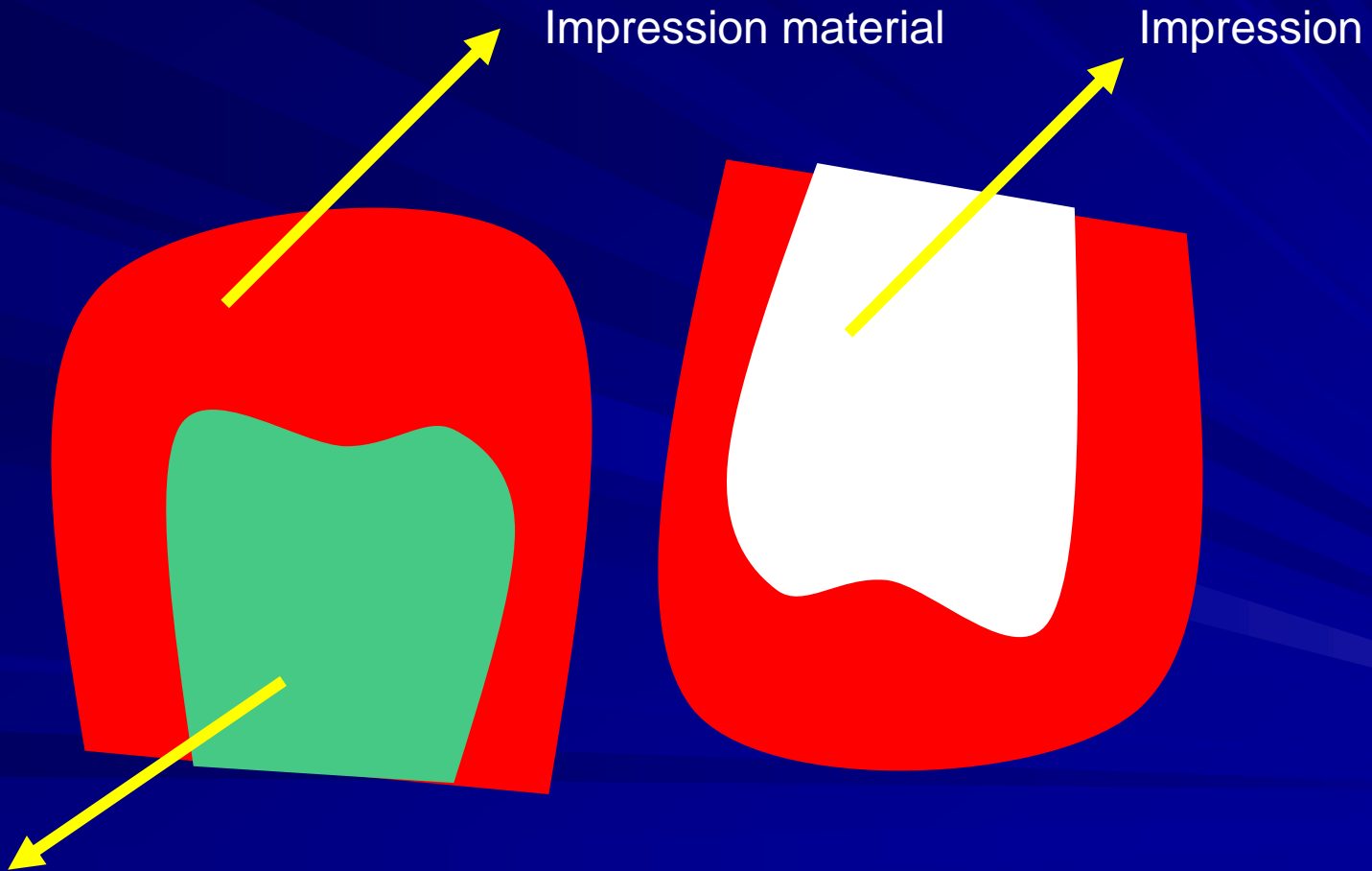
# Bridge



# Removable partial dentures, complete dentures







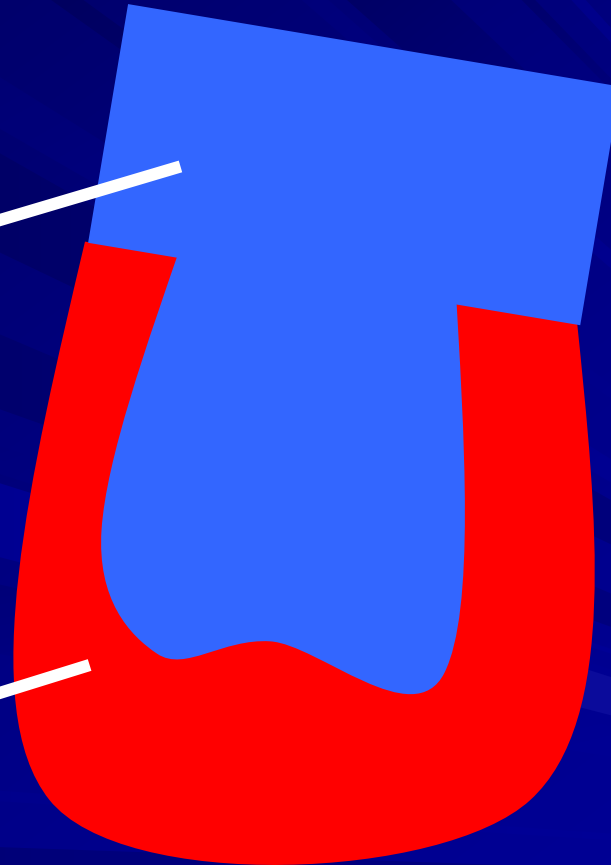
Impression material

Impression

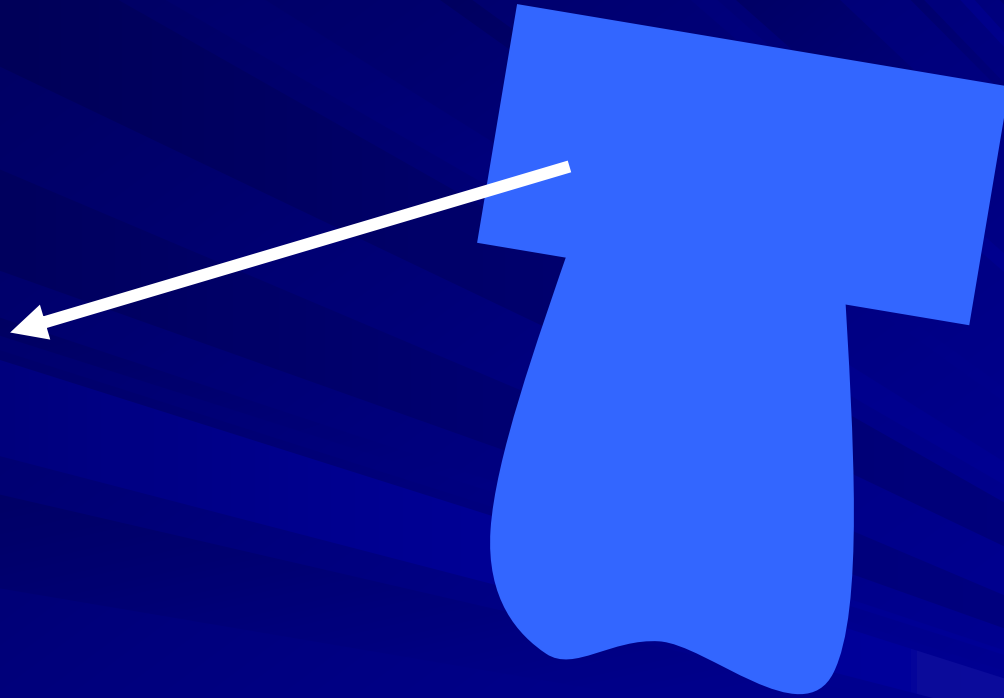
Tooth

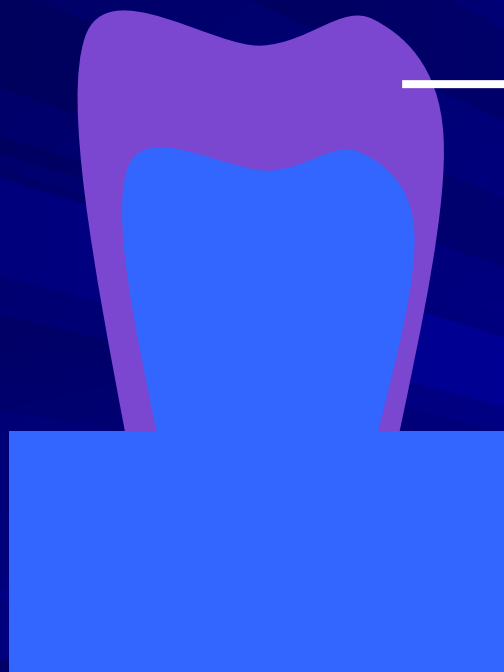
Gypsum

Impression

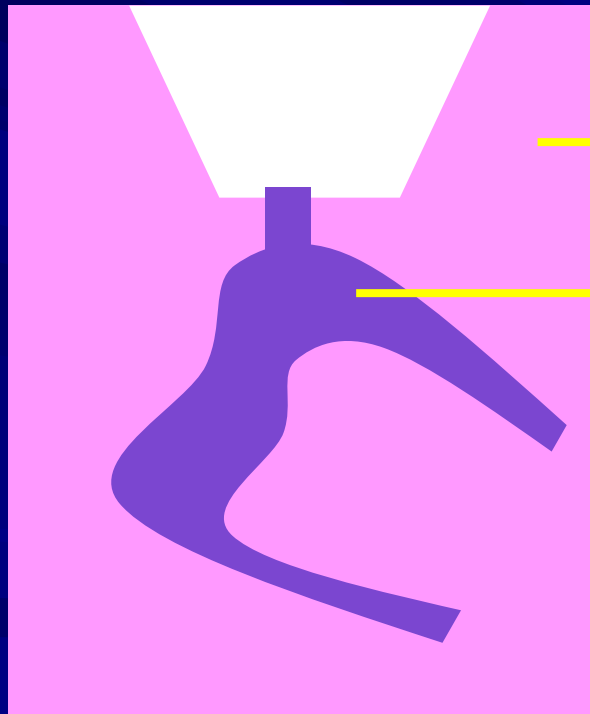


Plaster



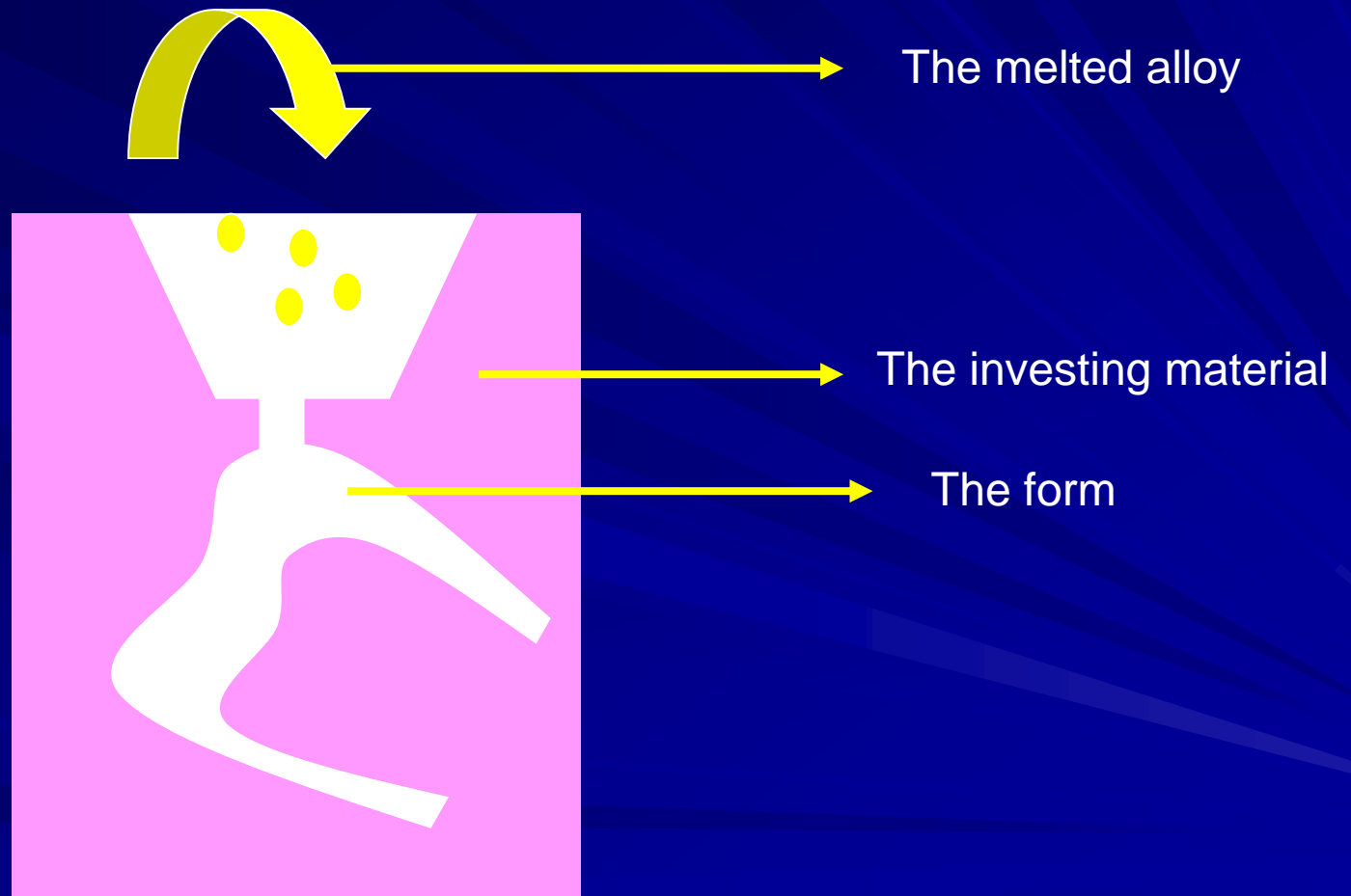


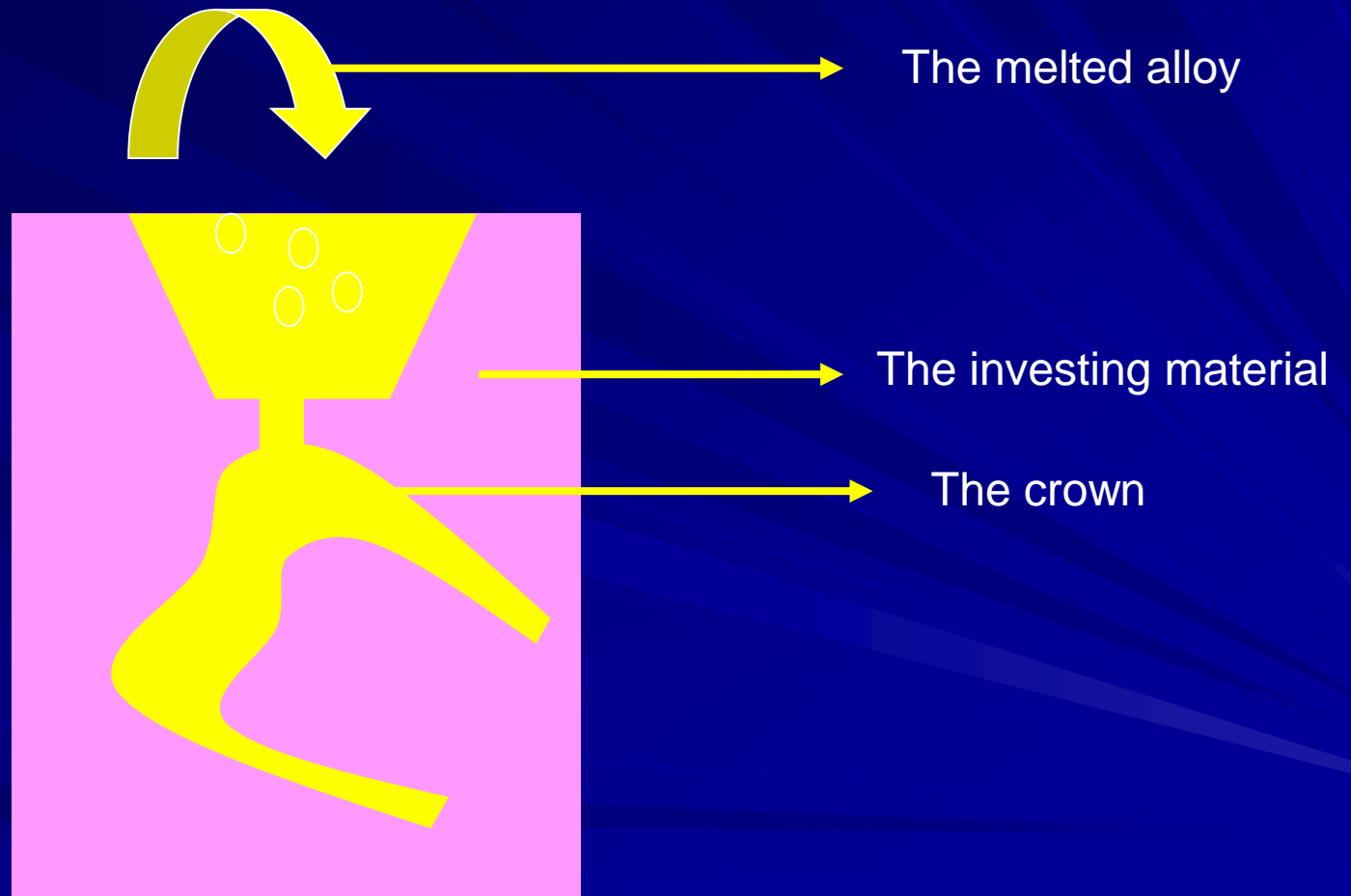
The model (wax pattern)

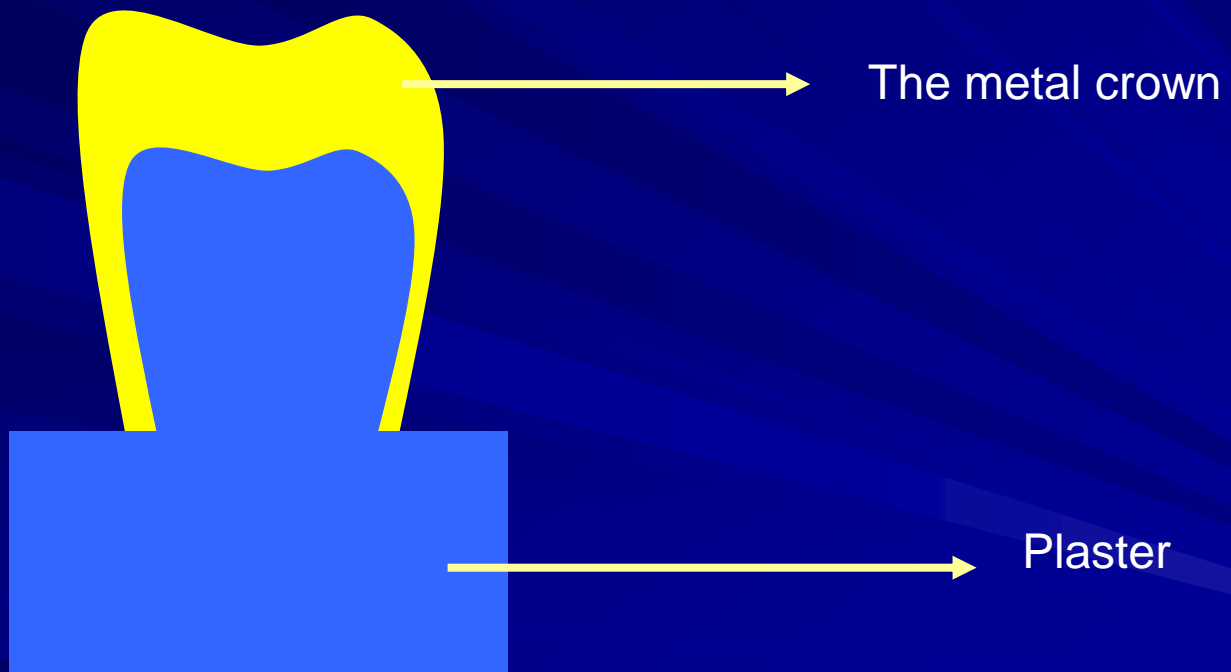


The investing material

The model  
(wax pattern)









# Manufacturing of dentures

The method described above = indirect method



# Manufacturing of dentures

## Direct method

# Manufacturing of dentures

## Direct method

No impression

The model of the denture is made directly in the mouth

For inlays only

# Inlays

- Rigid fillings
- Manufactured in a dental lab
