

Adhesive cementation

ADHESIVE DENTURES

Basic terms, adhesive cementation

- Fixed dentures that are fixed using adhesive cementation.
- Adhesive dentures: veneers, inlays, onlays, partial crowns, adhesive bridges, conventional crowns and bridges can be also cemented using adhesive cementation.

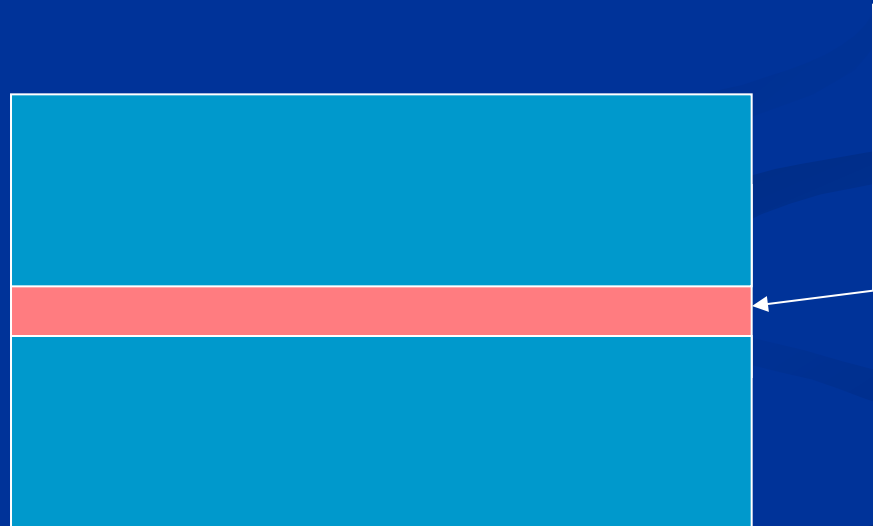
Material: Resin, ceramics, metal

Adhesion

Ability of two materials to be connected
(glue)

➤ Adhesive

➤ Adherend



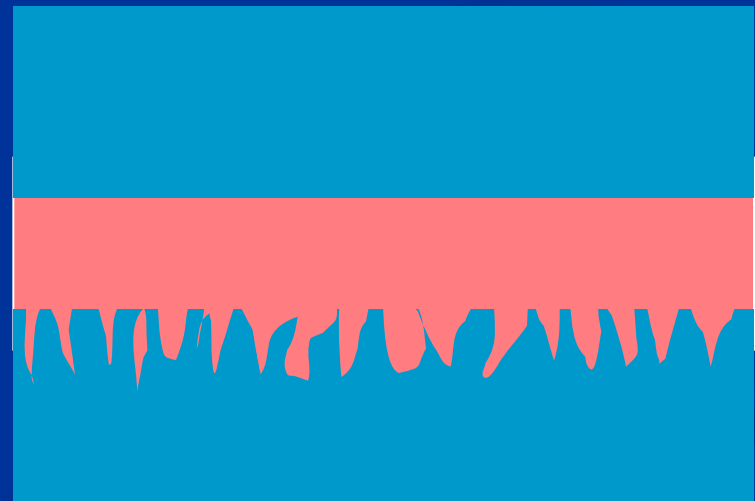
Adhesion

- Mechanic
- Specific

Adhesion

- **Mechanic**

Is based on the roughness of the surface



Adhesion

➤ Specific

Physical

Chemical

Adhesion

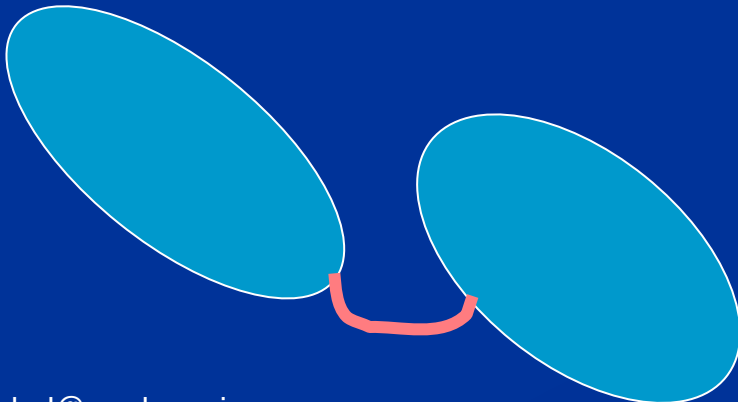
➤ Specific

Fysical – intermolecular forces

Van der Waals

H- bridges

Elektrostatic



Adhesion

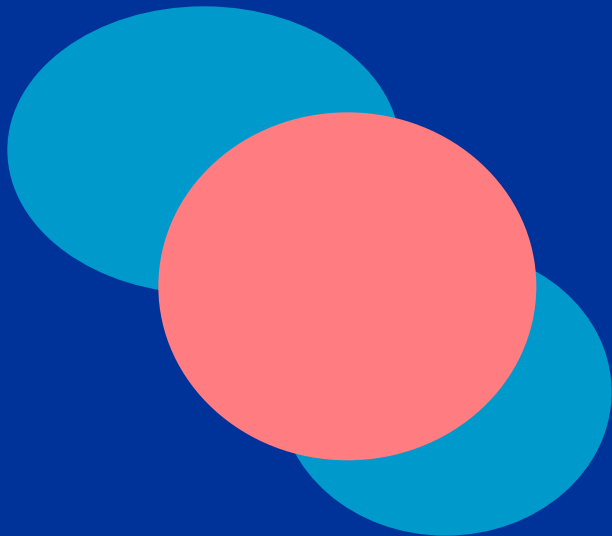
➤ Specific

Chemical binding

covalent

ion

metal

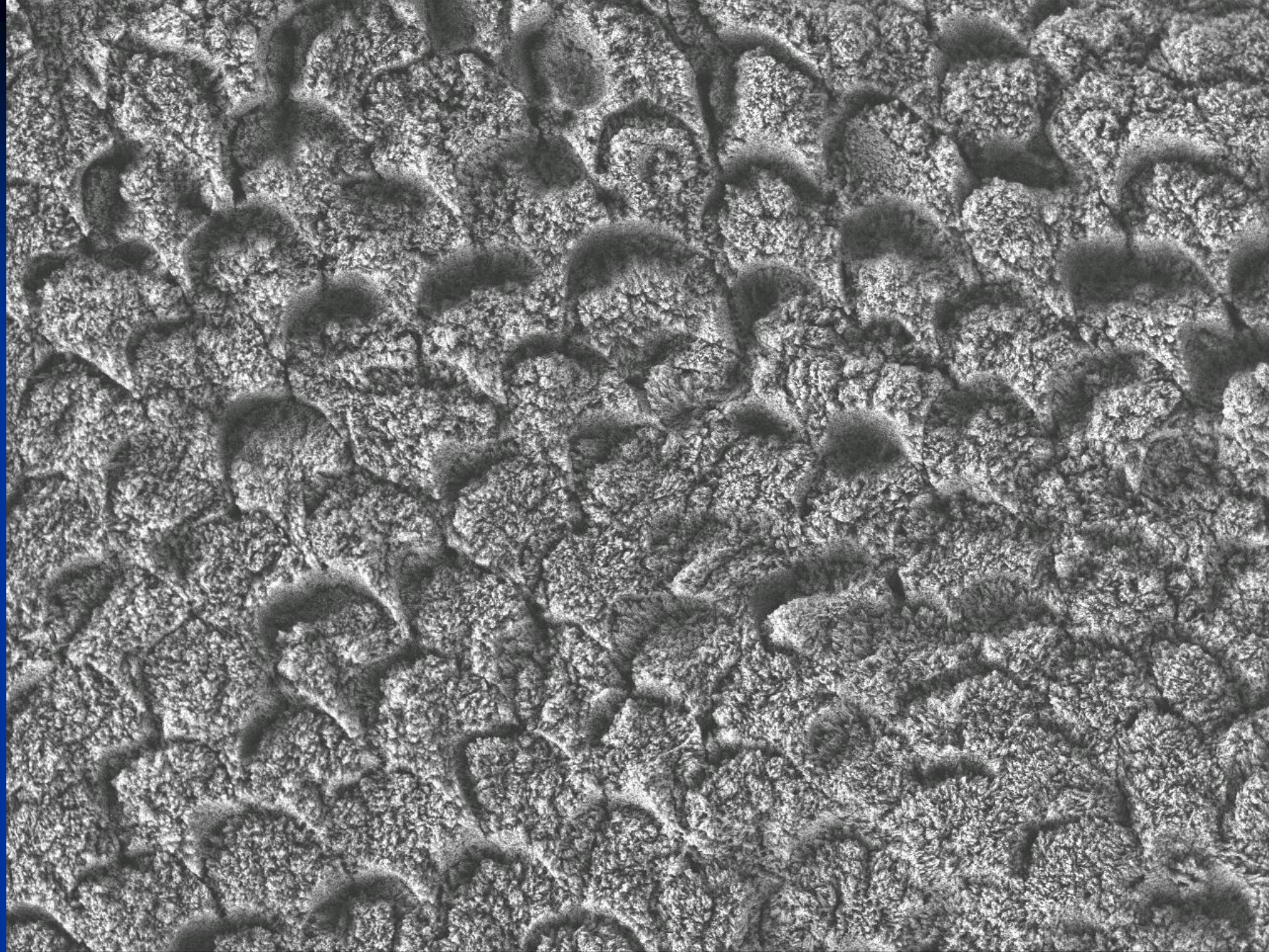


Adhesive treatment in dentistry

- Sandblasting
- Acid etching
- Elektrolytic treatment
- Laser
- Plasma coating
- Silanization

Adhesive treatment of surfaces in dentistry

- Creates irregularities of the surface (roughness)
- Increases surface energy
- Increases wettability
- Combination



