

# Restorative dentistry III. 3rd lecture – inlays, veneers

## Indirect reconstructions



# Rigid fillings – inlays, onlays

- The material is rigid (already cured)

Metal alloy, composite, ceramics.

# Inlays made of the metal alloy (precious alloys)

- Manufactured in a dental lab
- Direct or indirect method
  - Direct method rarely (class I. only)
  - Indirect method (most cases)

# 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

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



# Crown inlays

## Indications

- A big loss of dental tissues (cusps replacement)
- Next to the crowns and bridges made of metal alloy

# Inlays made of the metal alloy

## Indications

- Large defects (i.e. – cusps replacement)
- Large interdental spaces
- *Next to crowns and bridges made of metal alloys (risk of oral galvanism – electric current between two metals)*

# Inlays made of the metal alloy

## Contraindications

- High risk of dental caries
- Small and shallow cavities
- No in frontal area



# Inlay

## Advantages

- Better anatomic form
- Better polished

# Inlay

## Disadvantages

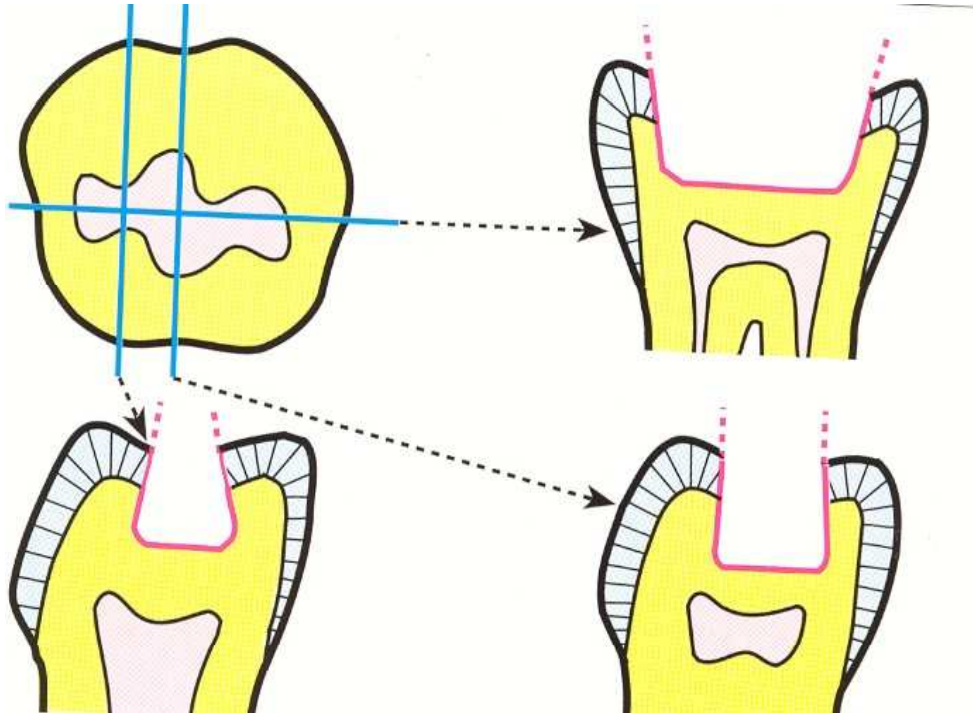
- The technology is not easy
- More time consuming
- Expensive

# Basic rules of preparation

➤ Box

➤ No undercuts

➤ Light divergence of the walls (facilitating shape). Angle of divergency 6 – 15°



## Box

No undercuts

Simple box

Facilitating shape

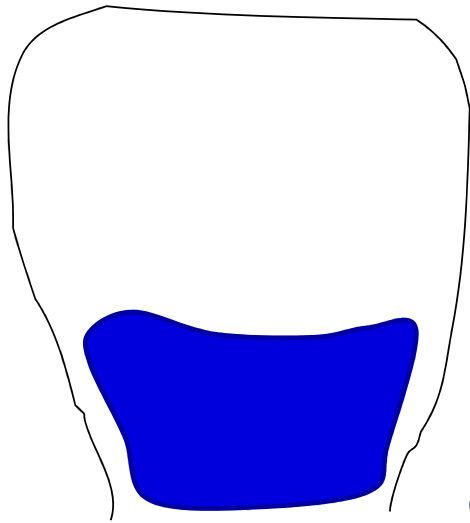


# Inlay of metal alloy

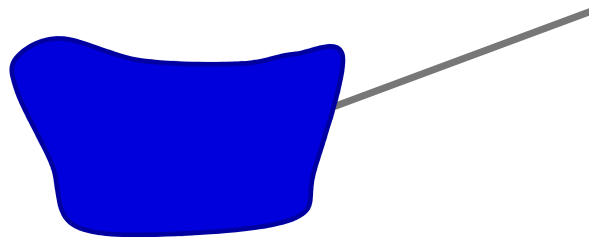
- Direct method (class I. or V.) - rarely
  
- Indirect method (in most cases)

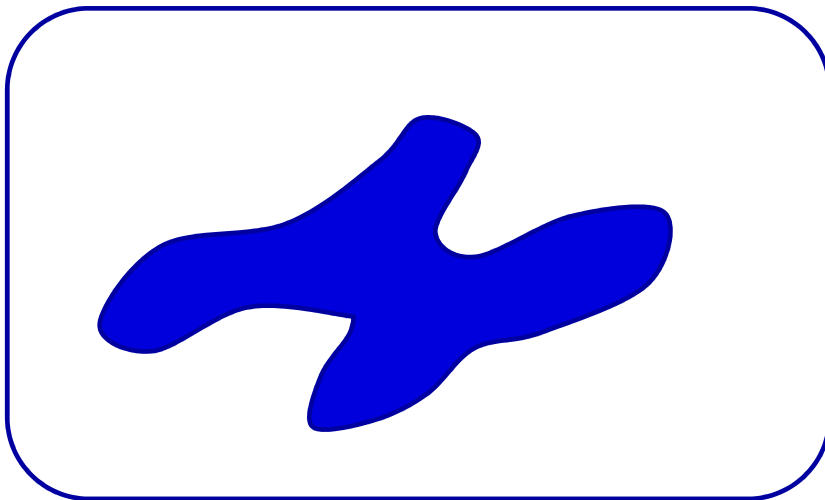
# Inlay of metal alloy

## ➤ Direct method



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





Class I.

All fissures are involved

No undercuts – facilitating form

Asymmetric outlines

Depth 1,5 mm

# Sequence of operations

Dental office

- Preparation
- Isolation of the cavity
- Modelling of heated casting wax
- Sprue pin – the thickest part, reservoir