- Direct or indirect method
  - Direct method rarely
  - Indirect method most common

# Inlay

## ■ Crown inlay

- a part of a clinical crown is replaced

## ■ Root canal inlay

- The inlay is cemented into the root canal and replaces a crown (abutment tooth – stump, snag)

# Crown inlay

## Material

- *Composit*
- *Ceramics*
- *Metal Alloys*



# Angle of convergence

- $0^\circ$  - maximum
- $6^\circ$  - very good
- $15^\circ$  - acceptable
- $20^\circ$  - insufficient

Optimum  $6^\circ$  -  $15^\circ$ .

# Crown inlays

## Indications

- A big lost of dental tissues
- Big interdental spaces
- Next to the crowns and bridges made of metal alloy

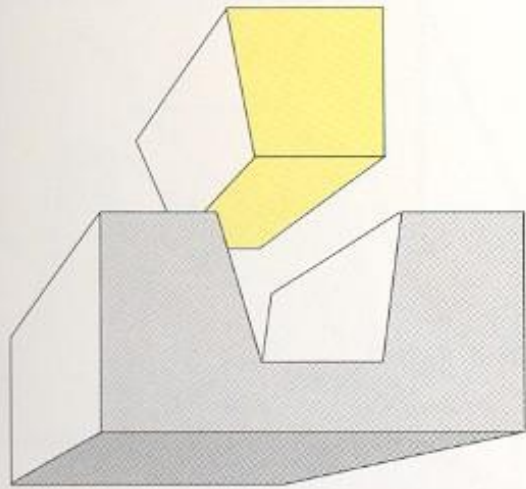


# Crown inlays

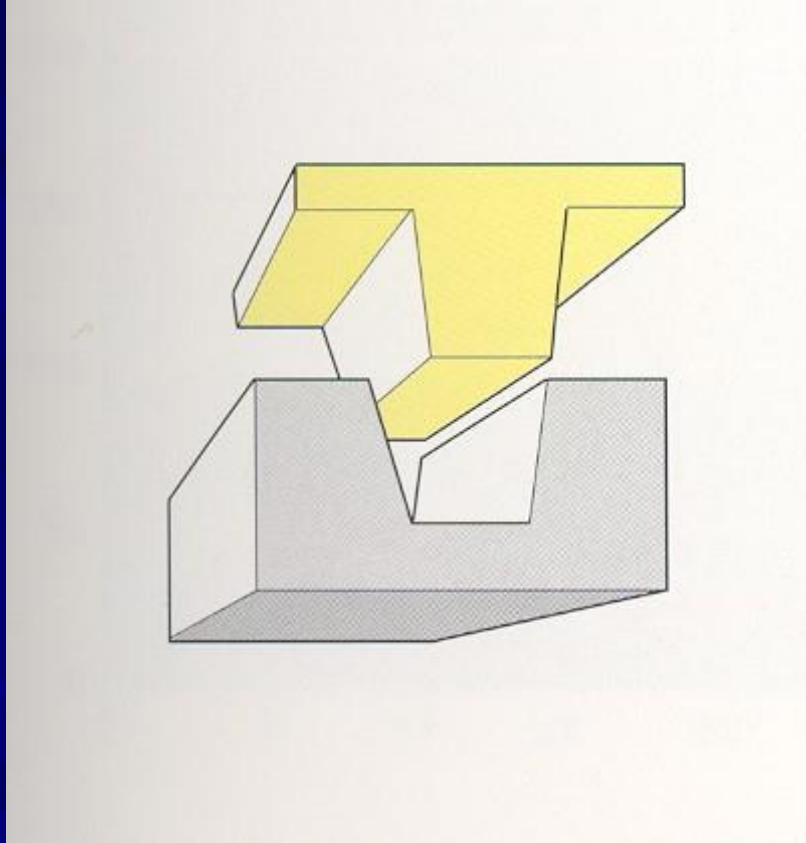
## Contra - indication

1. *Too small - shallow (flat) cavities*
2. *High caries risk*
3. *Frontal area (metallic)*