ISI

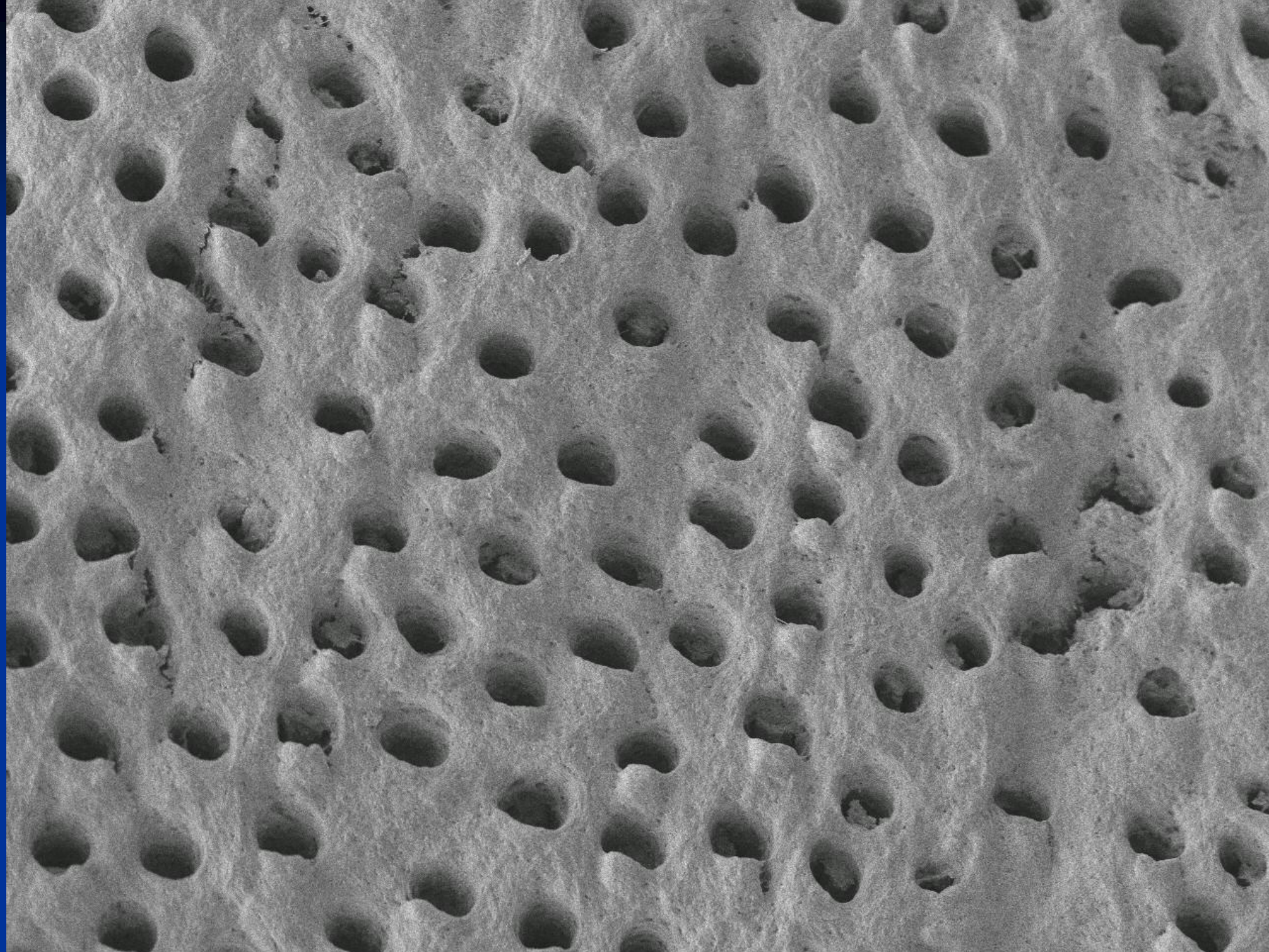
LEI

5.0kV

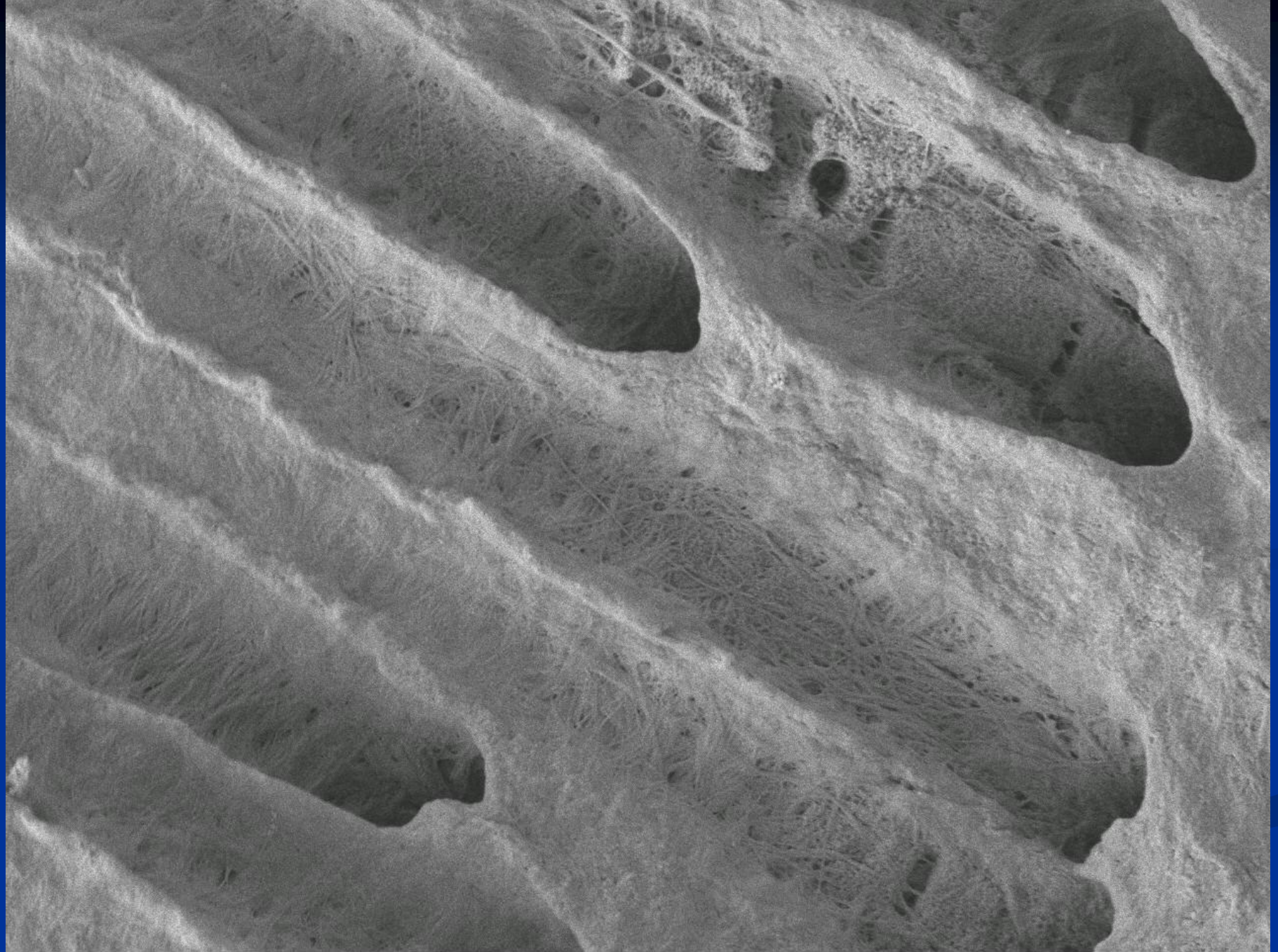
X2,000

10μm

WD 7.5mm



ISI LEI 5.0kV X2,000 10 μ m WD 8.6mm



ISI

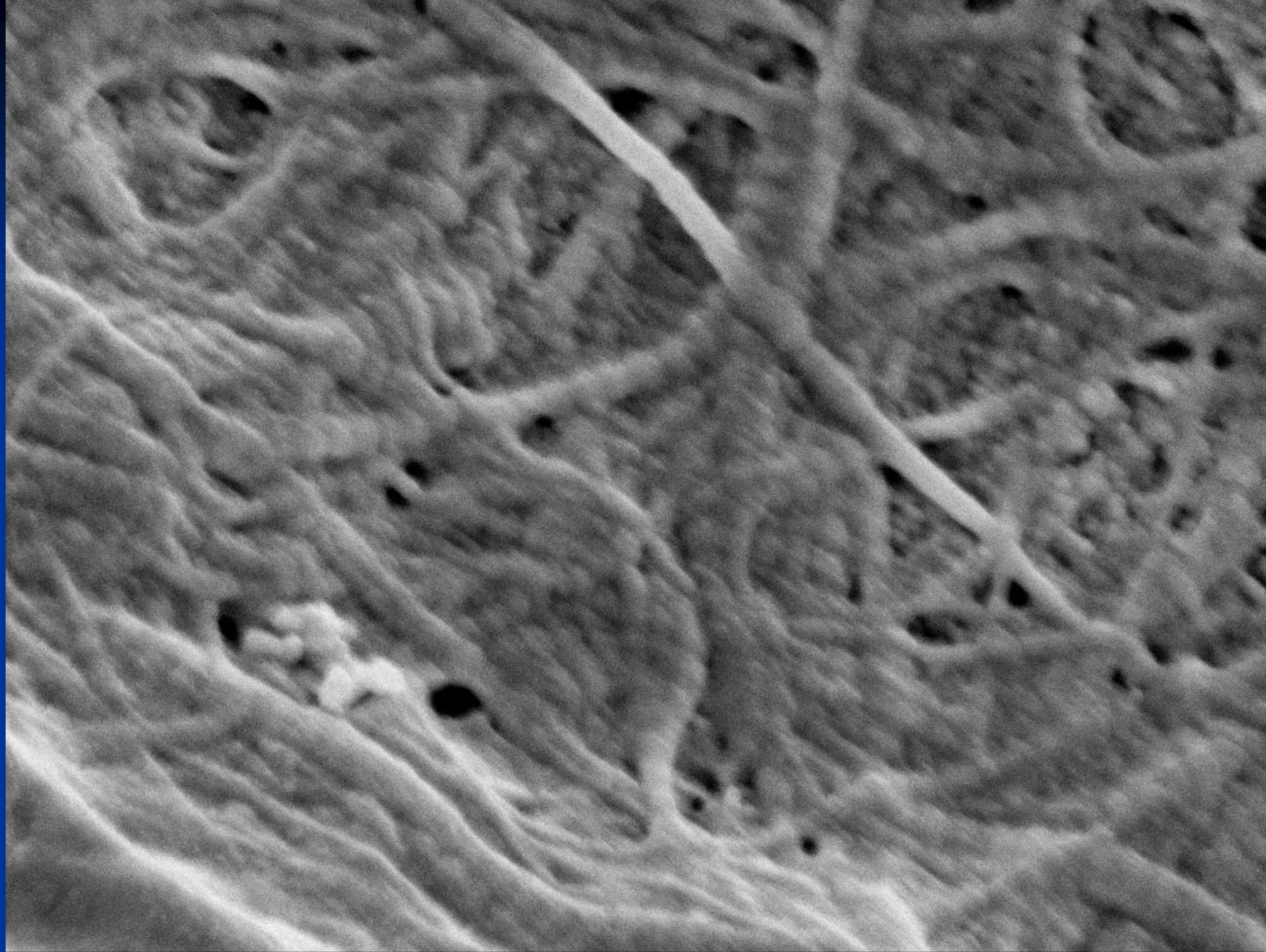
LEI

5.0kV

X5,000

1 μ m

WD 8.6mm



ISI

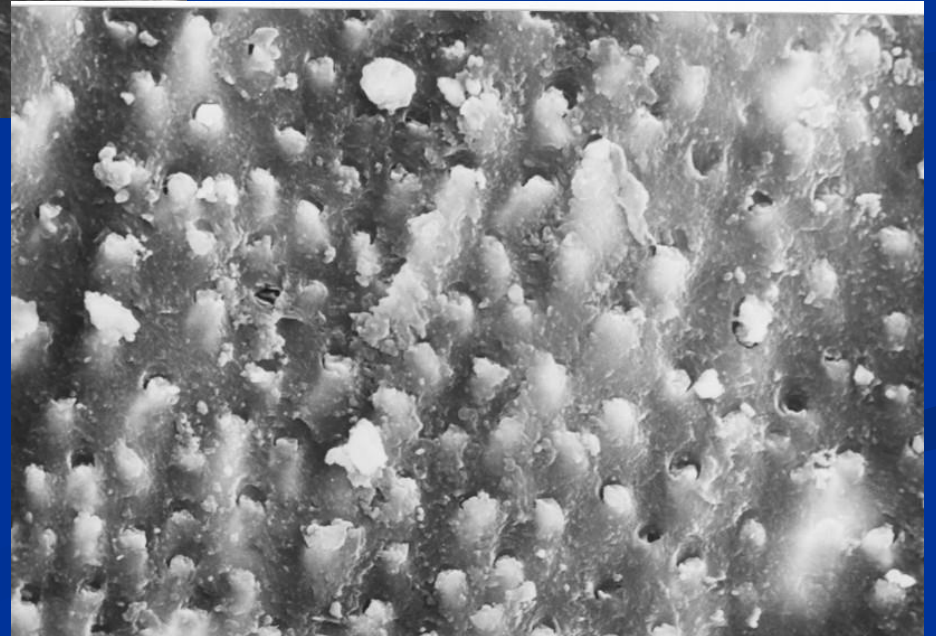
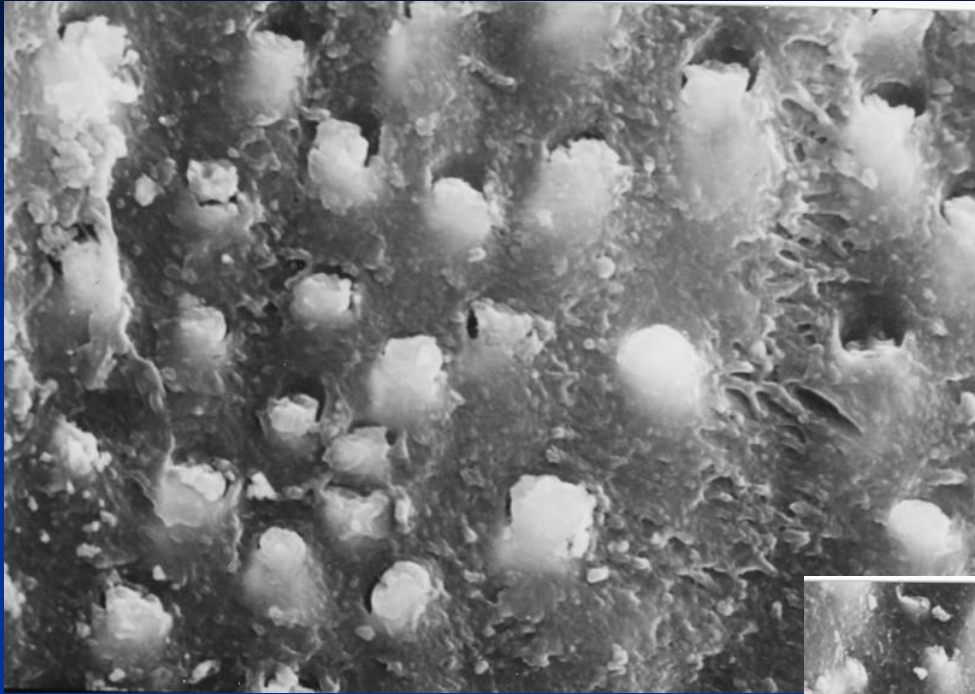
SEI

5.0kV

X55,000

100nm

WD 8.6mm



Adhesion - importance

- Making fillings
- Cementation
- Other (making dentures)

Composite cements

- Composite materials
- Lower viscosity
- Selfcuring, dual curing. In special cases also light curing only.

Bonding to hard dental tissues (enamel and dentin)

■ Miromechanically

- Acid etching
- Selfetching adhesive systems
- Selfetching (selfadhesive cements)