Dental lab

- Investment
- Casting (method of lost wax)
- Finishing

Dental office

- Cementation



# Inlay of metal alloy

## Indirect method

Taking of the impression

Model

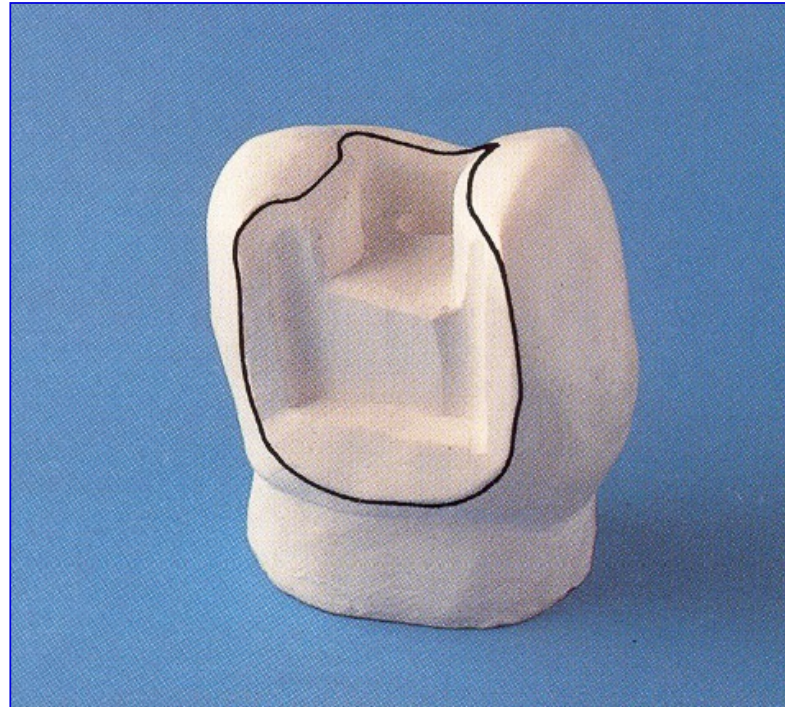
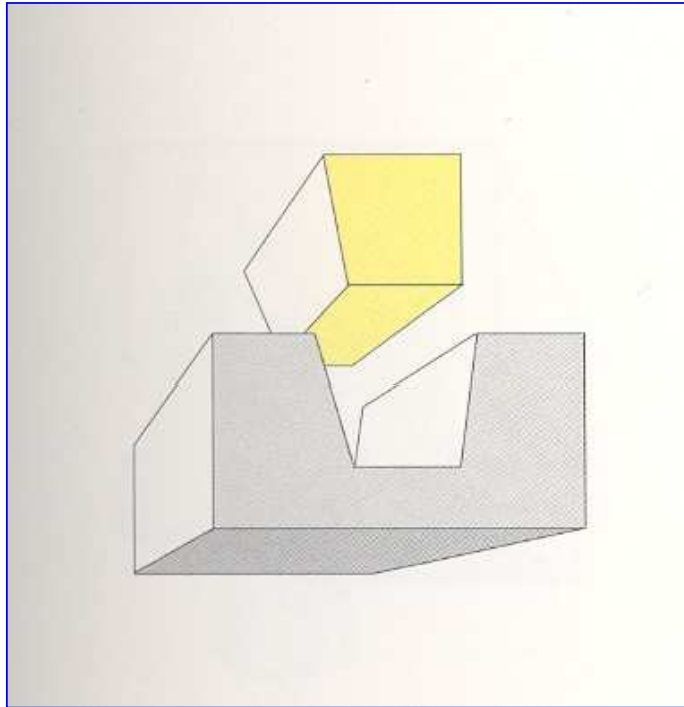
Modellation of the casting wax,  
(special polymers)

Sprue pin

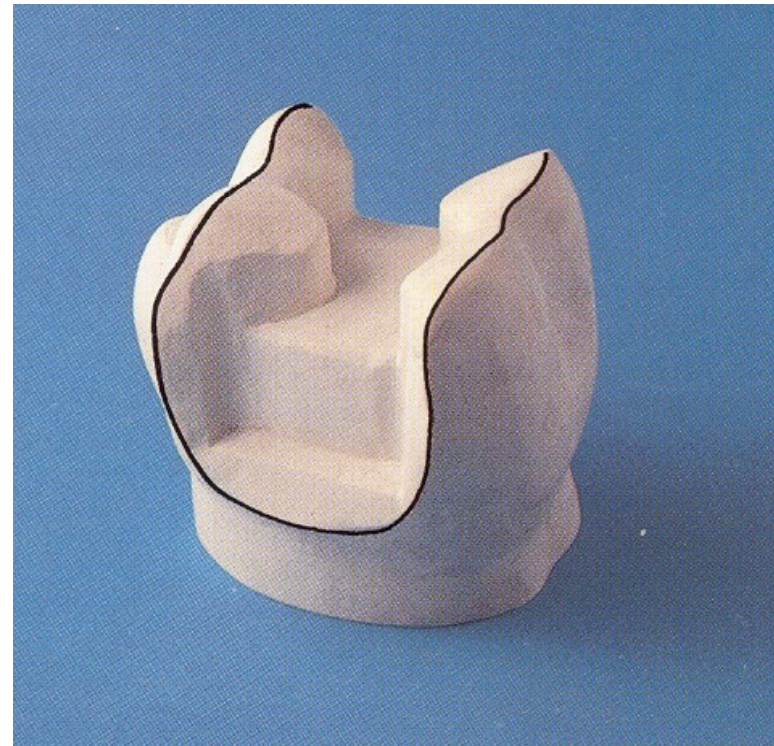
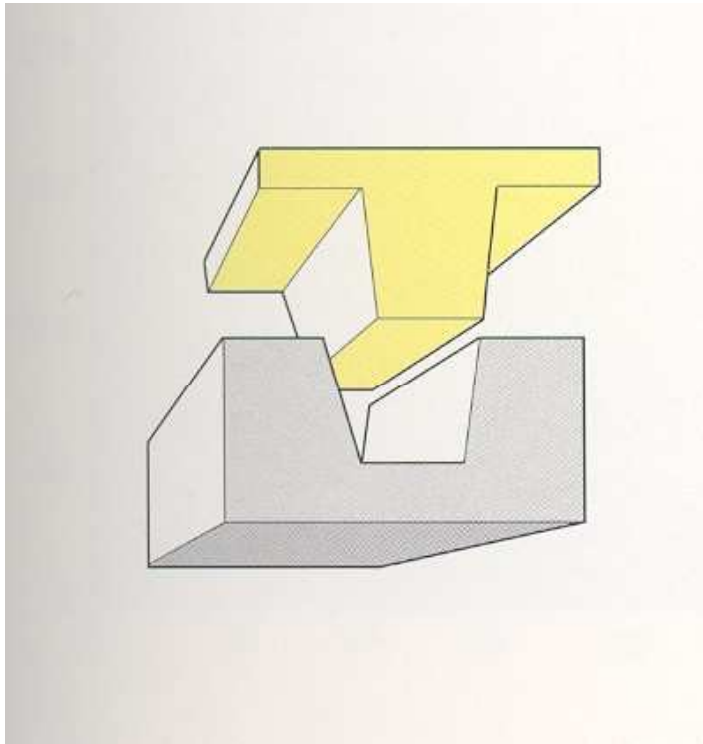
Investment