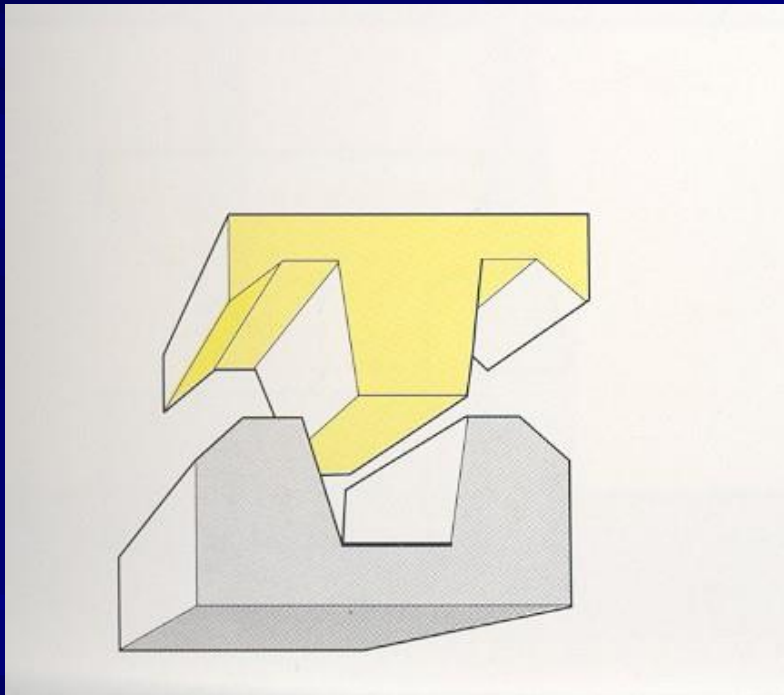
# Inlay



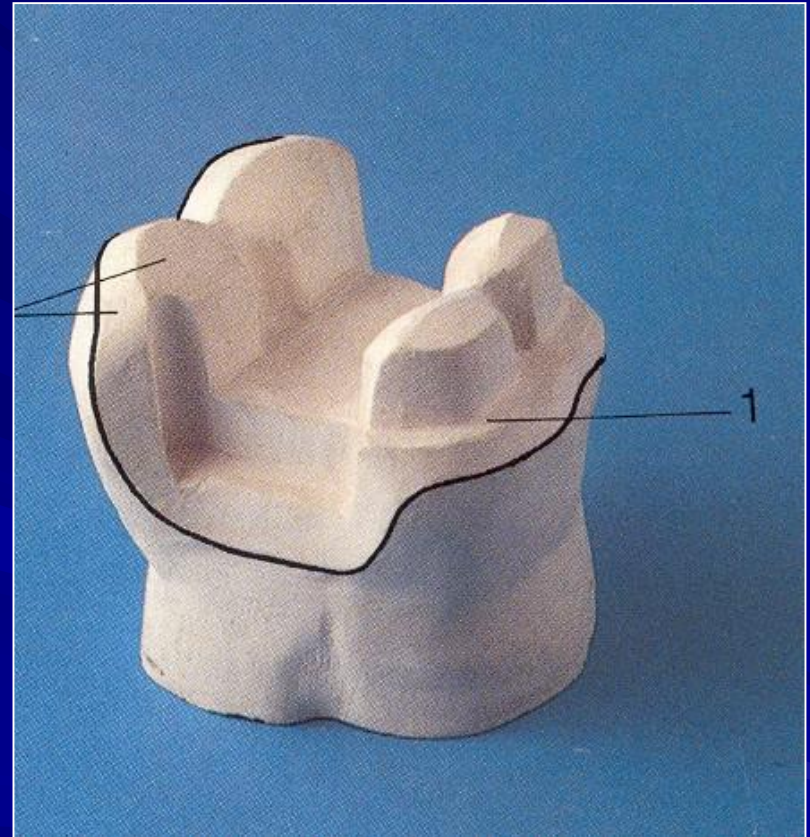
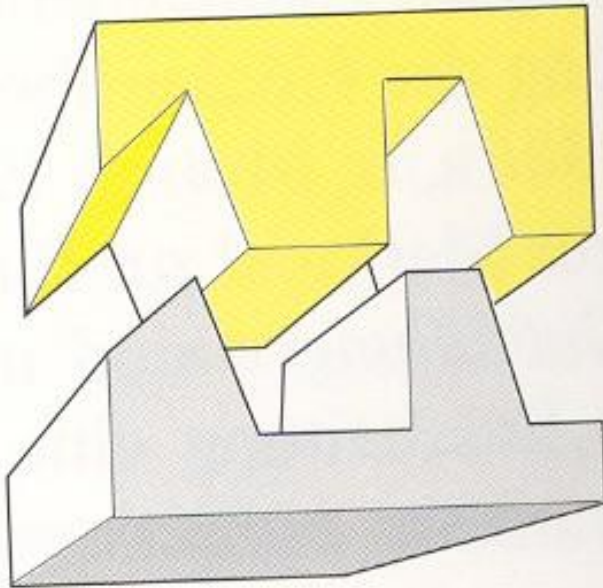
# Onlay



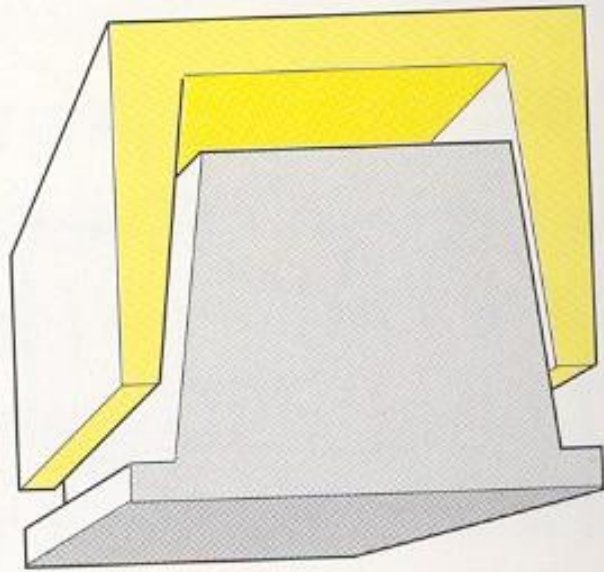
# Overlay



# Partial crown



# Crown



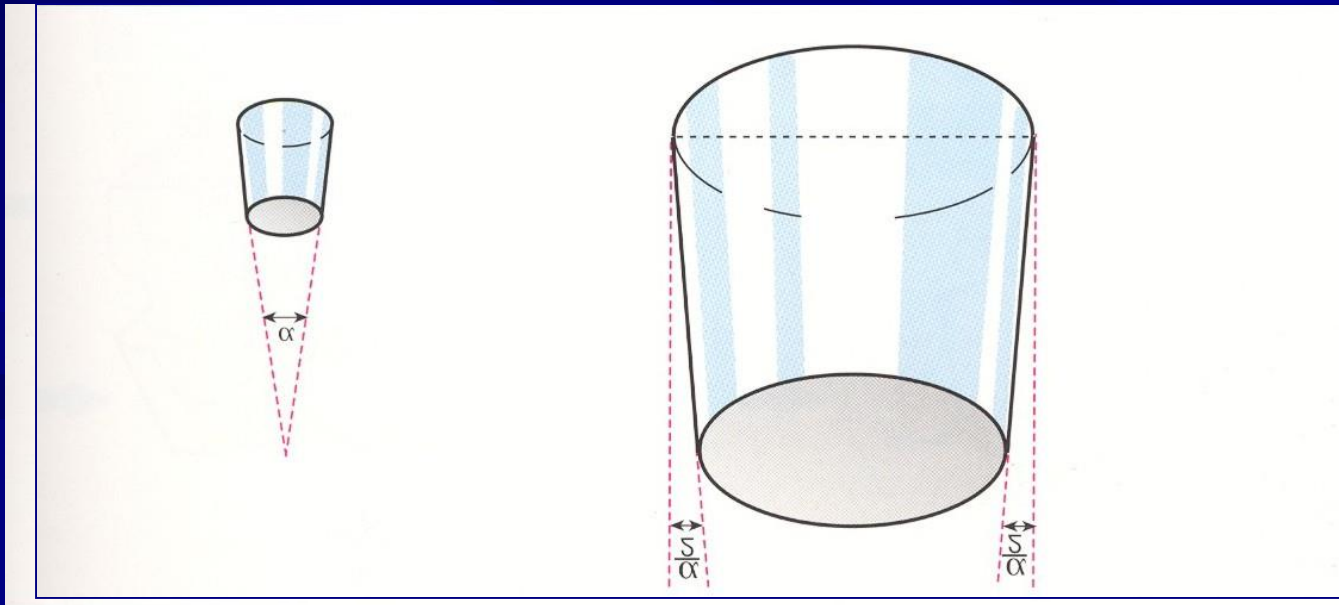
# Retention of rigid fillings

Whitstand capability against axial forces:

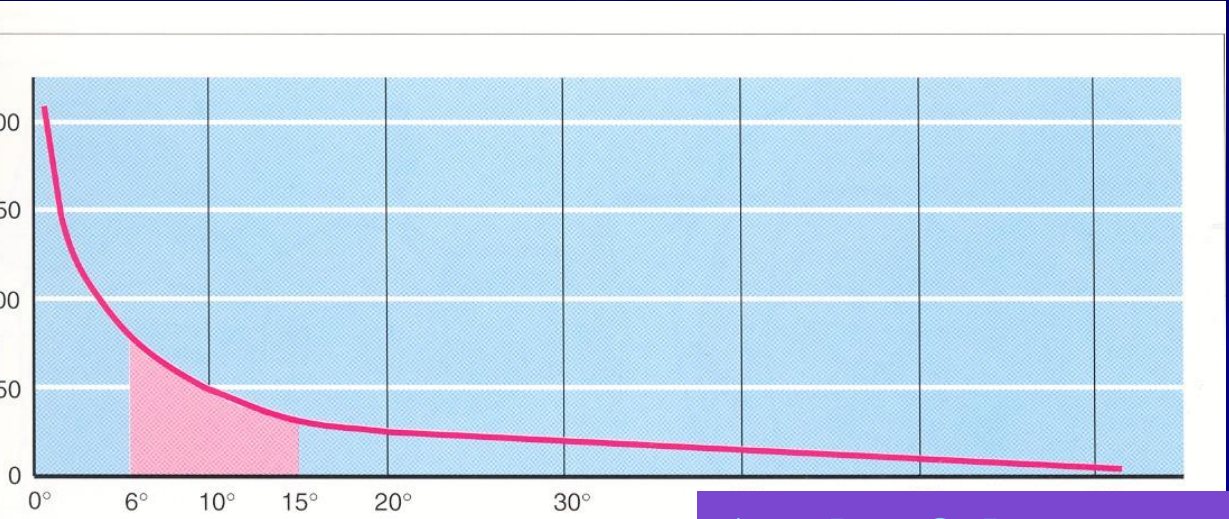
*Geometry of the preparation*

*(facilitating shape)*

*Quality of the luting material*

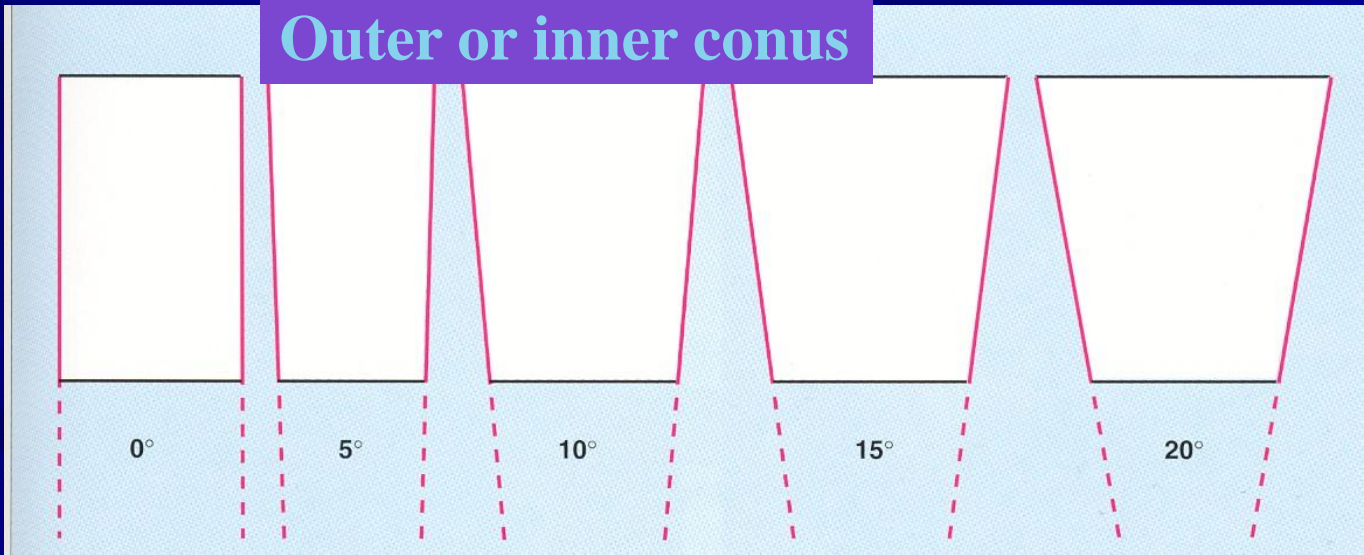


Retention g/mm<sup>2</sup>



Angle of the convergence

Outer or inner conus



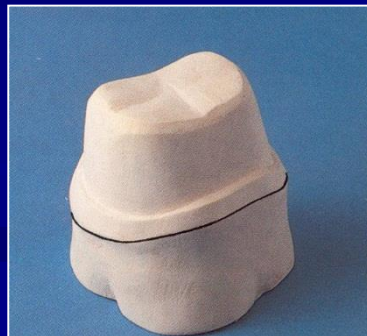


# Retaining areal

- Surface of contact

*Rigid filling*

*Inlay or crown (internal, outer, combined)*



# Stability of rigid fillings

Whitstand capability against horizontal forces

*Angle of convergence*

*Axial length contact surface*





# Basic rules of cavity preparation

➤ Box

➤ No undercuts

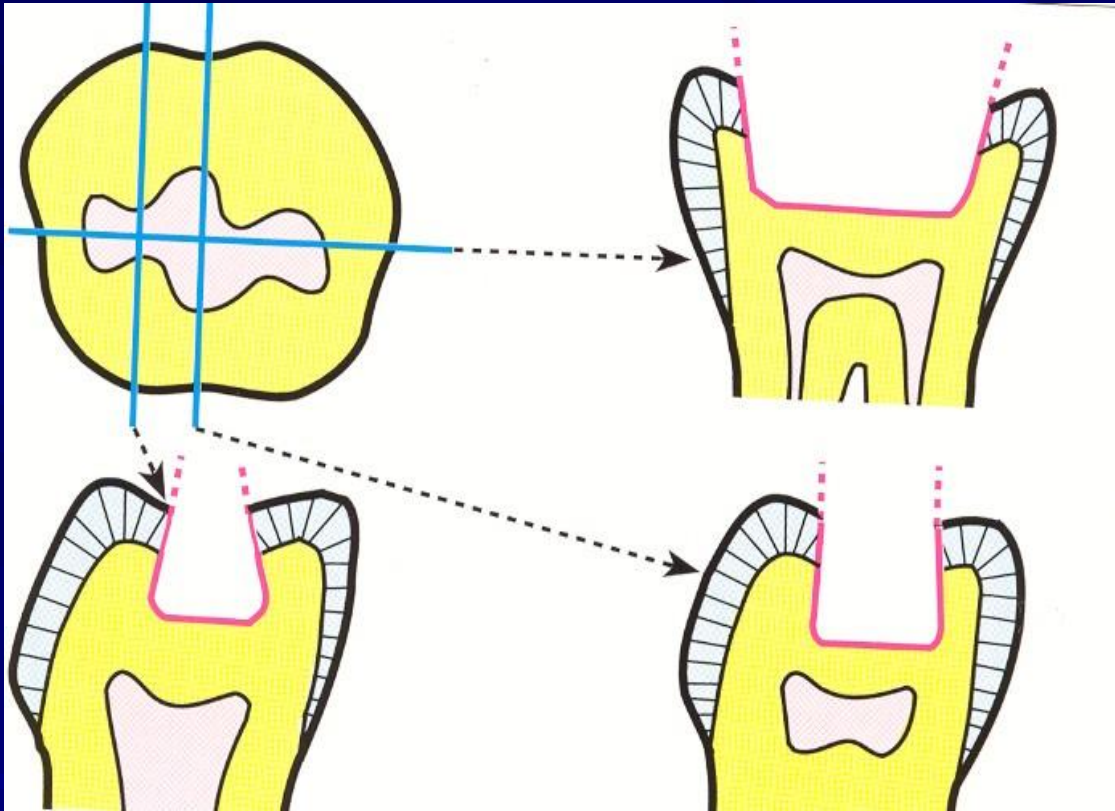
➤ Light divergence of the walls (facilitating shape)

# Box

Undercuts

Simple box

Facilitating form

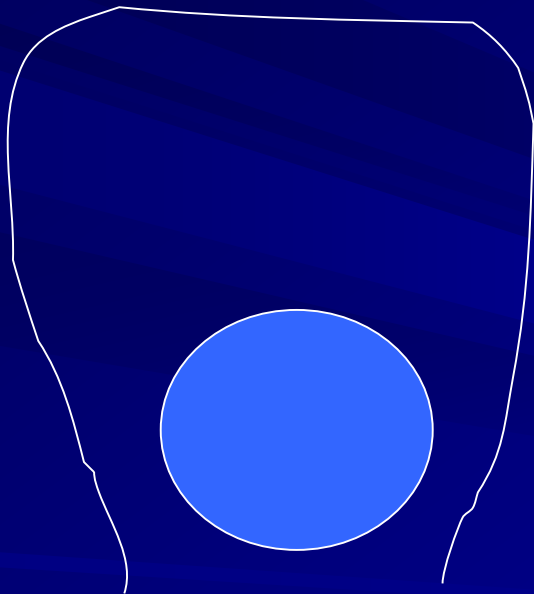


# Inlay of metal alloy

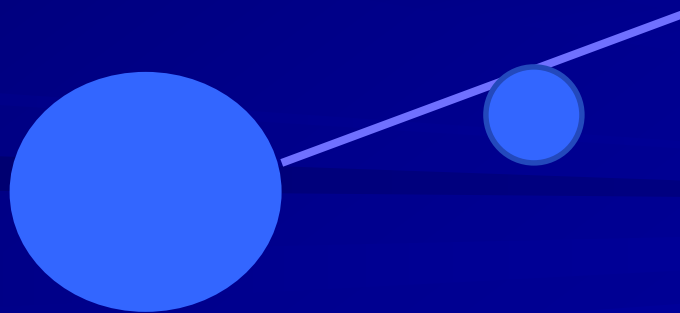
- Direct method
- Indirect method

# Inlay of metal alloy

## ➤ Direct method



*Direct modelling in the mouth*  
*Special wax – casting wax,*  
*(special polymers)*  
*Sprue pin*  
*Investment*  
*Method of the lost wax*





# Inlay of metal alloy

## Direct method

- Central cavities (class I., class V.)
- Root canal inlays

# Inlay of metal alloy

## Indirect method

Taking of the impression

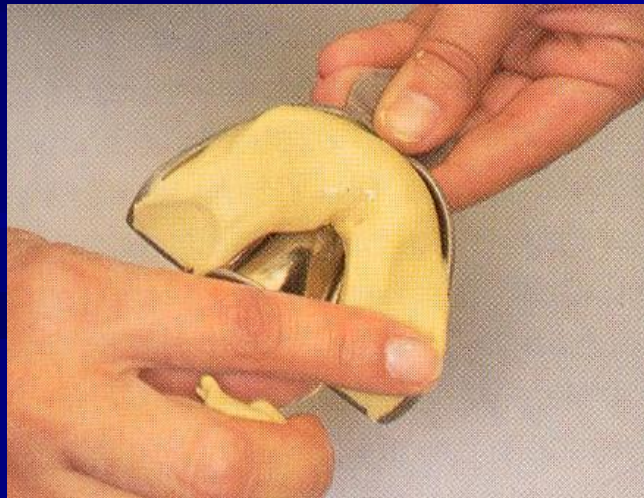
Model

Modellation of the casting wax,  
(special polymers)

Sprue pin

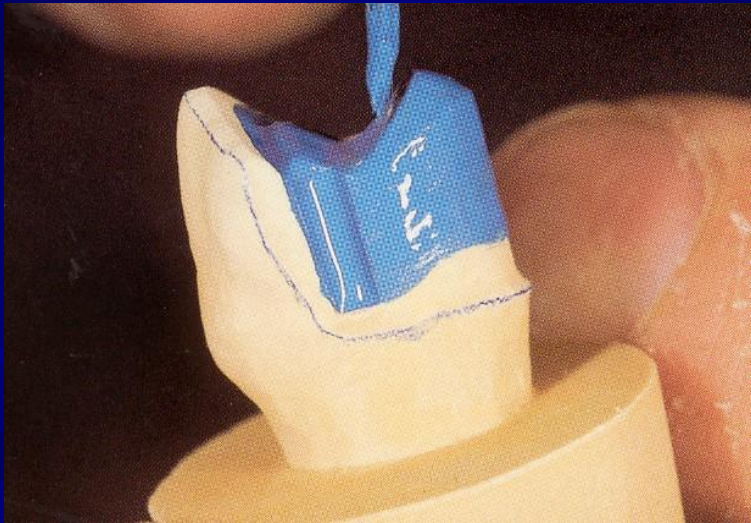
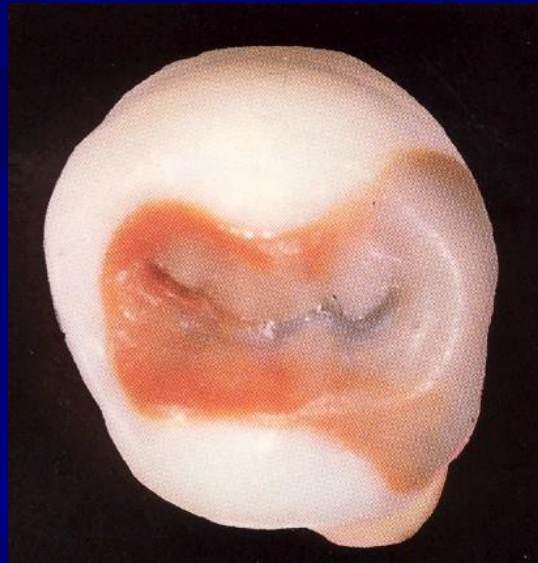
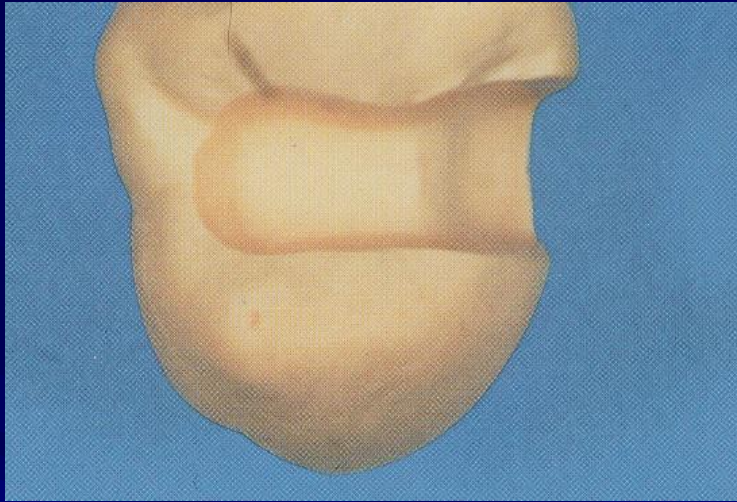
Investment