Refill 50

Recorder # 533670

ivoclar
vivadent
clinical

ivoclar
vivadent

Variolink II Catalyst
ivoclar

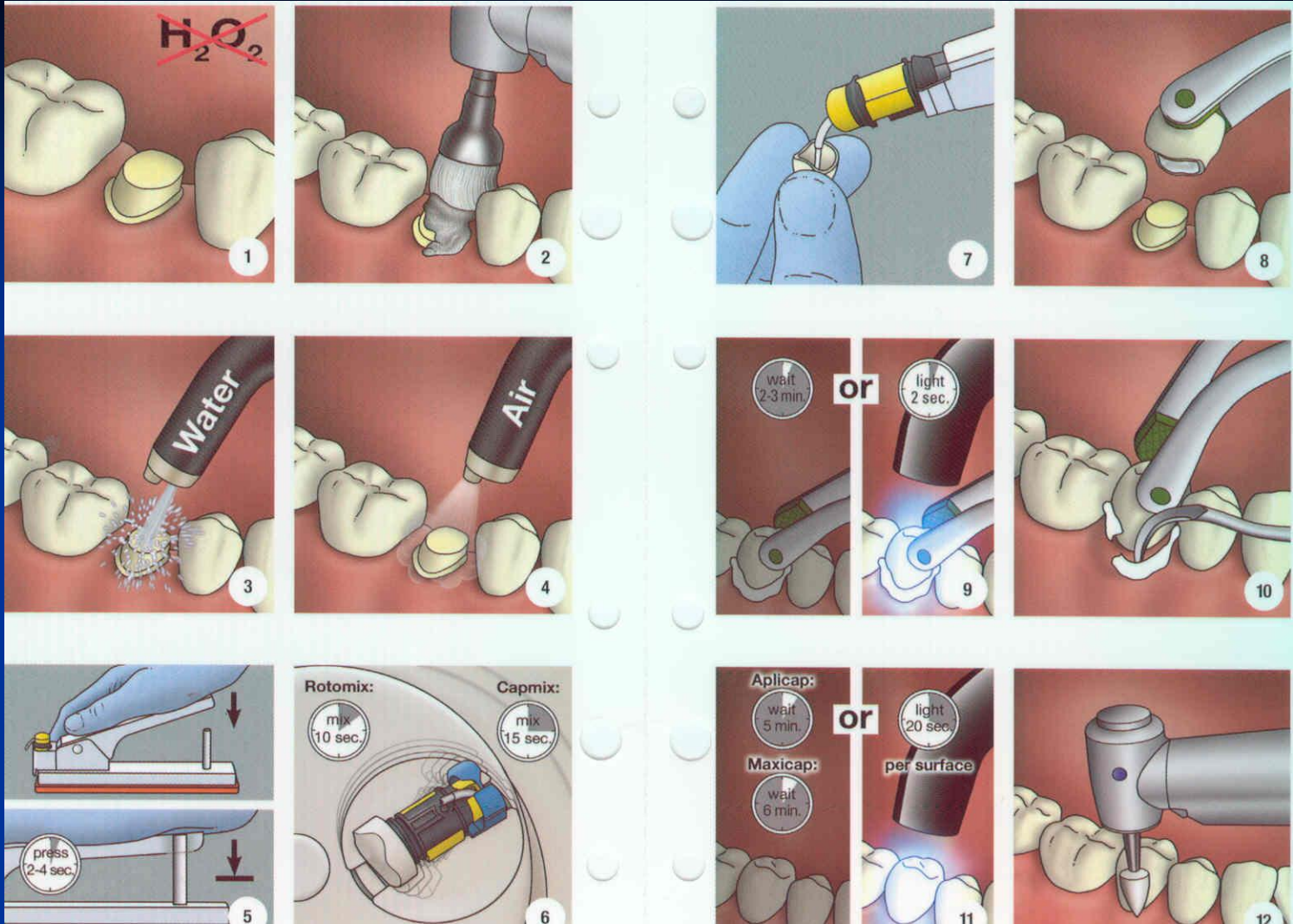
Variolink II Base
2.5 g
2006-06

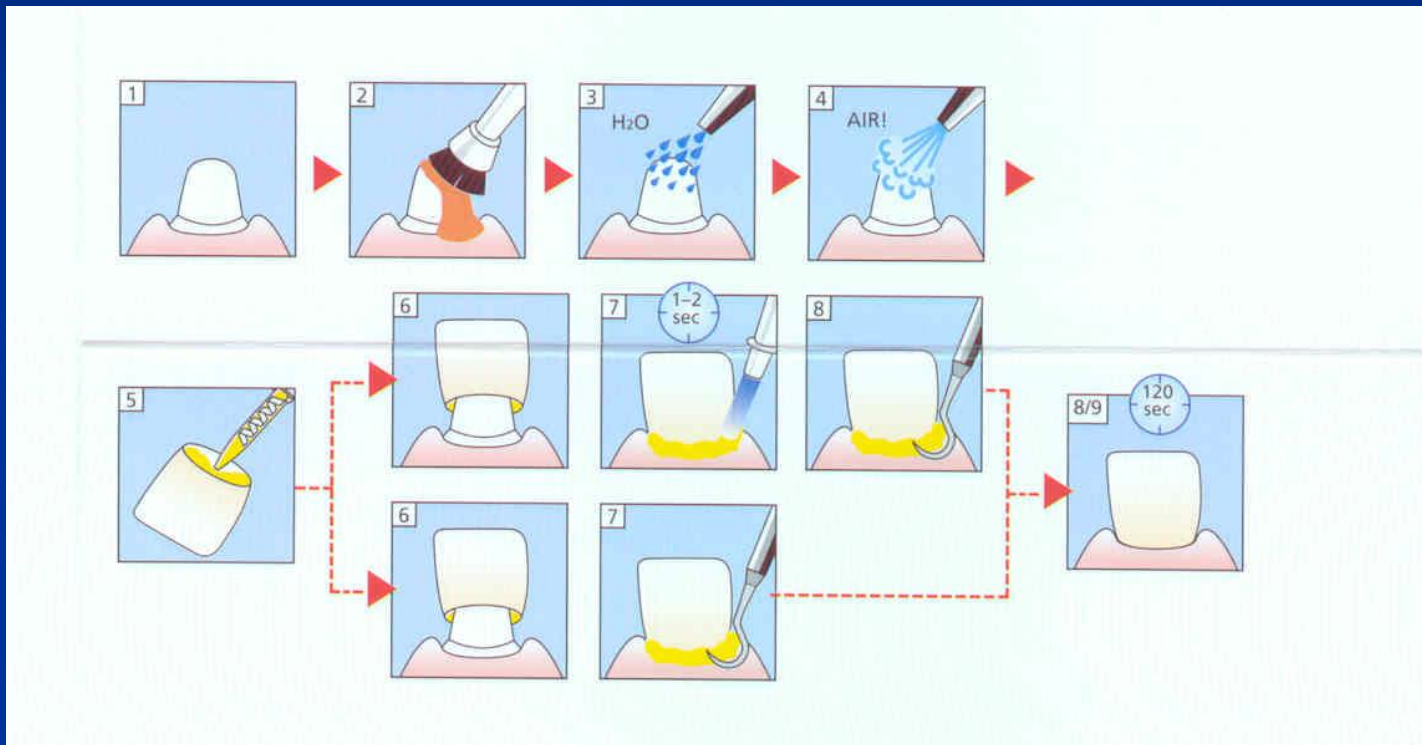
Facite BSC



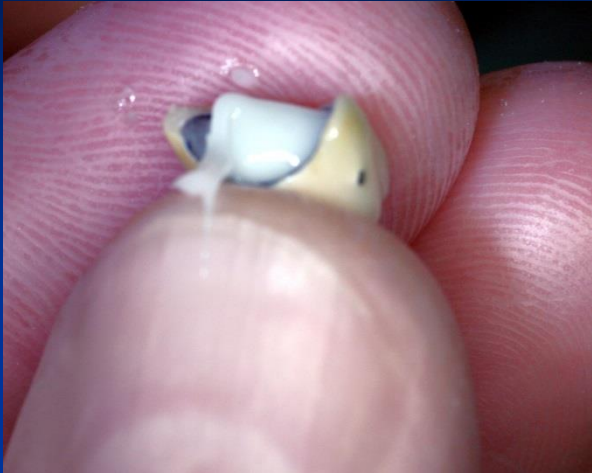










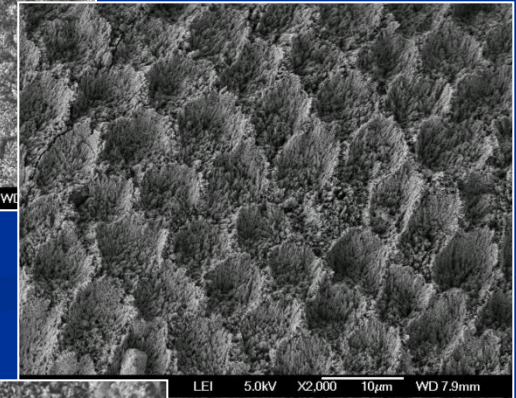
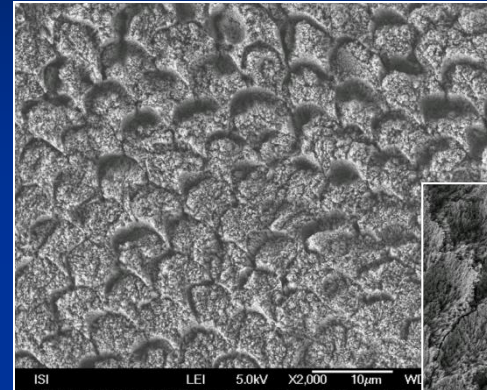


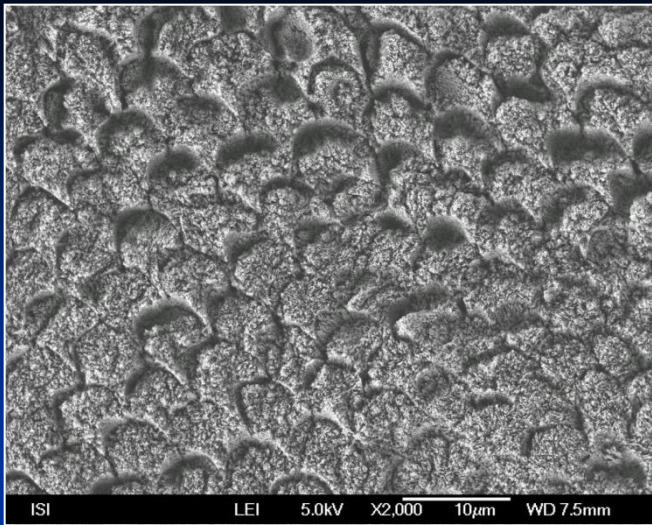
Preparation of surfaces before adhesive cementation