Lost wax method

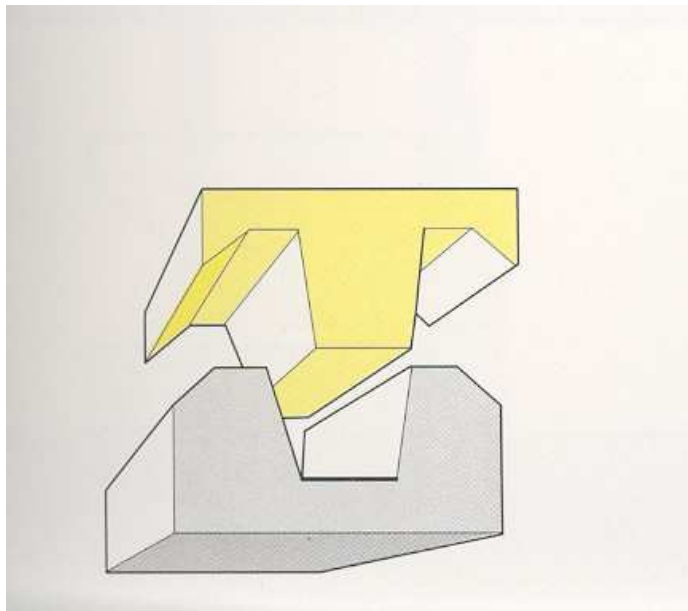
# Inlay



# Onlay



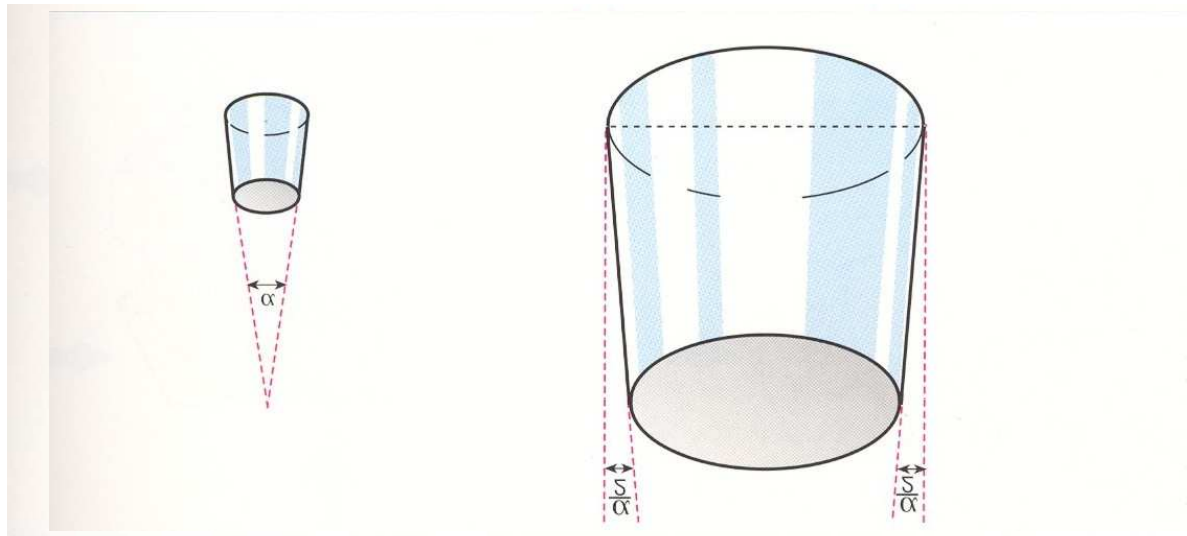
# Overlay

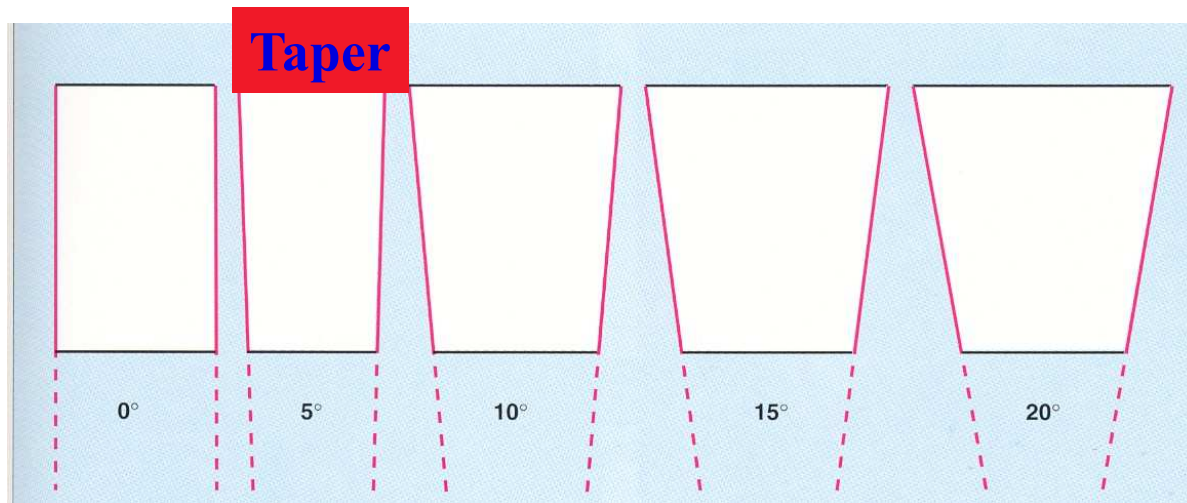
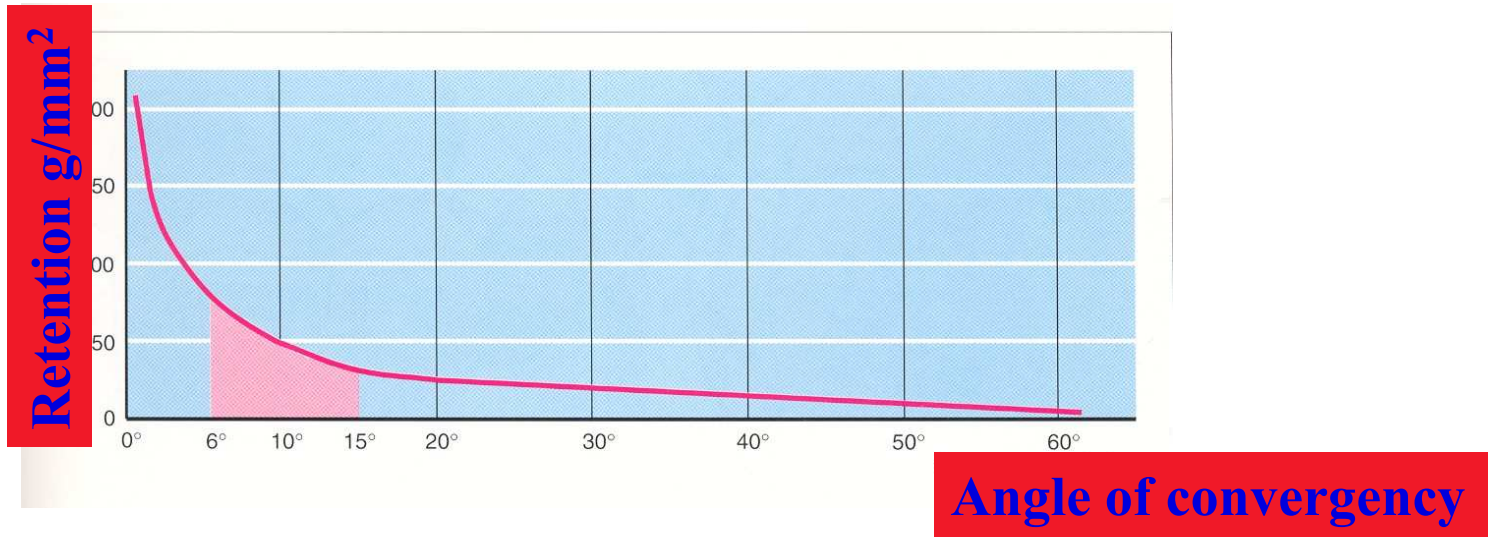