Method of the lost wax





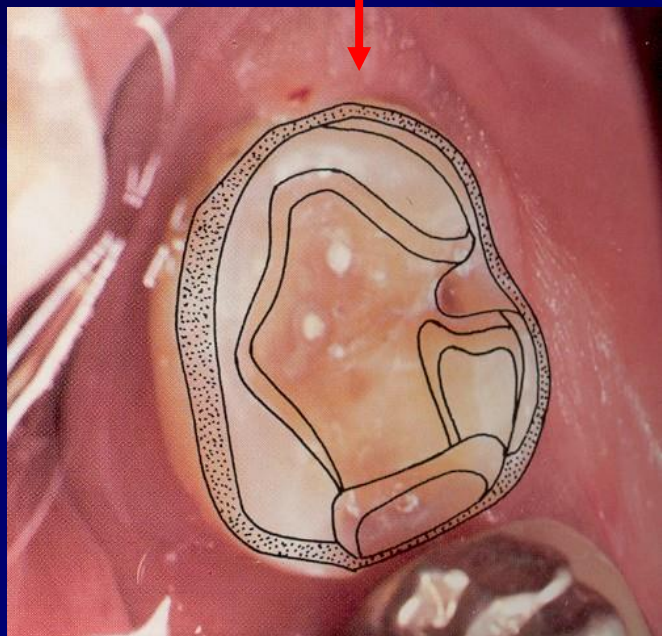




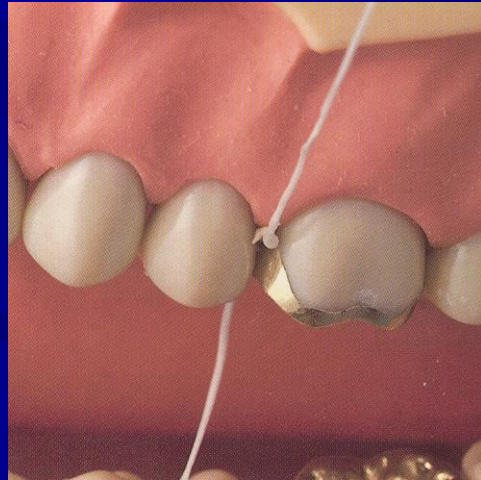
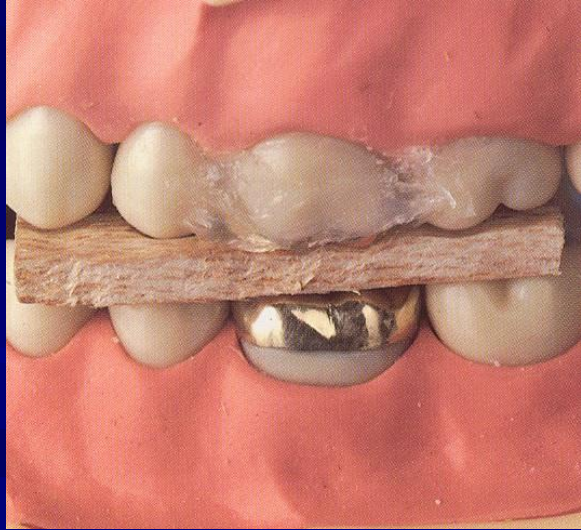
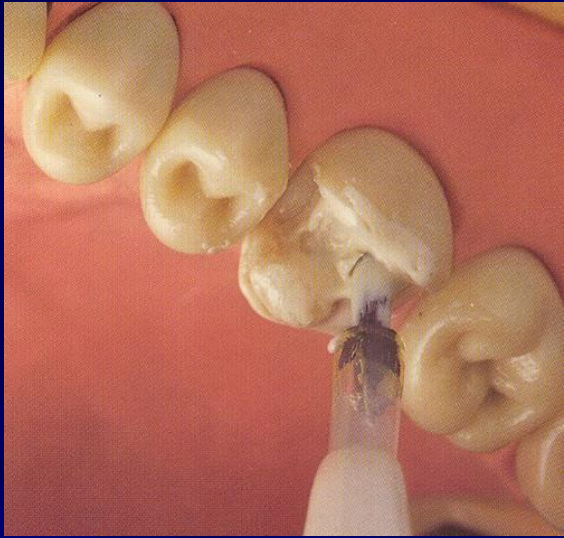


**Dokončená preparace**

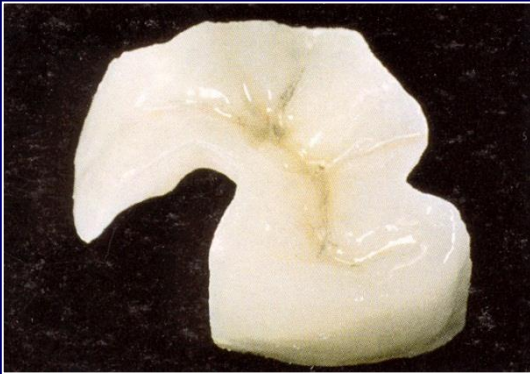
**Nasazená rekonstrukce**







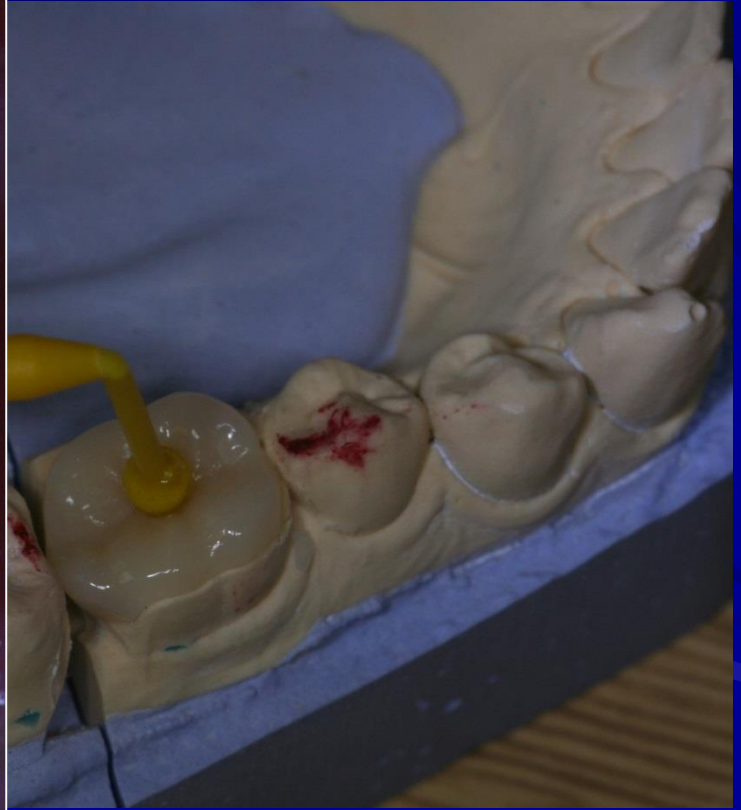
# Aesthetic inlays – composite materials, ceramics



Special procedure



Indirect method always







# Root canal inlay

## Indication :

Restoration for teeth with lost crown  
(cca 2/3 of the crown)

It is anchored in the root canal

(the tooth must be endodontically treated)

The coronal part is formed as a stump for  
the crown

It enables to treat this teeth with crown

# Contraindication

- Teeth that cannot be treated endodontically
- Decay of the root or coronal part of the crown
- Less than 1mm hard dental tissues supragingivally
- Destruction of root canal walls circularly

# Root canal inlay - preparation

- Removal of the root canal filling (2/3), 4 mm of the root canal filling must be left.
- The third rule

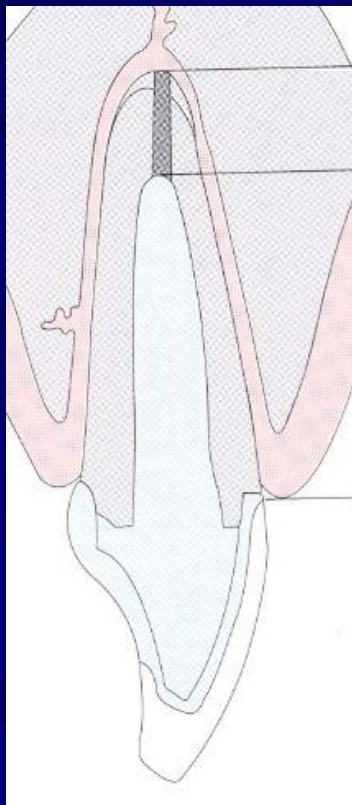


Gates, Peeso – Largo,

Beutelrock – these burs has „flame form“

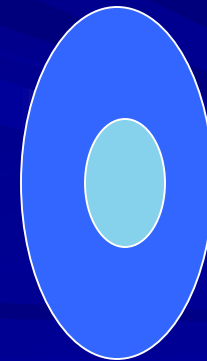


# Post

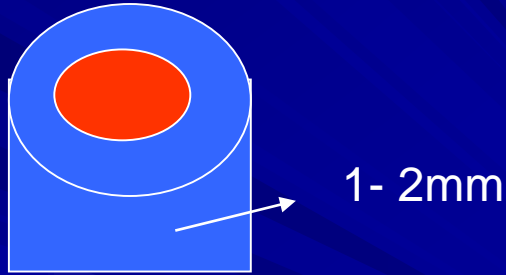
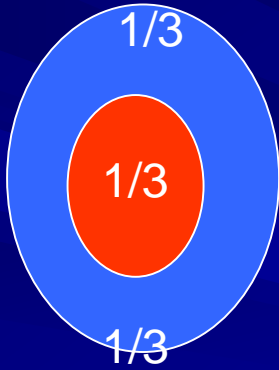


1/3

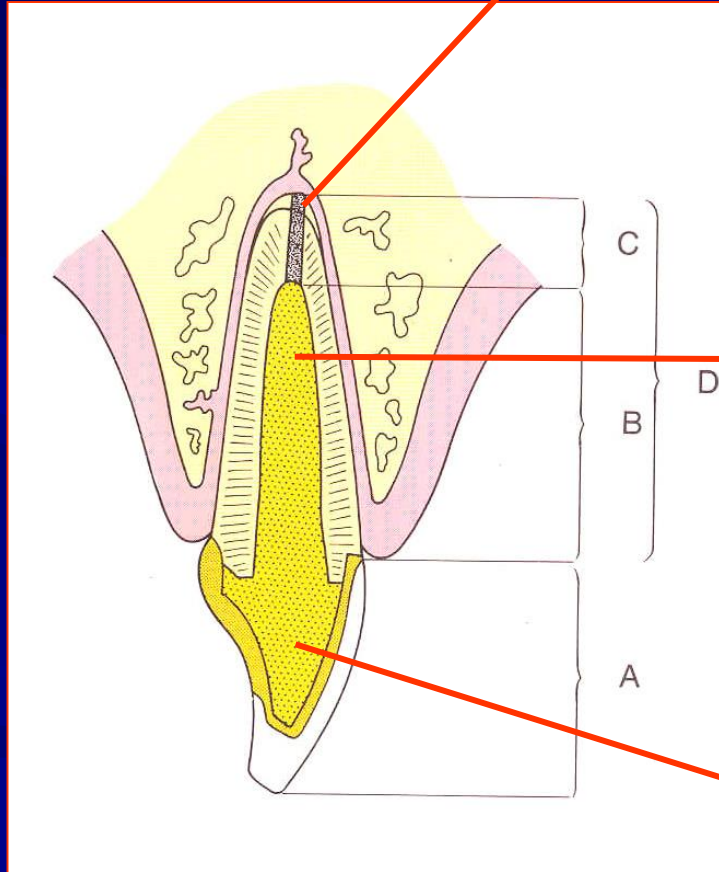
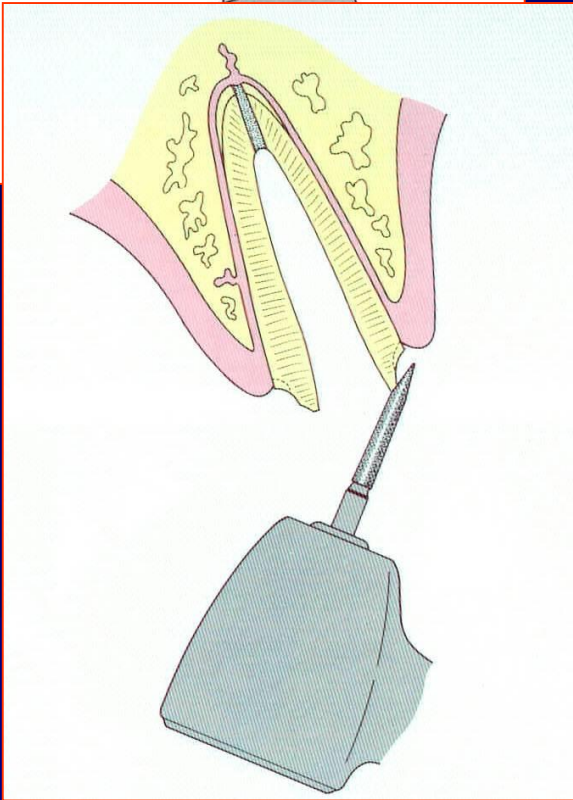
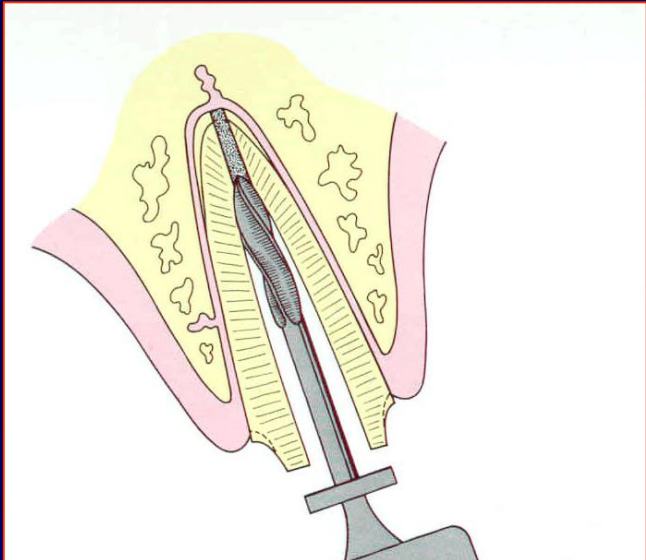
2/3