- Enamel
- Dentin
- Ceramic materials
- Composite materials
- Metal alloys

Retentive pattern

- Periprismatic
(Interprismatic)
- Intraprismatic
- Aprismatic

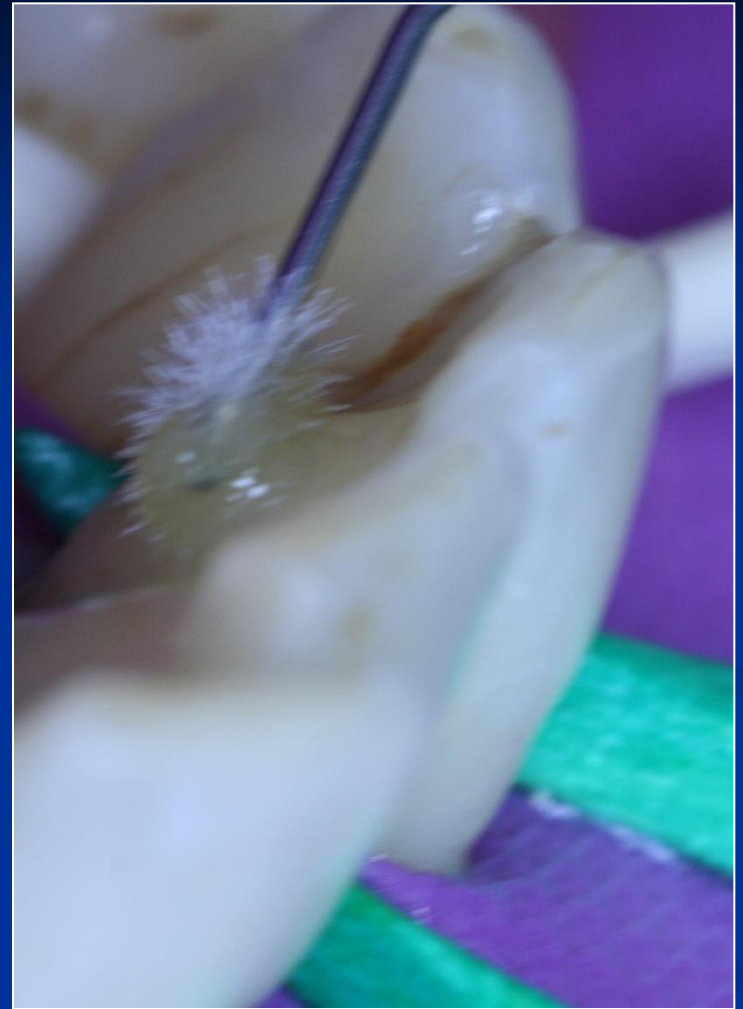




TE

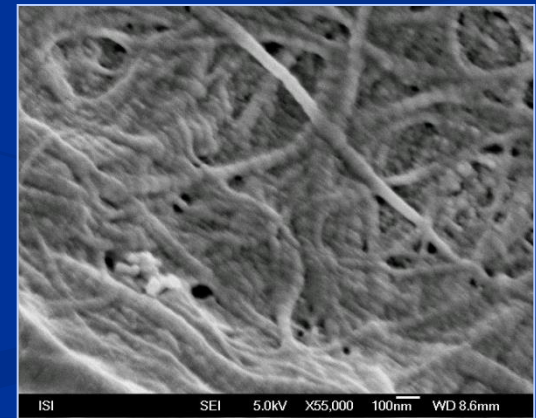
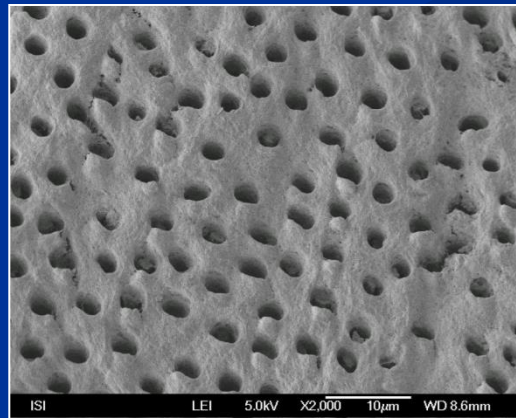
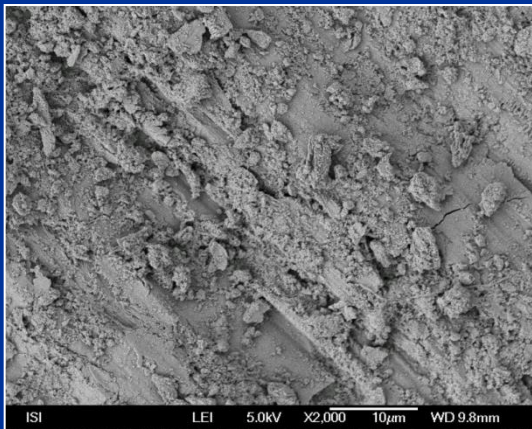


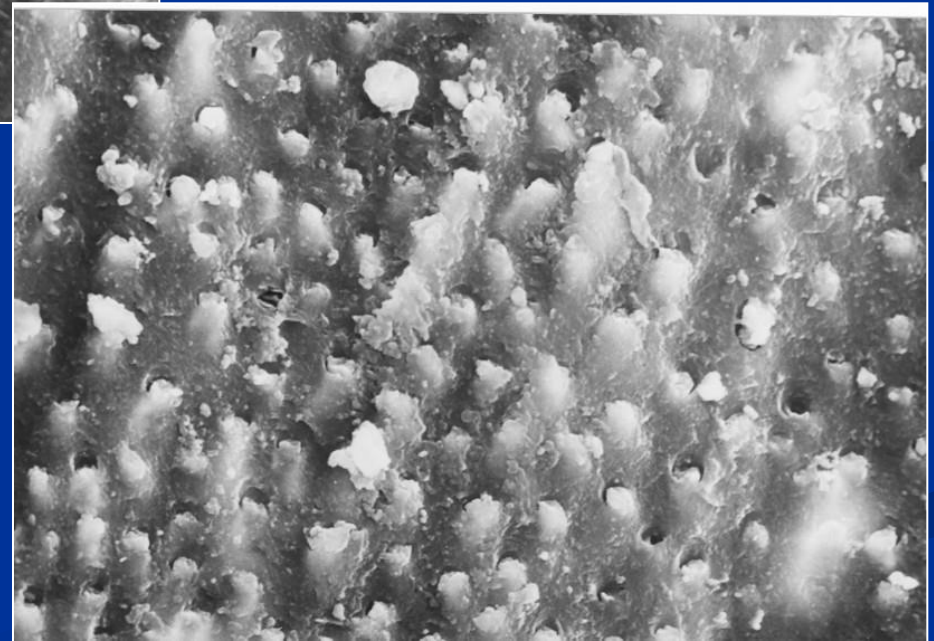
SE

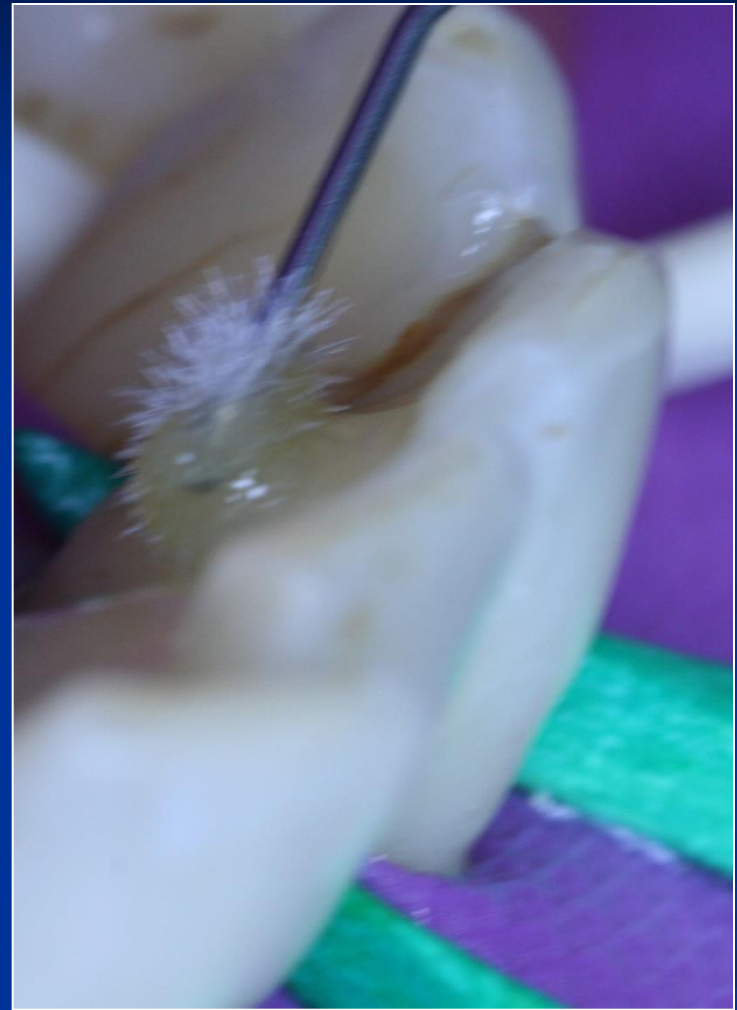
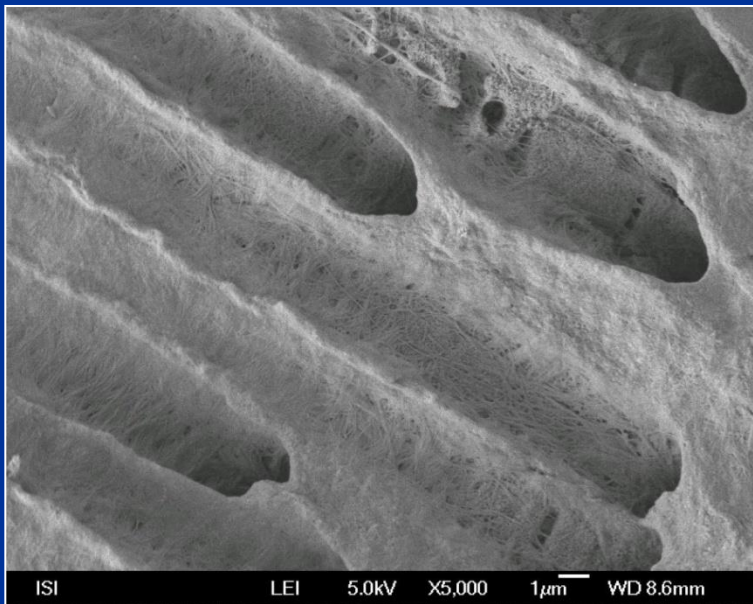
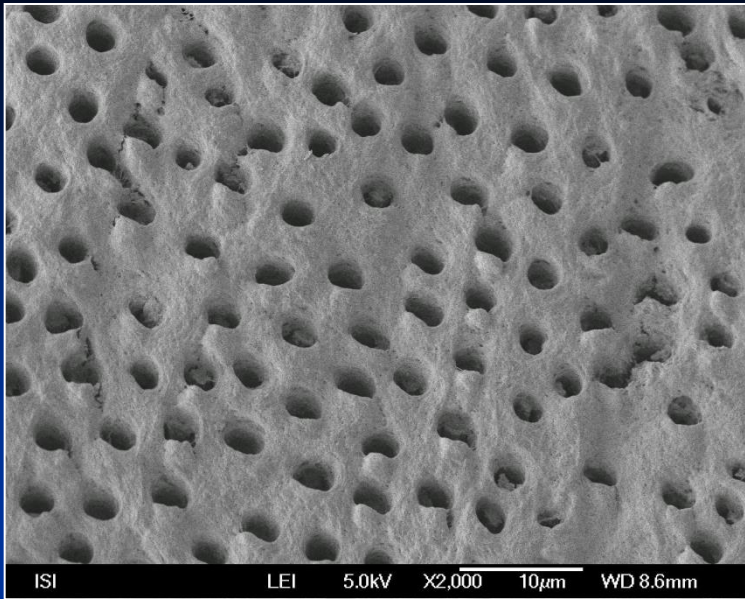