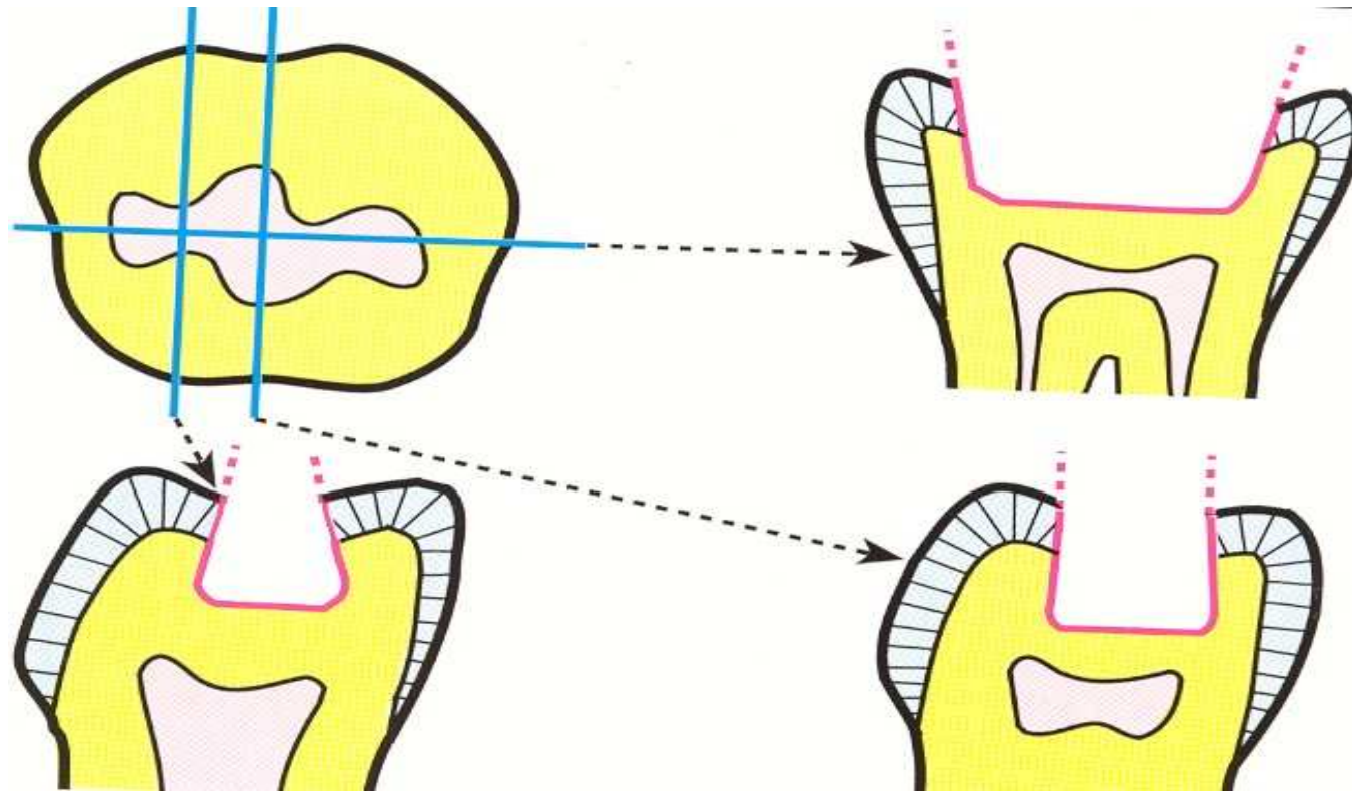
# Retention of rigid fillings

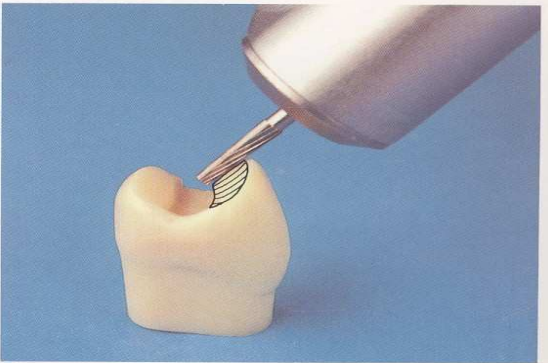
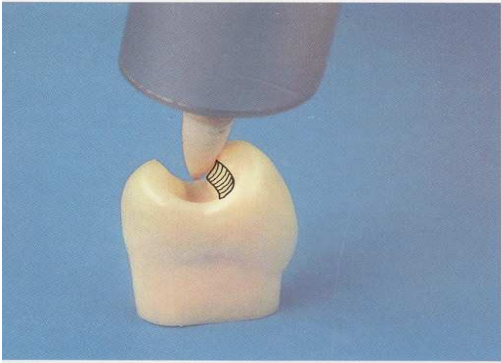
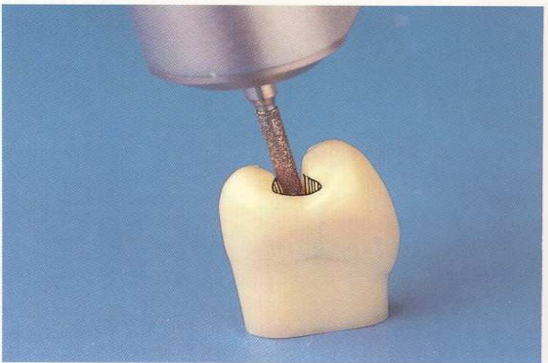
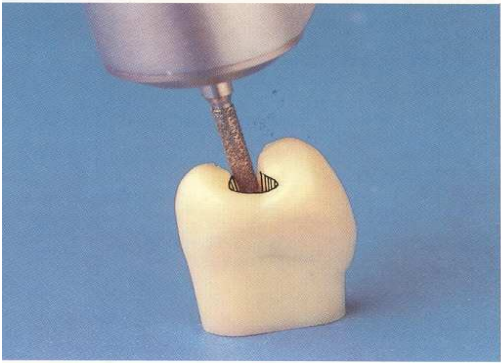
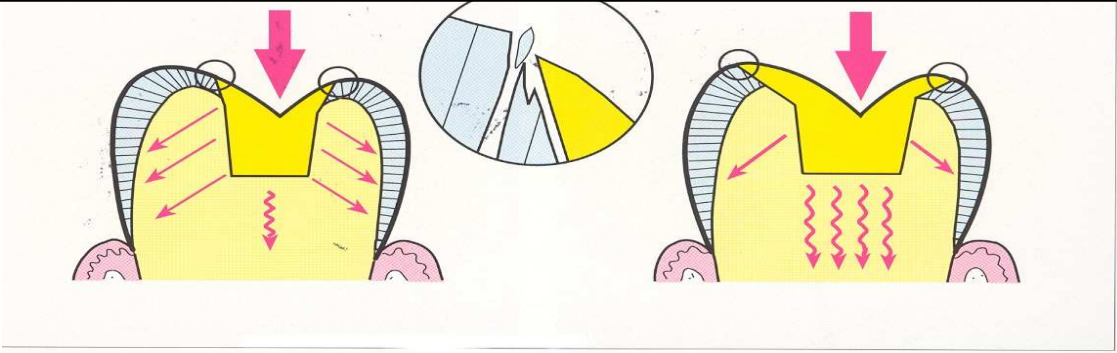
Against axial forces, depends on

1. Geometry of the preparation
2. Quality of the luting material (cement)

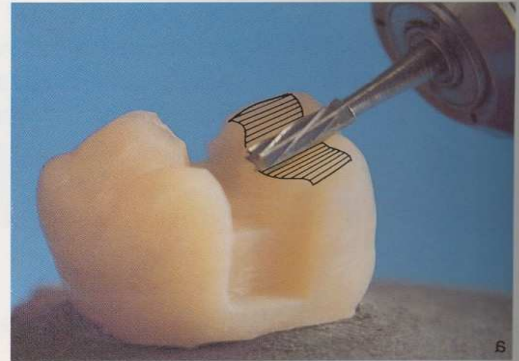
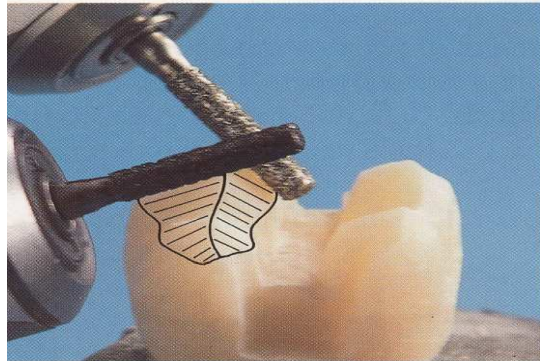
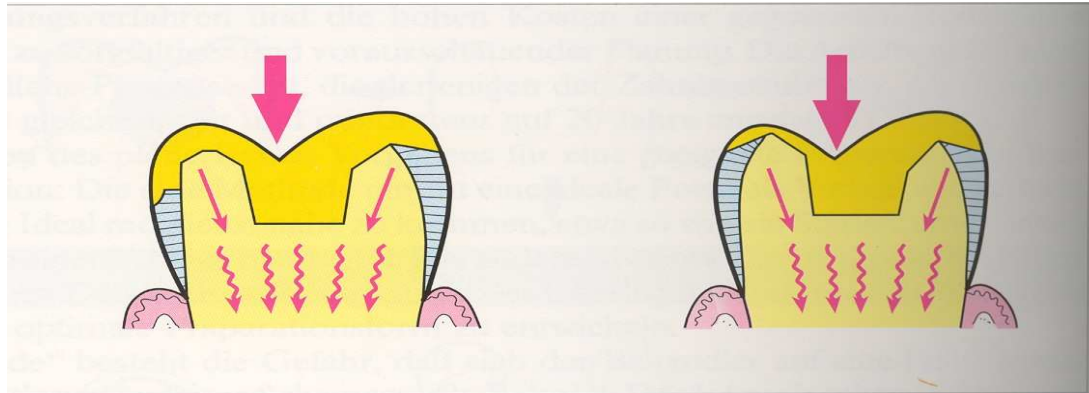




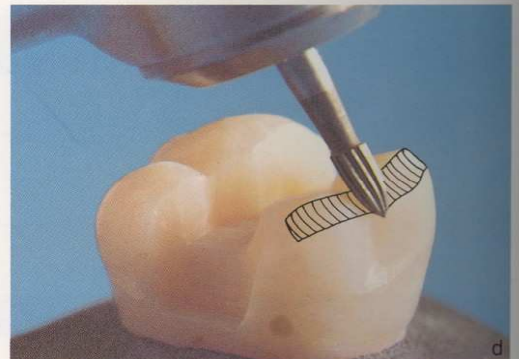
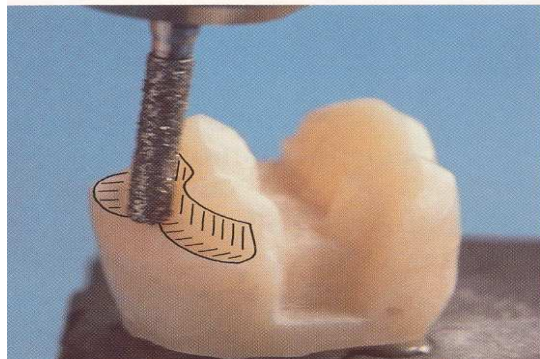