Schillinburg, Kessler, 1982



# Preparation



4mm at least

2/3 of the  
root canal length

1/4 of the total length

# Direct method

Isolation

Modelling – casting wax,  
heated, flowing

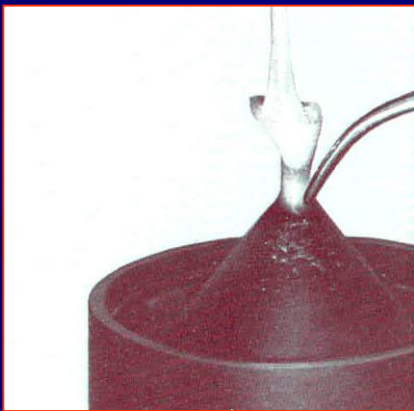
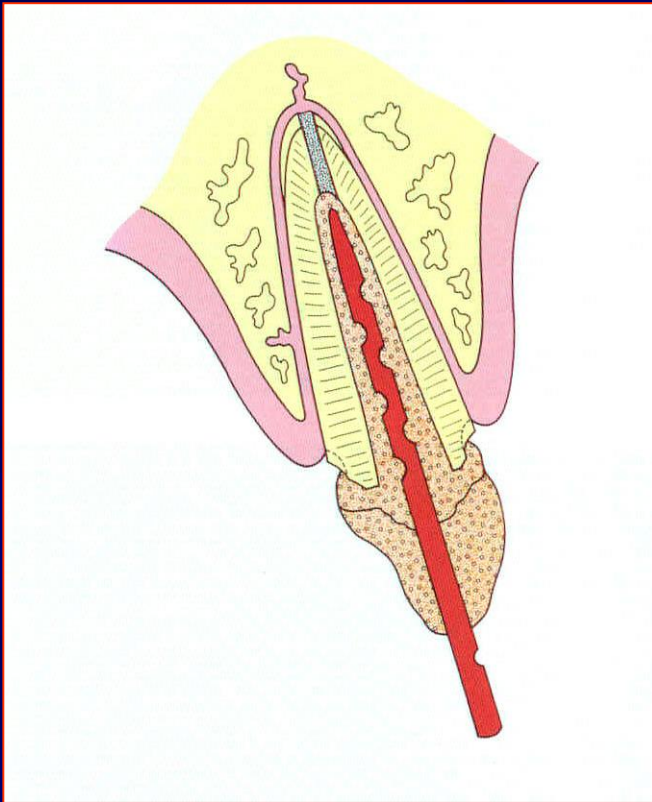
Sprue pin with reservoir

Sprue cone

Investment

Lost wax method

(burntout in the special oven)



# Indirect method

Impression

Model

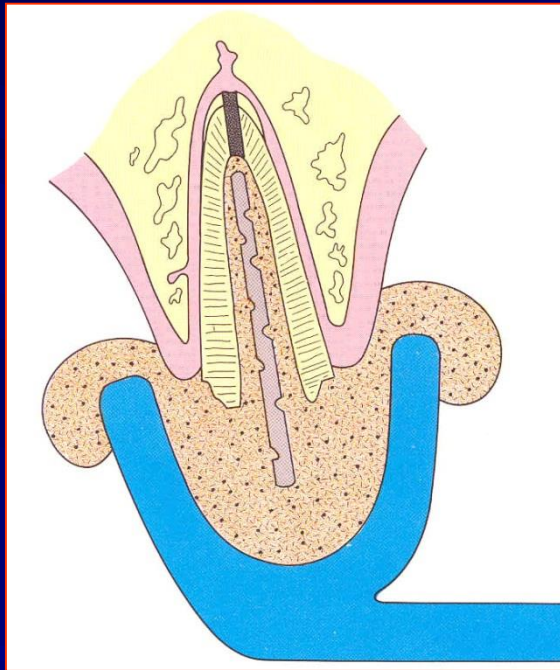
Modelling – casting wax, heated, flowing

Sprue pin

Investment

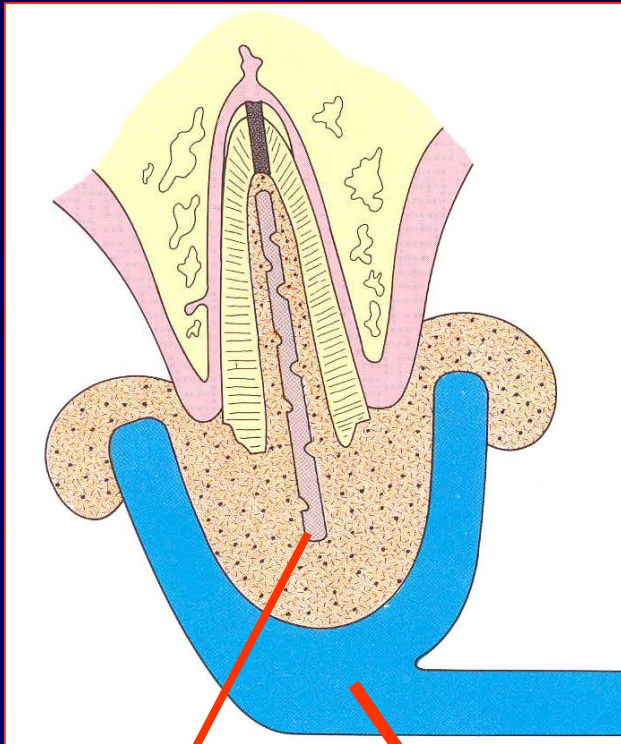
Lost wax method

(burntout in the special oven)



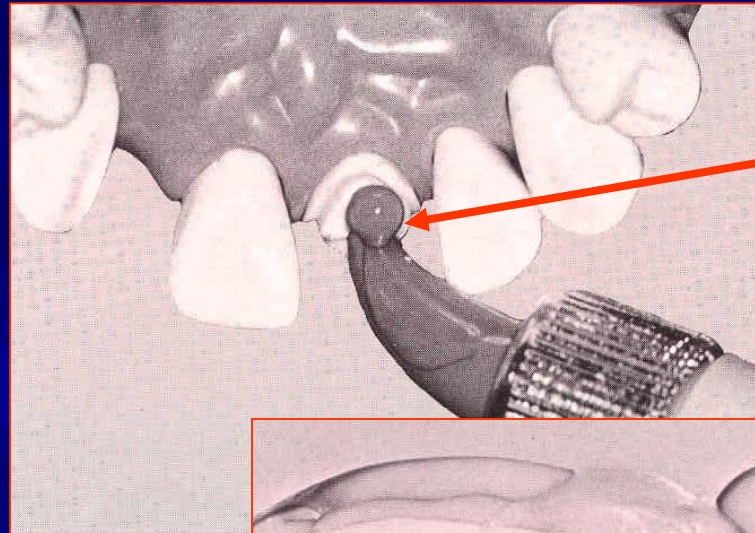
# Indirect method

## Impression

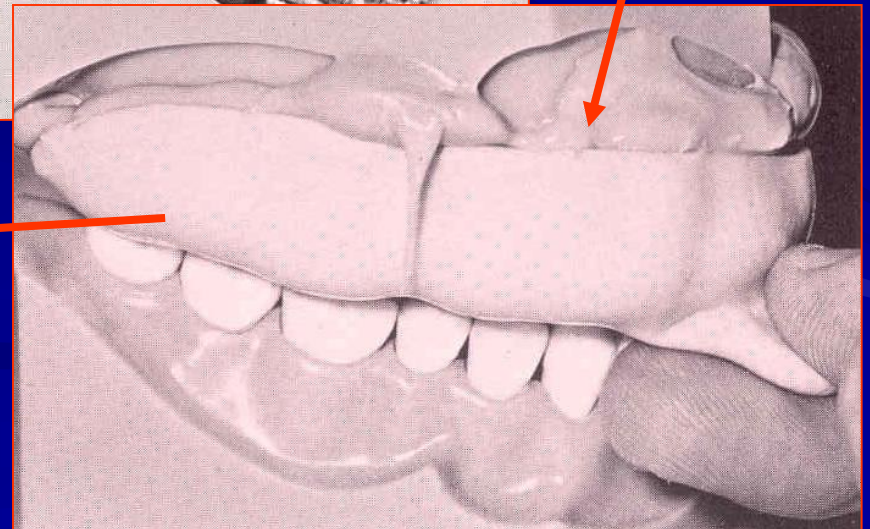


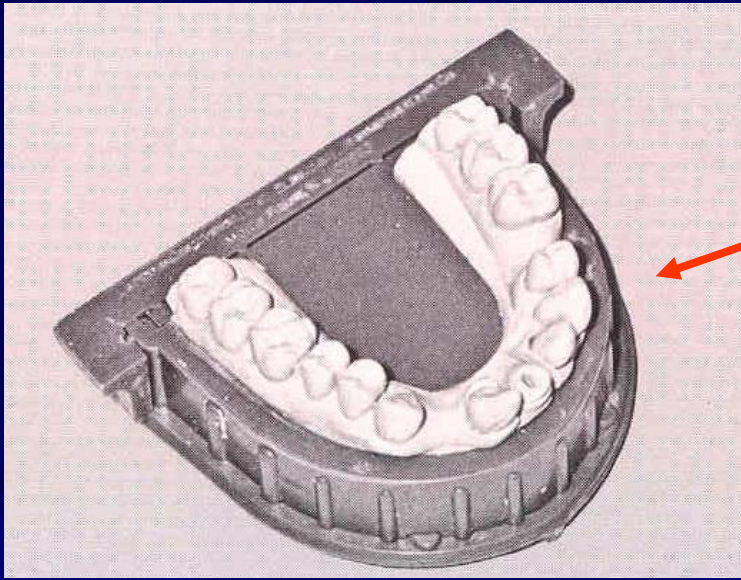
Wire

Impression tray



Impression material

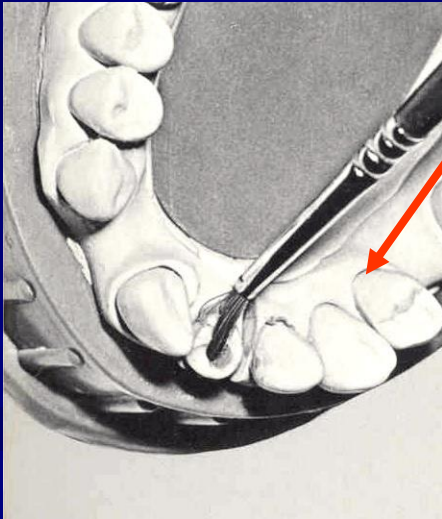




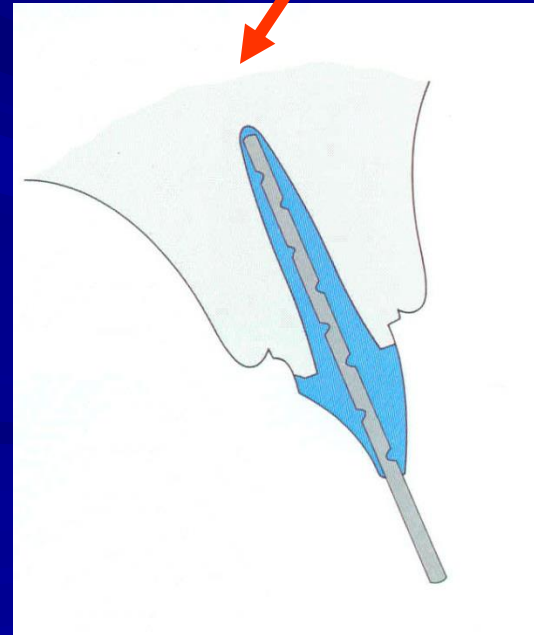
**Model**



**Insulation**



**Modellation**





# Indirect method

Impression

Model

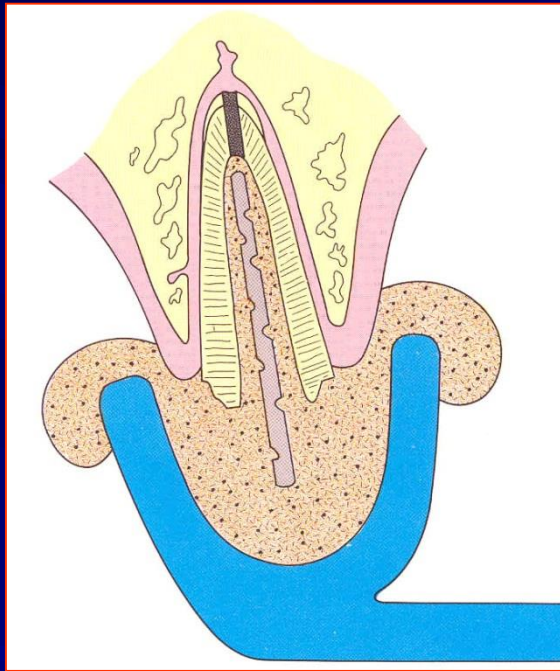
Modelling – casting wax, heated, flowing