Retentive surface of dentin

- Smear layer is removed (modified)
- Open dentin tubules
- Decalcified collagen network







Ceramic materials

Silicate ceramics - etchable

- Feldspatic
- Leucit
- Alumina
- Lithiumdisilicate

Non silicate ceramics - non etchable

- Vysoce denzní alumina
- Zirkonosxde
- Highly dense zirkonia (yttrium stabilized)
- Pressed or layered
CAD/CAM ceramics

Less than 15% silicate matrix is not silicate ceramics

Ceramic materials

Silicate ceramics

- Crystals in glass matrix



- Etching HF

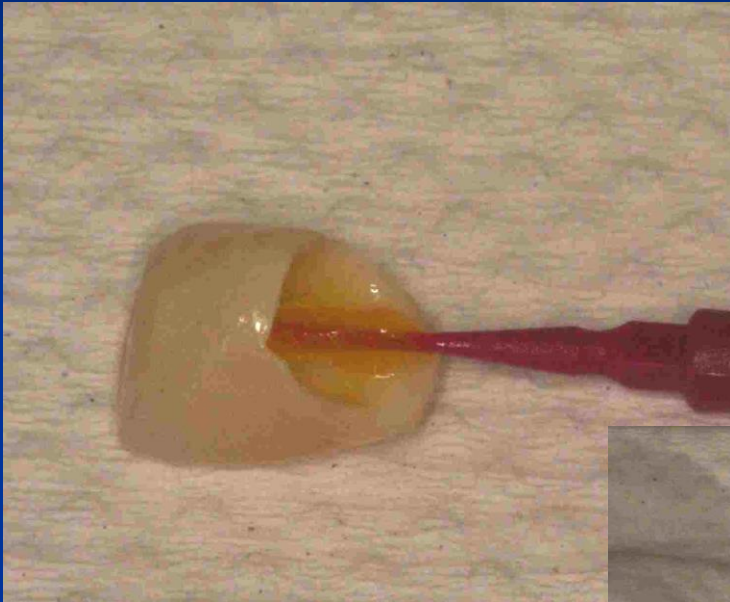
Oxide ceramics

- Highly dense material



- Sandblasting Al_2O_3

Etching



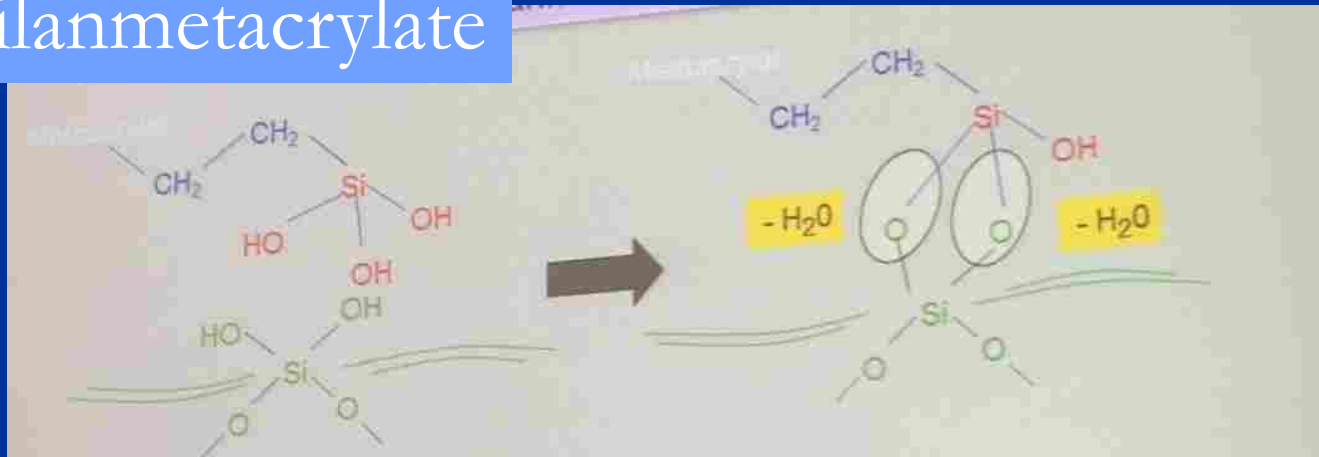
Composite and metal surfaces

- Sandblasting



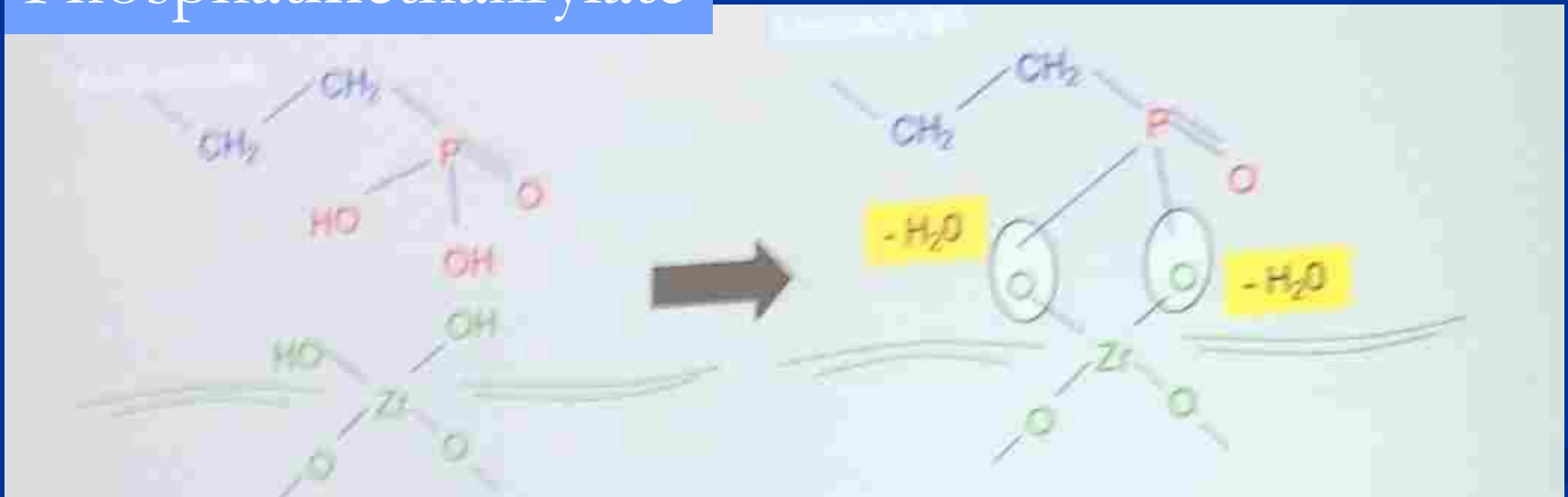
Chemical adhesive treatment: ceramics, composite, metal

Silanmetacrylate



Chemical adhesive treatment of zirconoxide ceramics and non precious alloys

Phosphatmethakrylate



Chemical adhesive treatment of golden alloys

Sulfidmethacrylate



$Au\text{---}Au\text{---}Au\text{---}Au\text{---}Au$

Comprehension

Sandblasting plus silane

- Metal
- Metalceramic (metal)
- Zirconia
- Composite

Etching plus silan

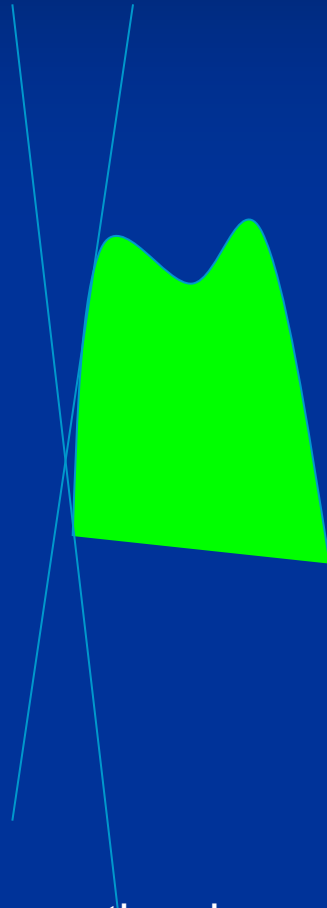
- Silicate ceramics

When adhesive cementation

- Area of retention - size
- Geometry of preparation

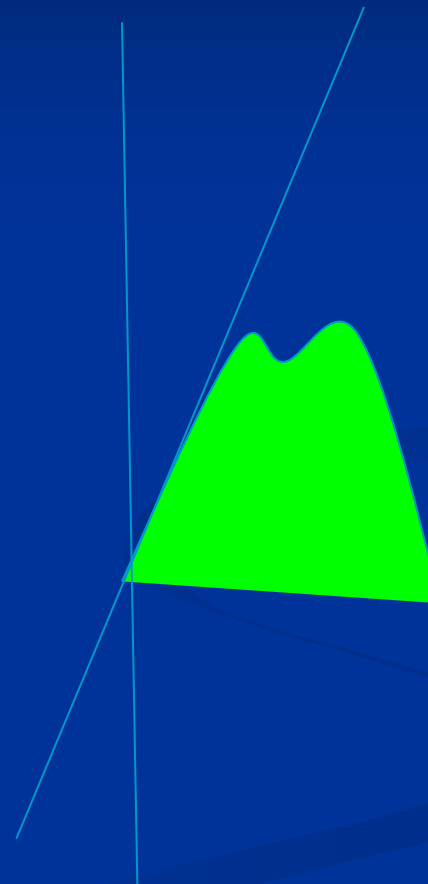
Angle of convergency

6-15°



Conventional cementation

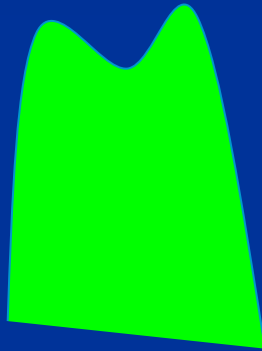
15-24°



Adhesive cementation

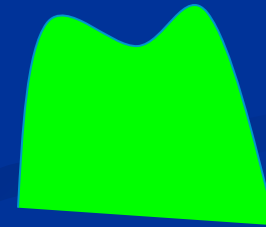
Amount of hard dental tissue – how is the prepared tooth high