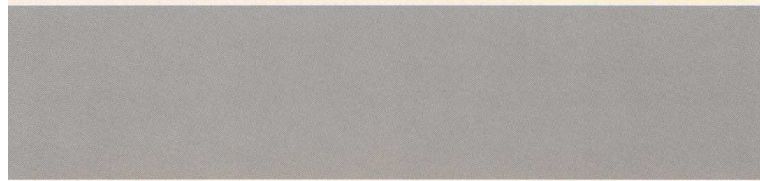


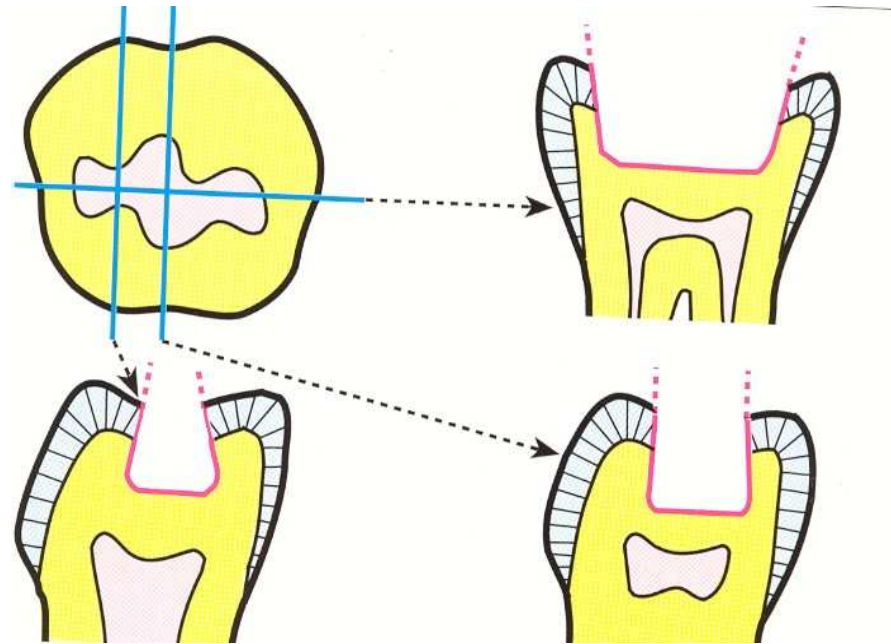
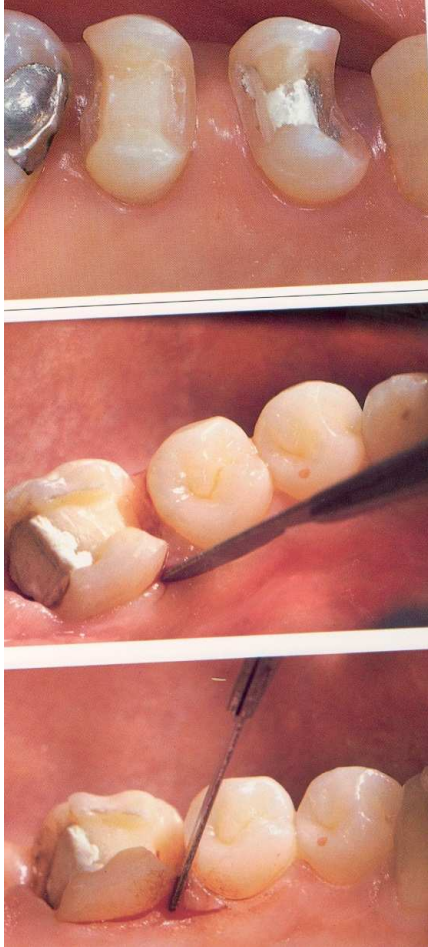


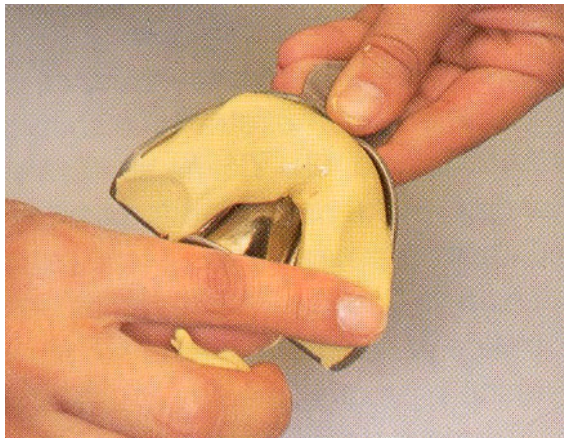


Erhalten Zahnstruktur  
Retain Zahnstruktur

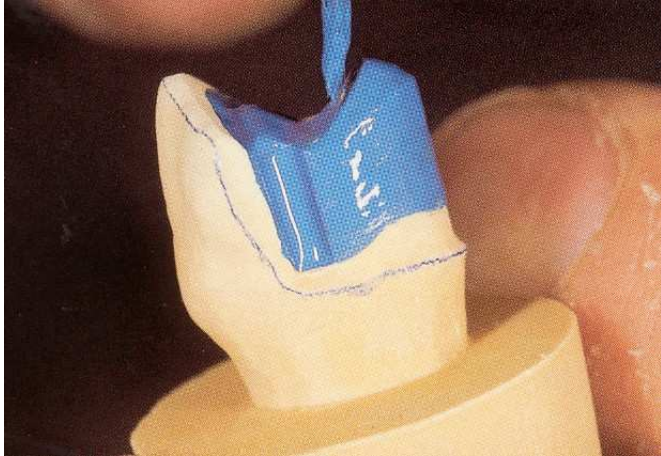
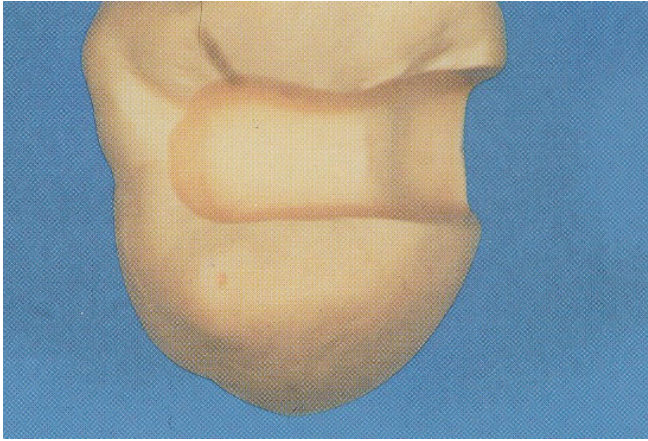




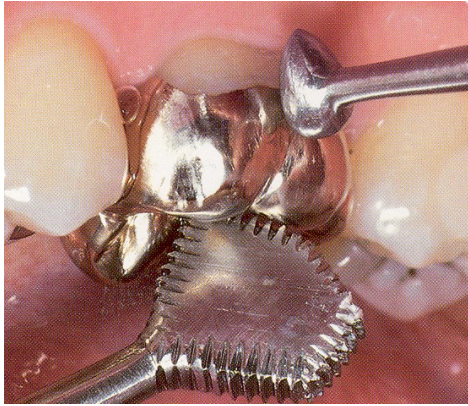
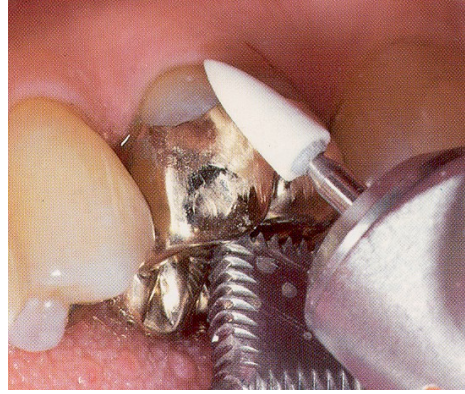