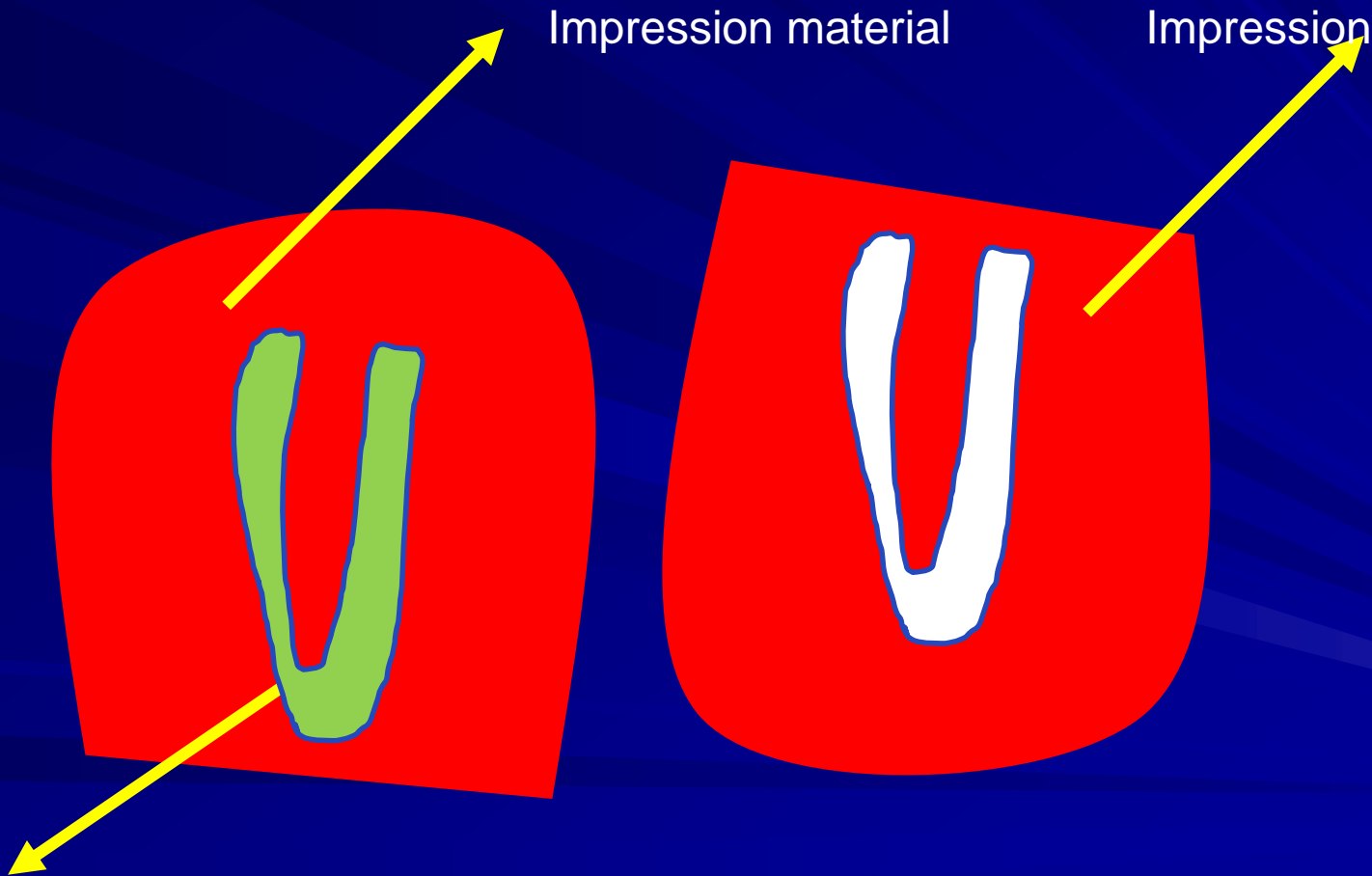
Sprue pin

Investment

Method of the lost wax

(burntout in the special oven)





Impression material

Impression

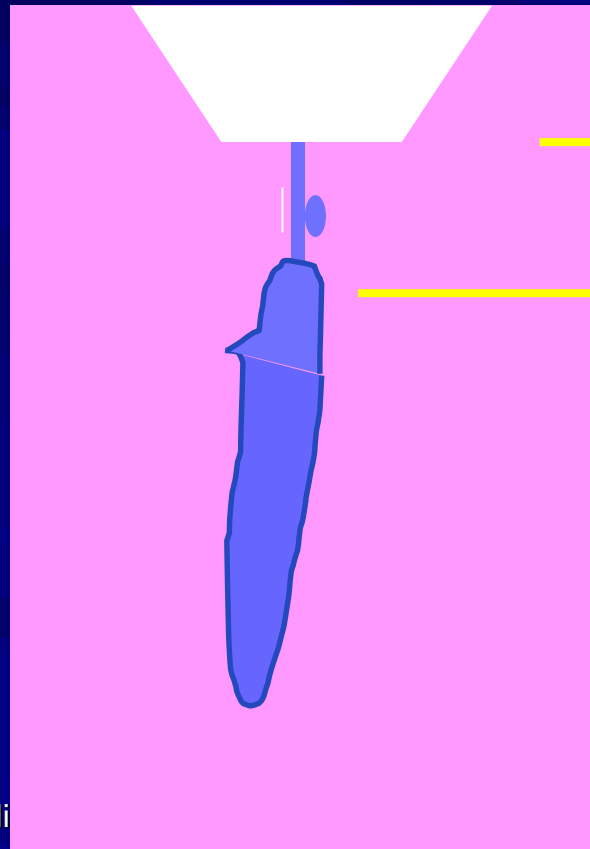
Tooth

lenka.roubalikova@tiscali.cz

Plaster

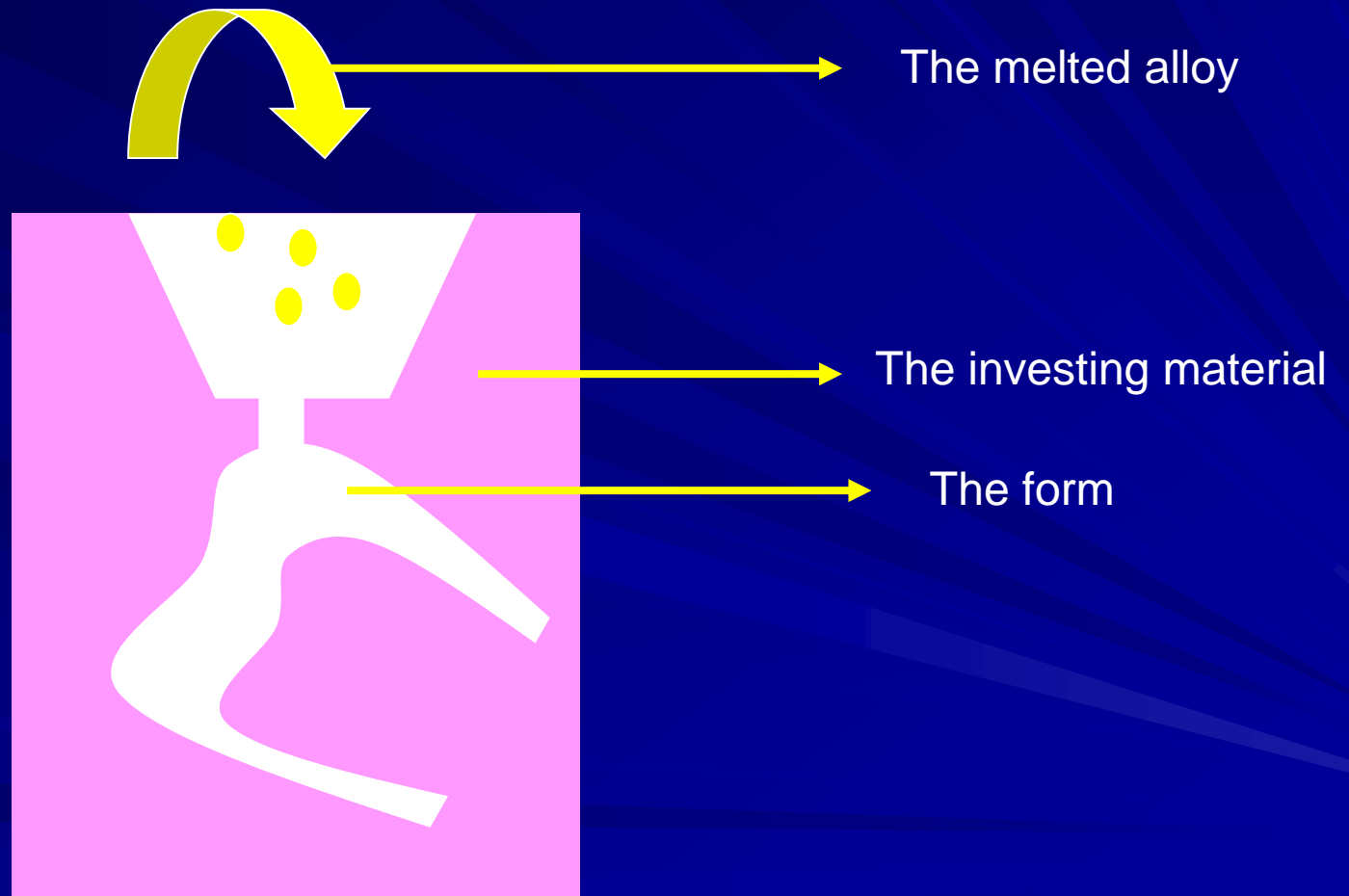


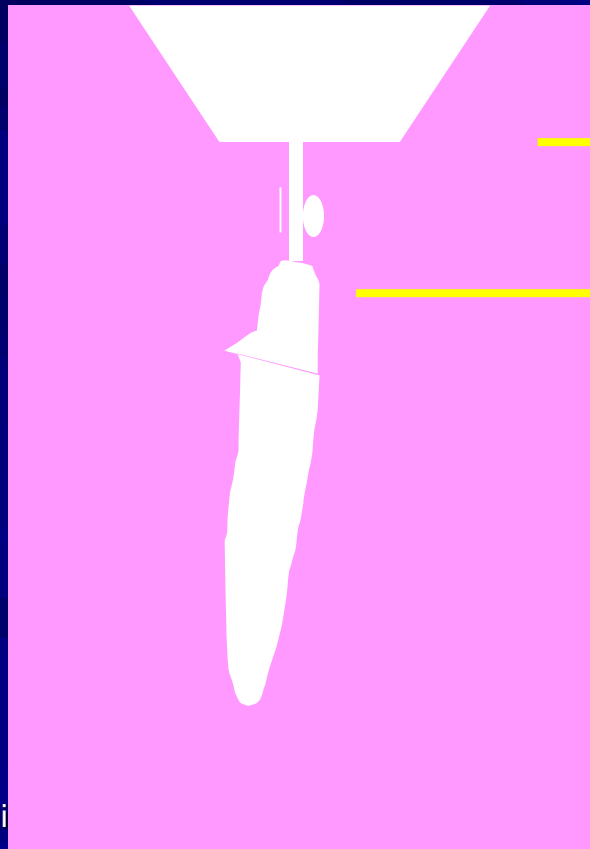
Model



The investing material

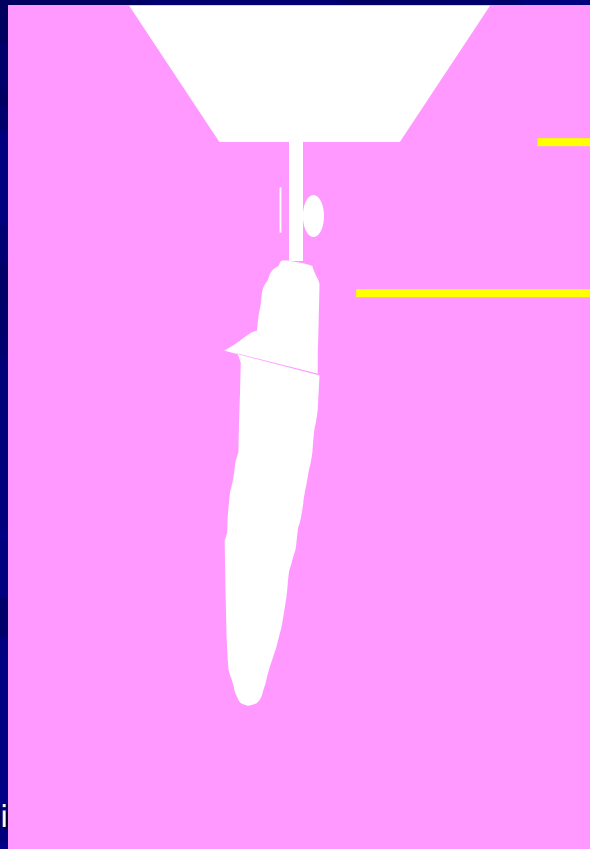
The model  
(wax pattern)