5 mm



Konvenčně

3mm



Adhezivně

Adhesive dentures with metal framework

Adhesive dentures with metal framework

Splints

Adhesive bridges

Preparation

In enamel (0,3 -0,5 mm)

Removal of old fillings

Adhesion compensates smaller retention area

The construction must be primary stable

Adhesion is primery mechanical

The thickness of the metal framework is 0,5 mm

Indication

- ✓ 1 missing tooth in posterior area
- ✓ 1 - 2 tooth missing in frontal area

Conditinos:

The gap is not bigger than 2 cm (posterior area)

The prognosis of pilots is equal

*The conditions for adhesive technology are good
(dry operating field)*

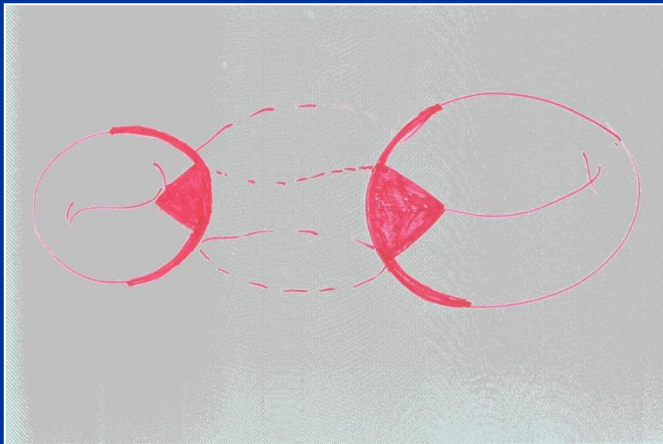
Risks and benefits of adhesive dentures with metal framework

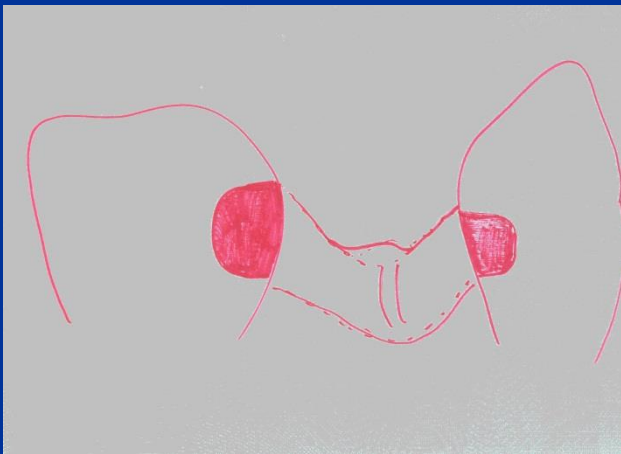
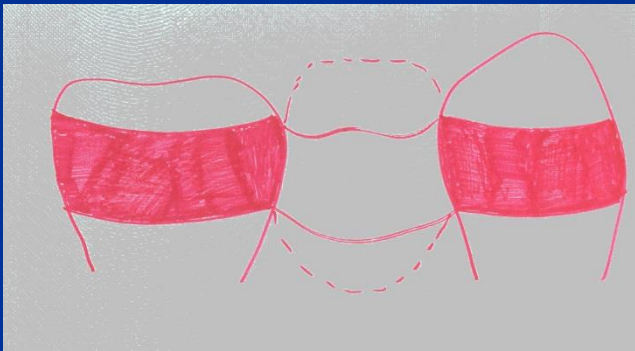
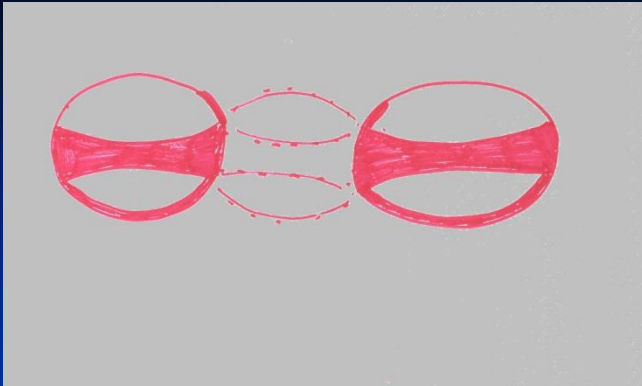
- Minimally invasive preparation
- Aesthetics is not optimal
- Risk of secondary caries
- Semipermanent solution

Adhesive bridge: Maryland bridge

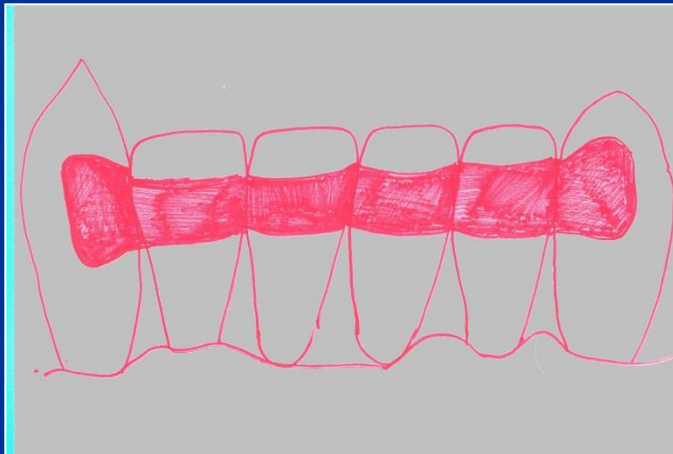
Small area for retention

Insufficient stabilization



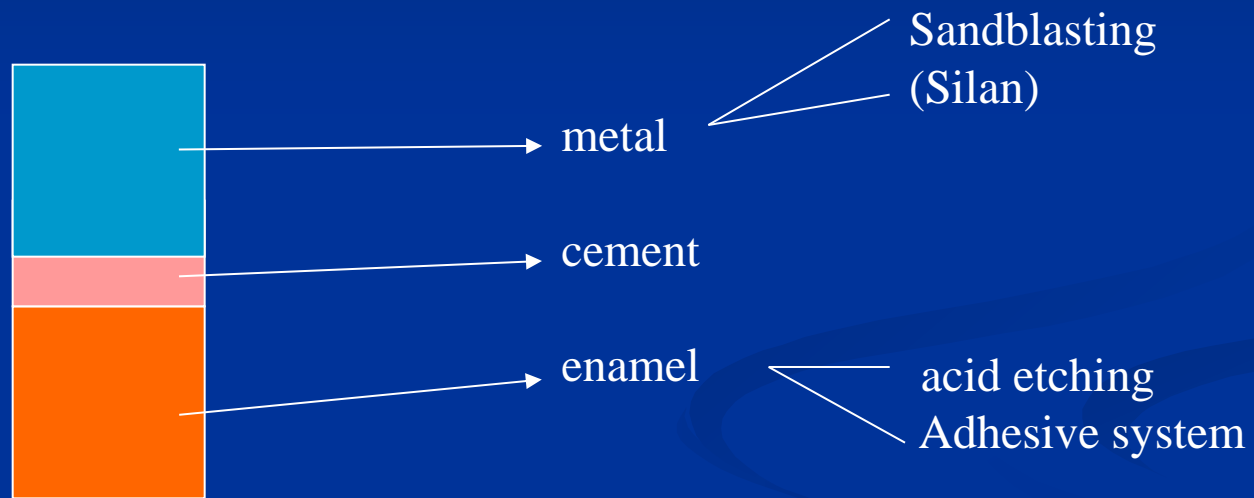


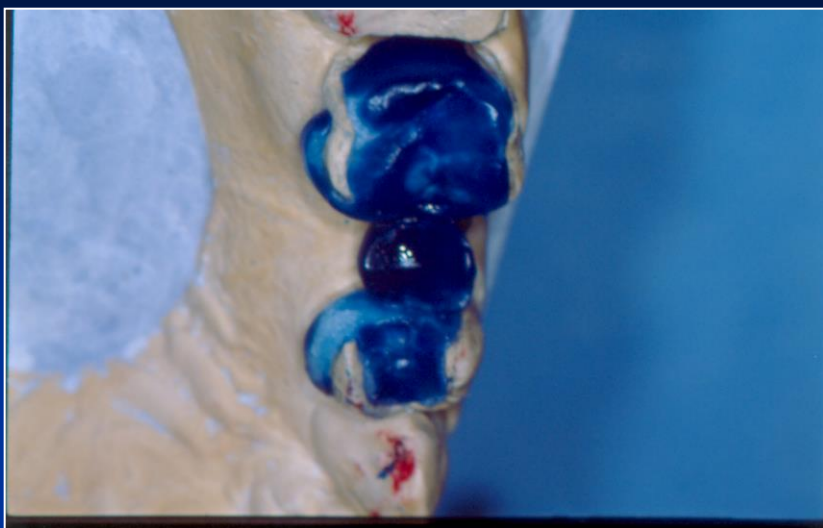
Adhesive brisge with the metal framework well stabilized against horizontal forces