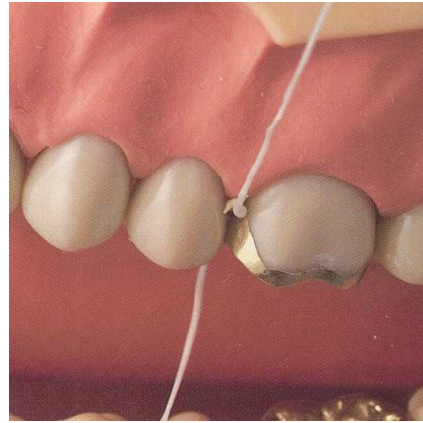
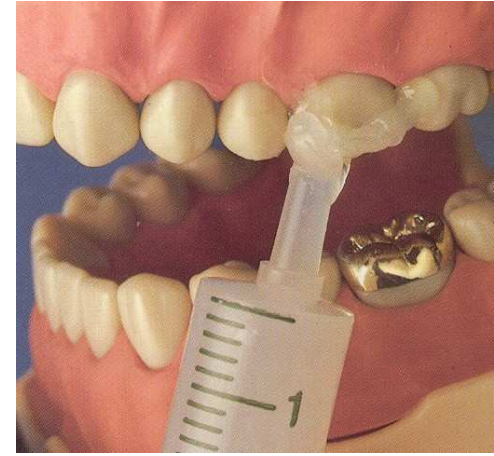
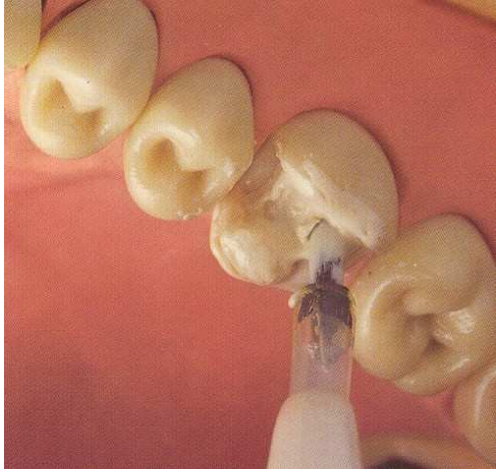












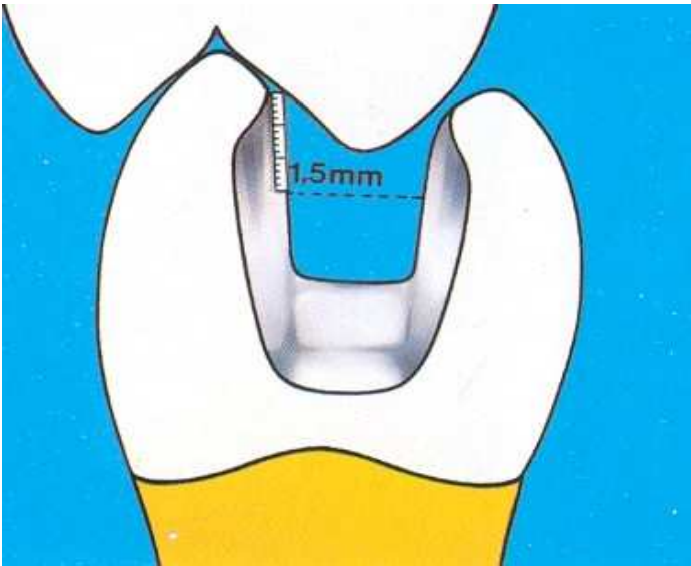
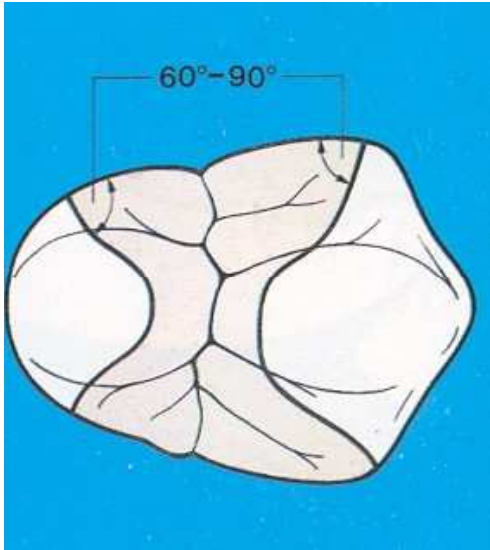
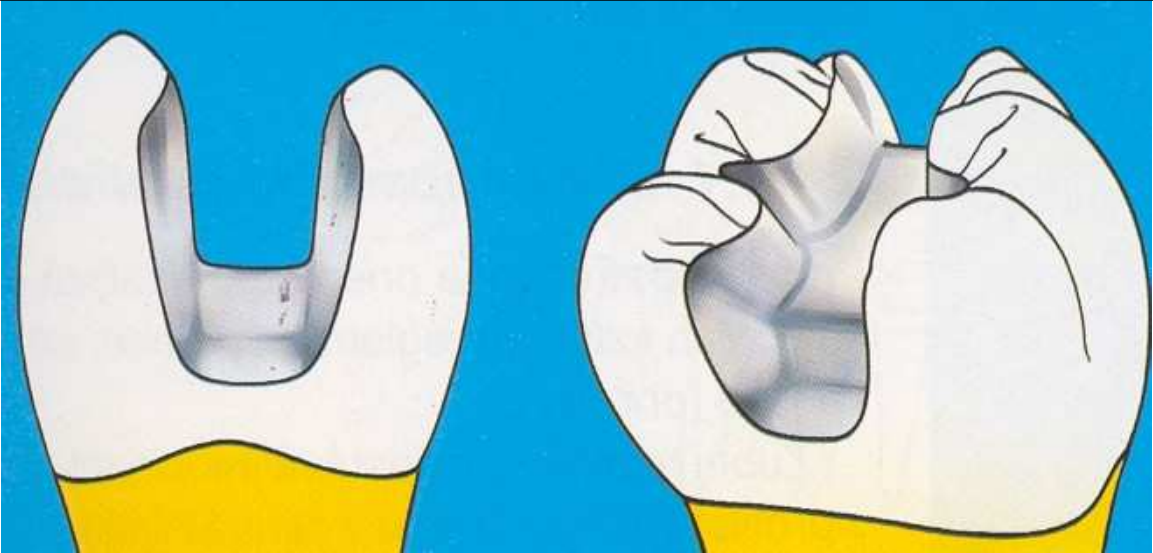
# Non metallic inlays

- Composite
- Ceramics

Indirect method

CAD CAM

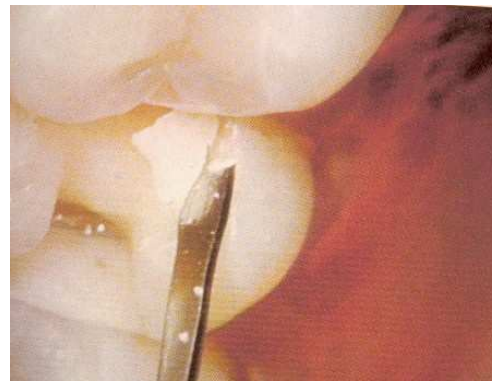
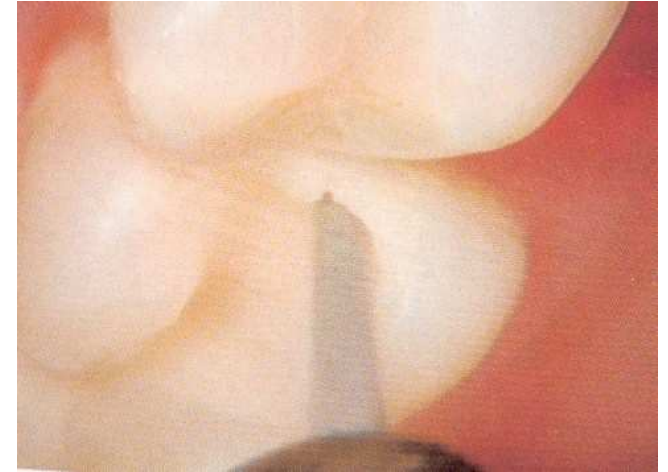




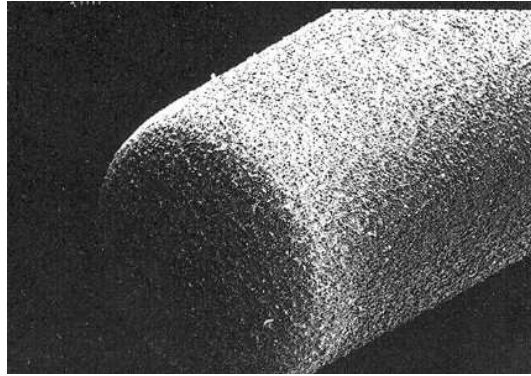
# Preparation

- Box
- No undercuts
- Facilitating shape – divergence of the walls appr.  $6^\circ$
- No bevel
- Thickness of the material 1,5 – 2 mm

Preparation  
Standard  
diamond bur  
Finishing with  
Fine diamond bur  
And hand instruments



Special diamonds  
for preparation



# Fabrication in dental lab – depends on the material

Cad Cam restorations can be made also chair side.