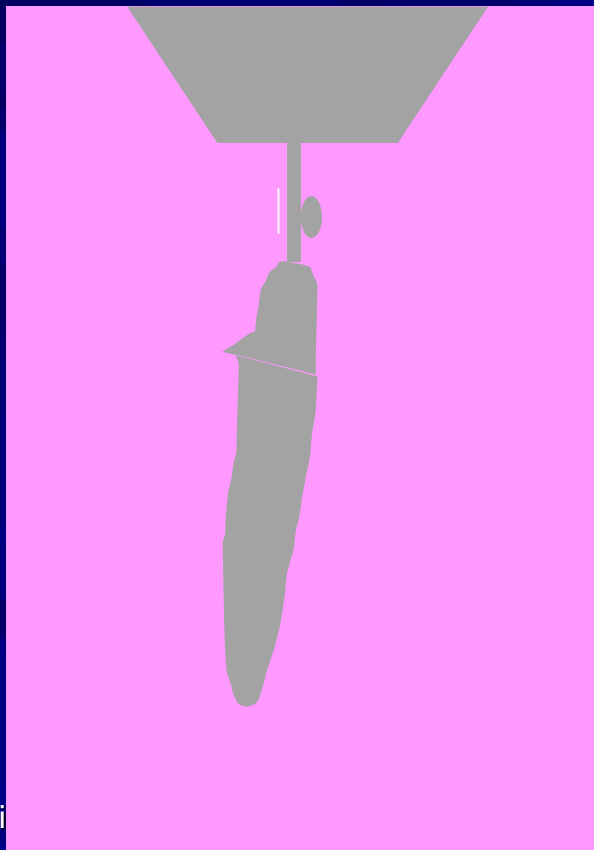
The investing material

The model  
(wax pattern)



→ The investing material

→ The model  
(wax pattern)





## ■ Final product



# Cementation

- Zinkoxid phosphate cement
- Lentulo
- Vaseline
- Removal of access of the cement

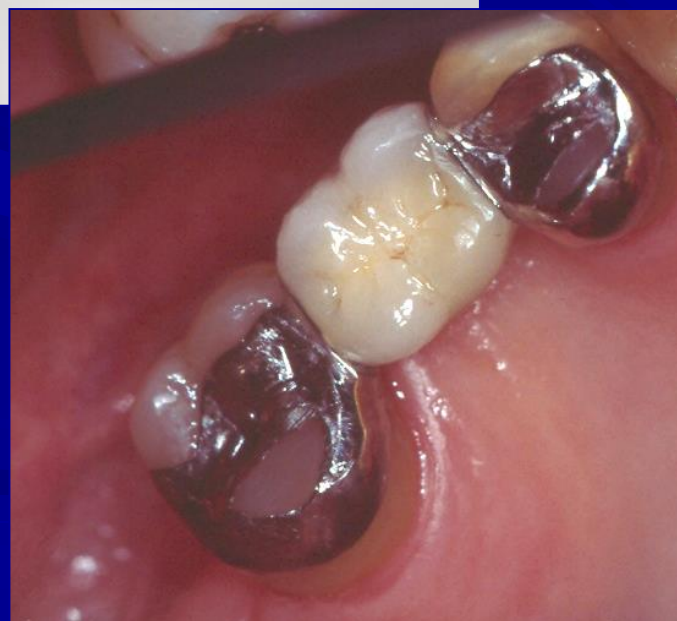








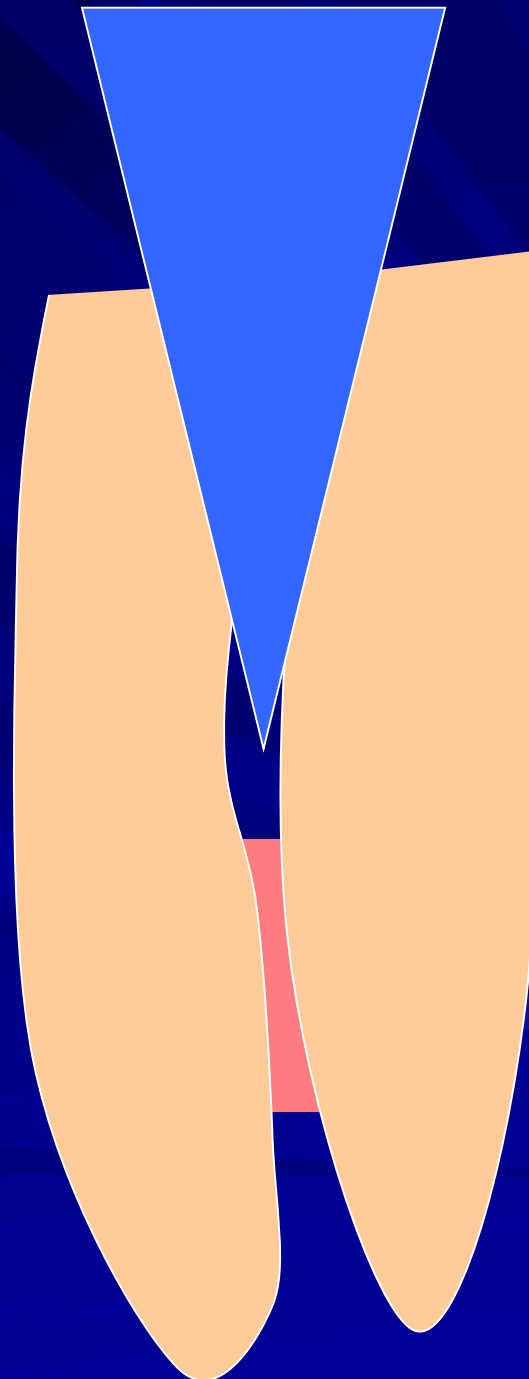
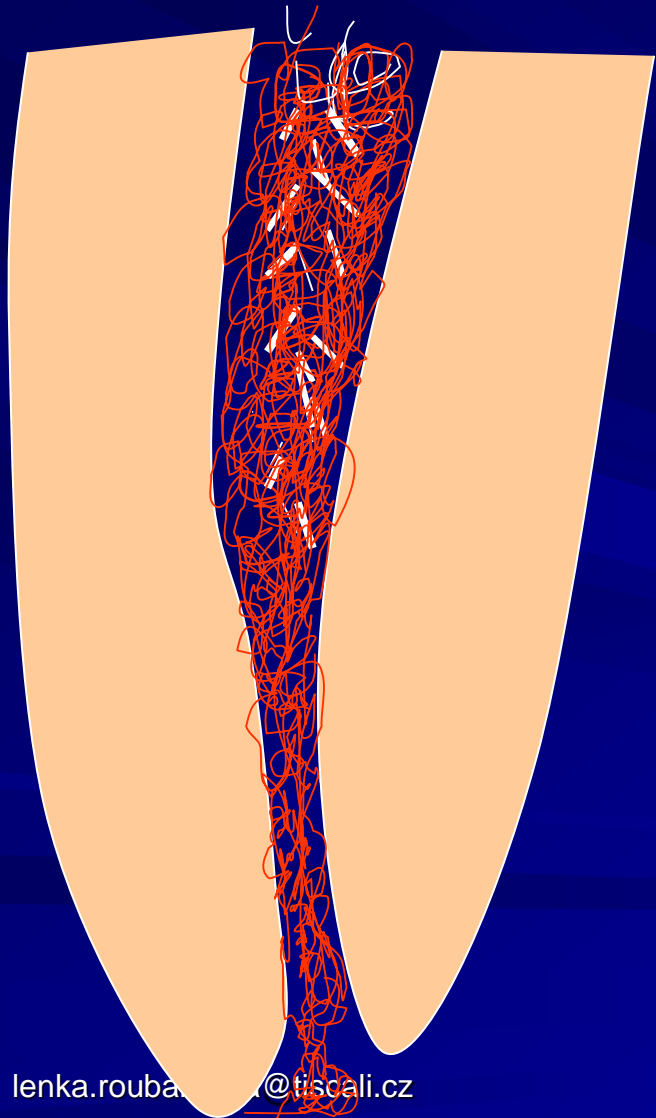








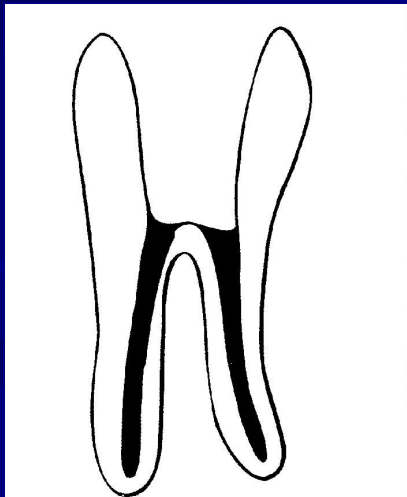
rosol=kov?



# The tooth after the endodontic treatment

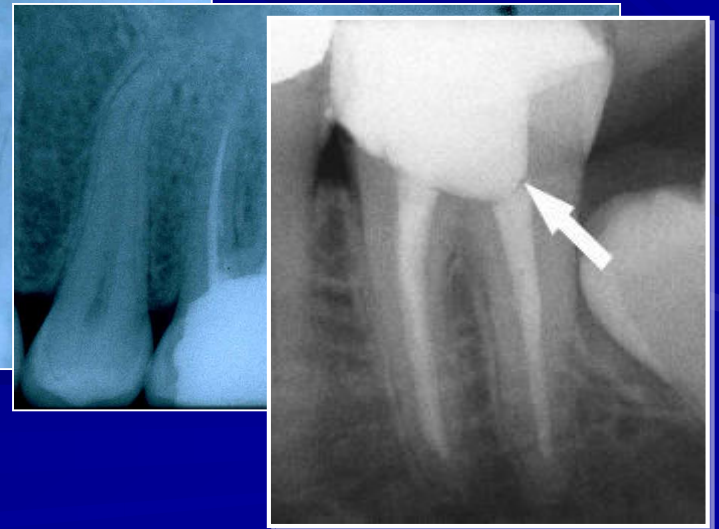
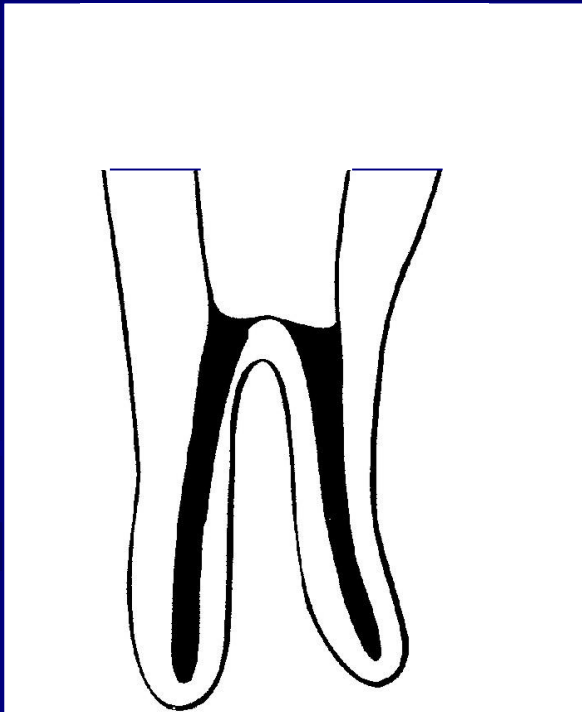
**Risk of**

- **reinfection**
- **fracture**

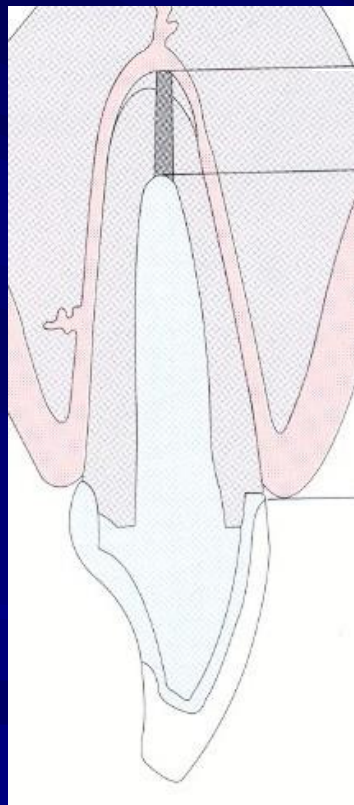


# Myslet na rezistenci už v počátku endodontického ošetření!!!

- **Zábrus hrbolků!!!**      **Tvar endodontické  
kavity!!!**

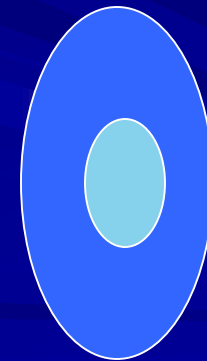


# Post



1/3

2/3



Schillinburg, Kessler, 1982



# Root canal inlay fabrication

- Direct method
- Indirect method