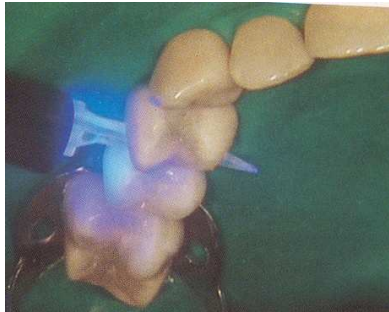
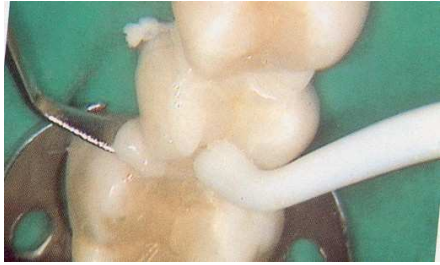
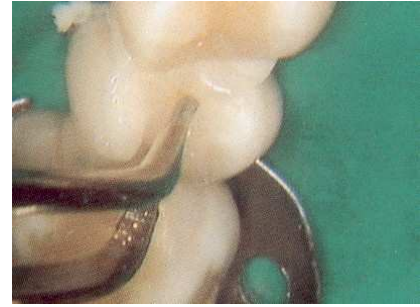
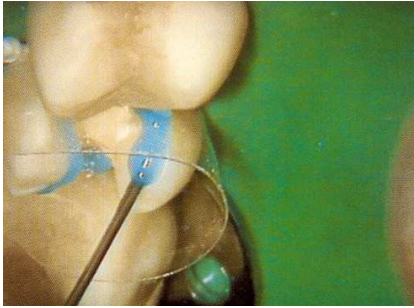


# Cementation

- Adhesive materials – composite cements
- Chemically or dual curing low viscosity materials

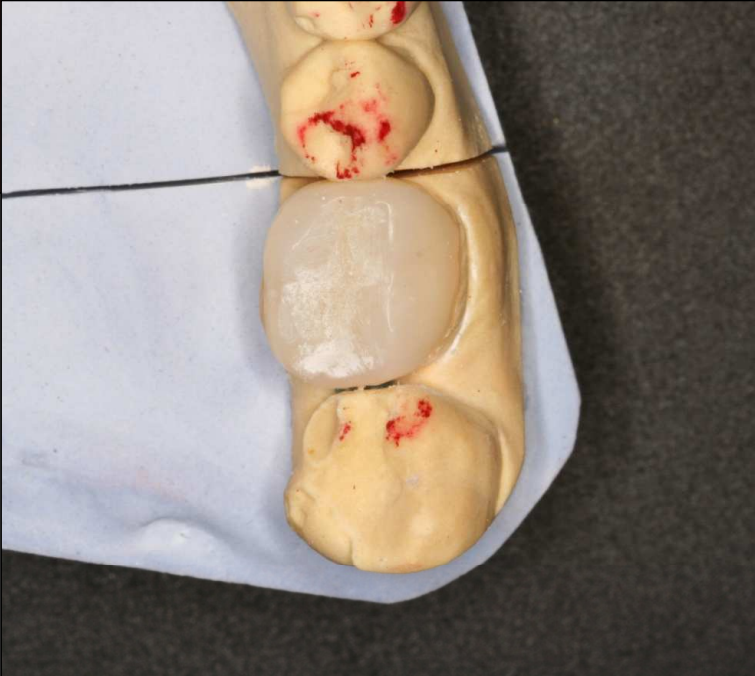


- Adhesive systems that must be compatible with adhesive cements



# The cement is covered with glycerin gel Inhibition layer is not present









# Selfcuring cements

Panavia 21 (Kuraray)

Dyract Cem (DENTSPLY De Trey)

# Light curing cements

- For thin veneers only



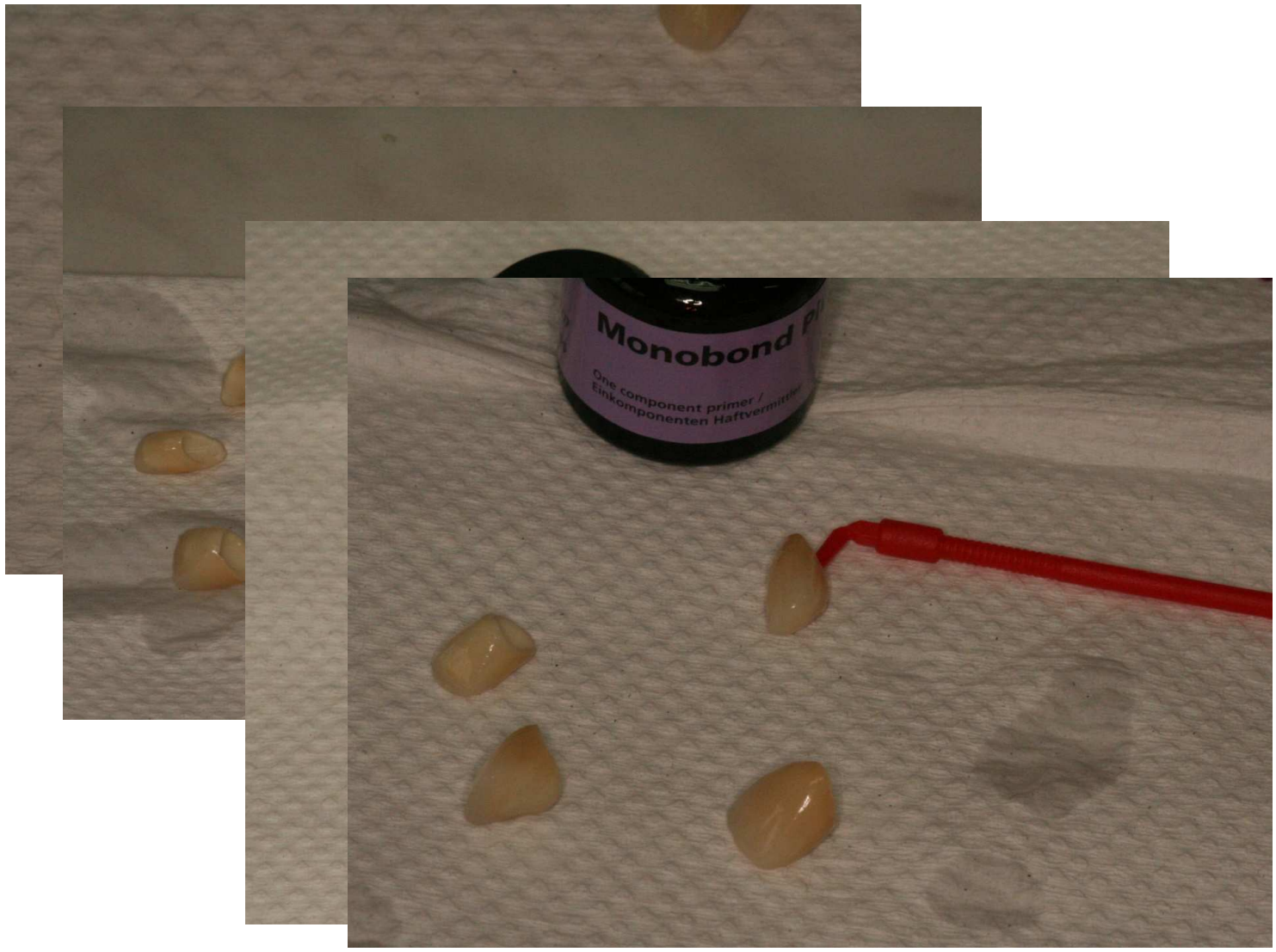
# Dual curing cements

- Two initiating systems















# Indirect restoration of anterior teeth

- Veneers
- Crowns
- Ceramics
- Composites (rare)

# Indications

- Hypoplasia
- Diastema, spaced frontal teeth
- Discoloration
- Multiple filling

# Contraindications

- High caries risk
- Bad oral hygiene
- Bruxism, deep bite

Consider full crown

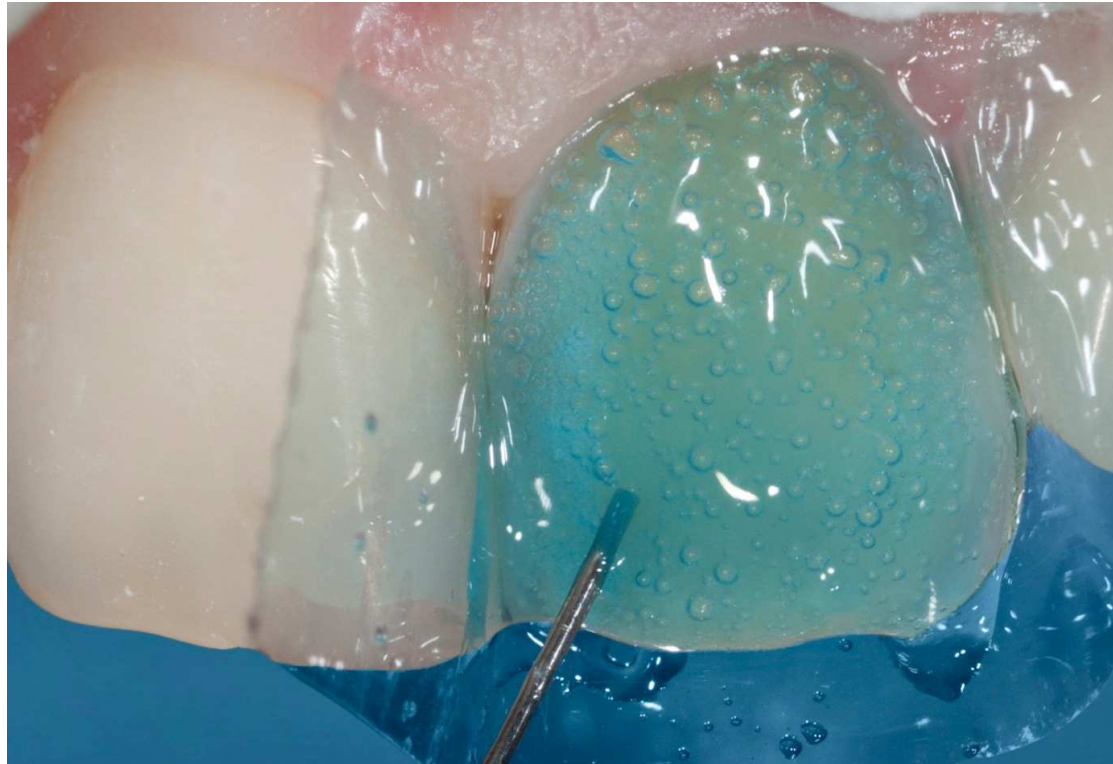
# Material

- Lithidudisilicate ceramics
- Made on model or CAD Cam

# Preparation – incisal edge involved



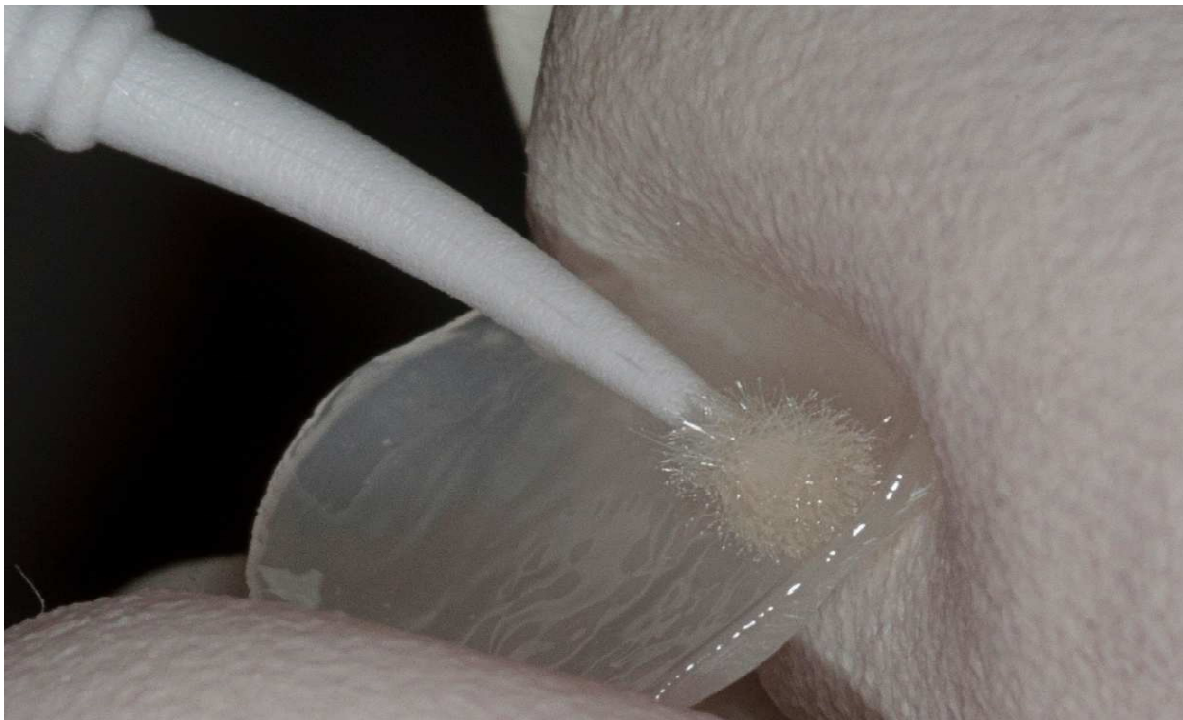
# Acid etching



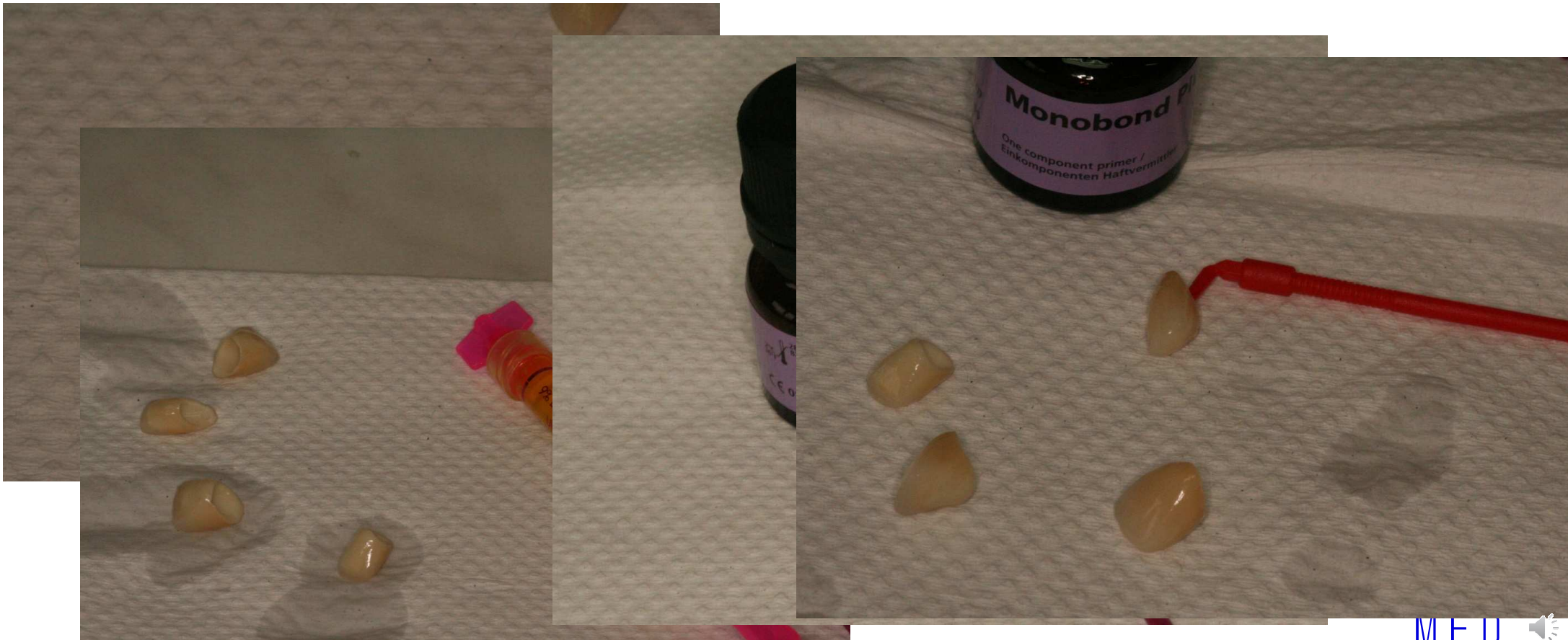
# Bonding







# Adhesive preparation of veneers and crowns



# Cementation



# Cementation





# Material

- Lithidudisilicate ceramics
- Made on model or CAD Cam