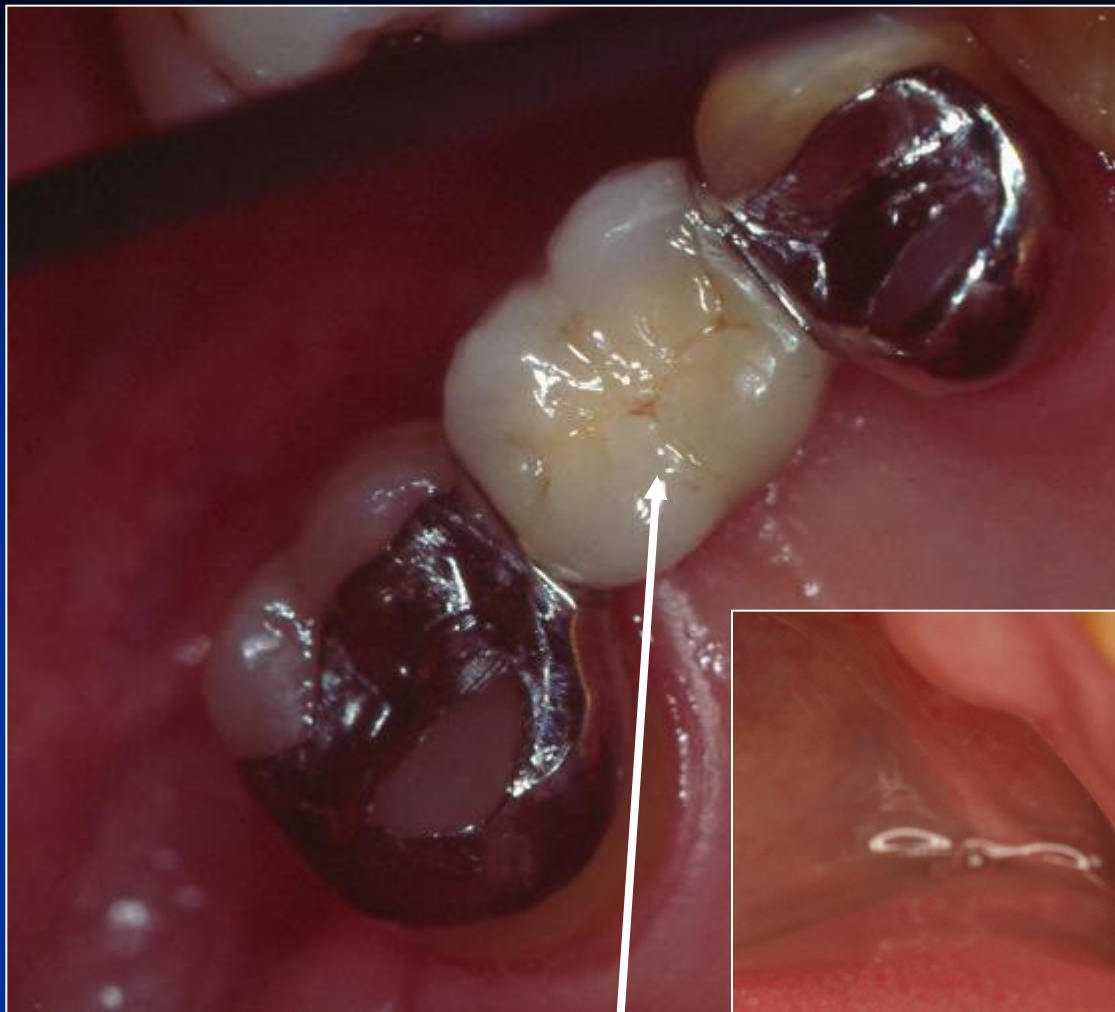


Adhesive splint with
the possibility
of replacement of 1-2 teeth

Adhesive connection







Ceramic pontic

Resin pontic





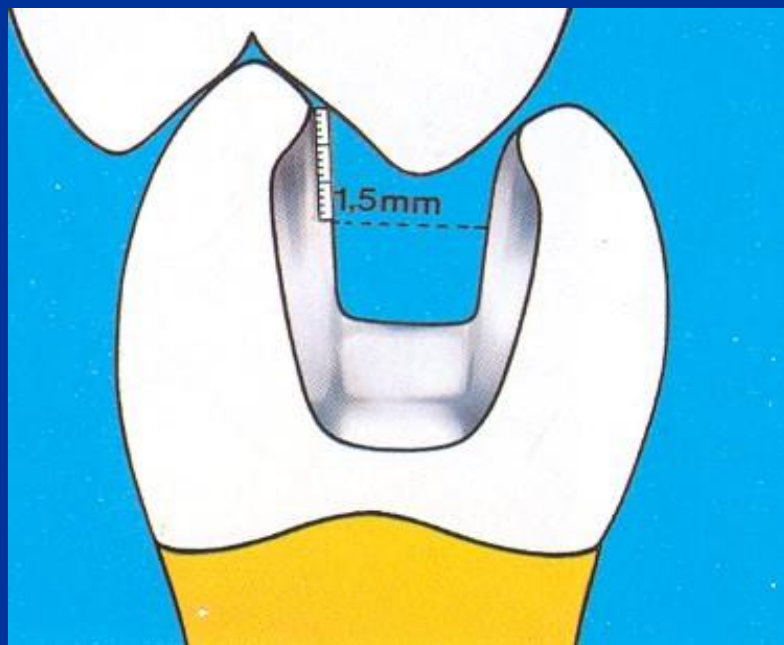
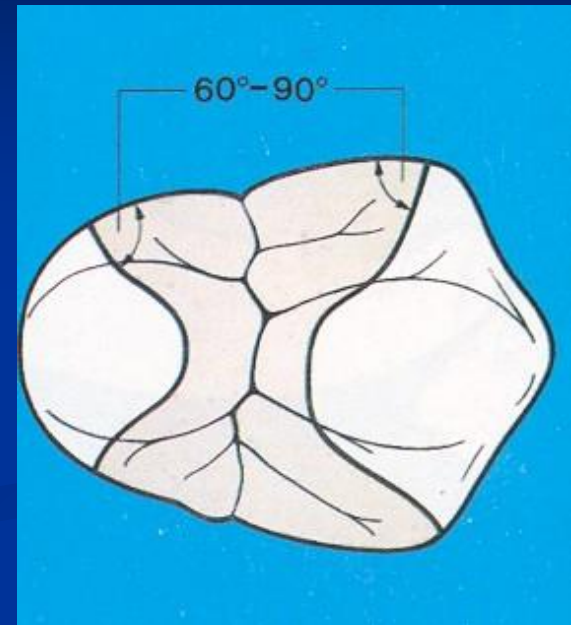
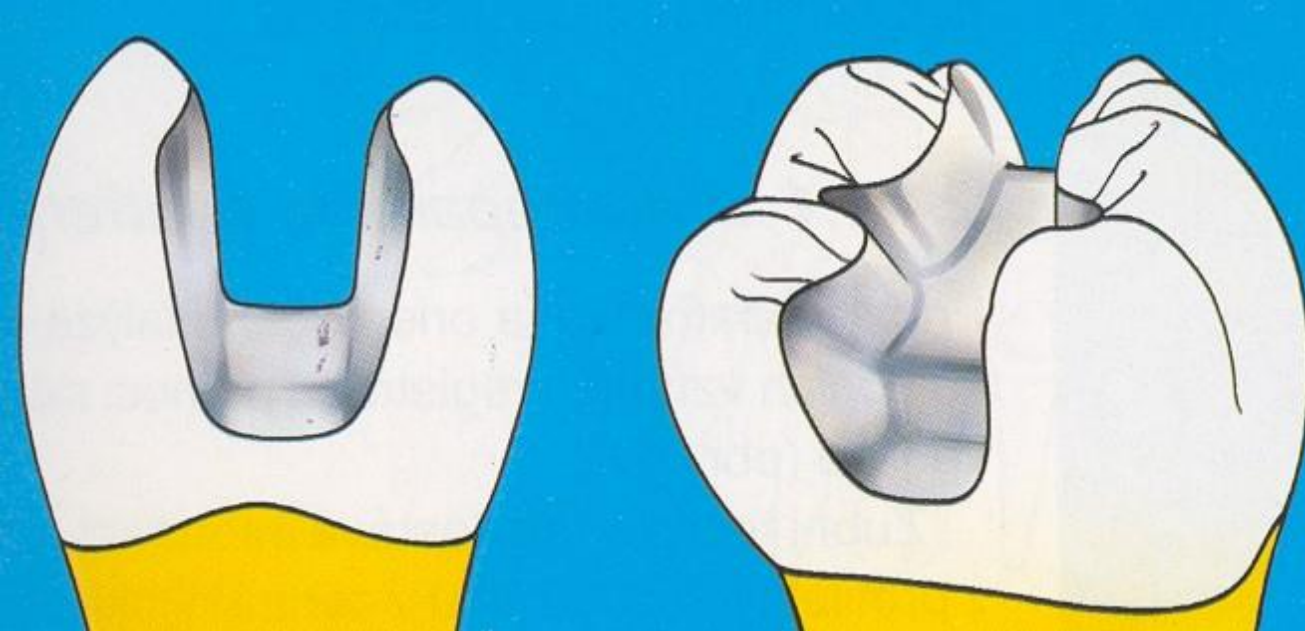


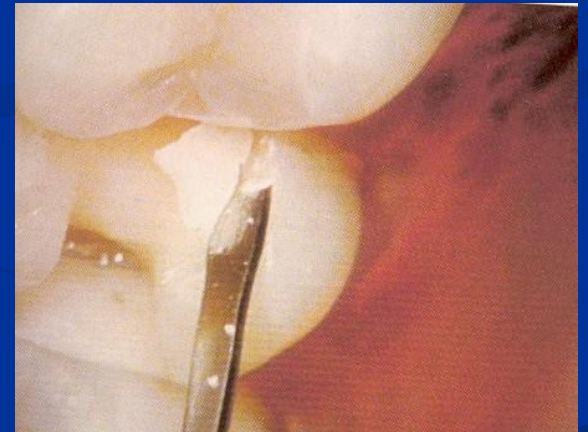
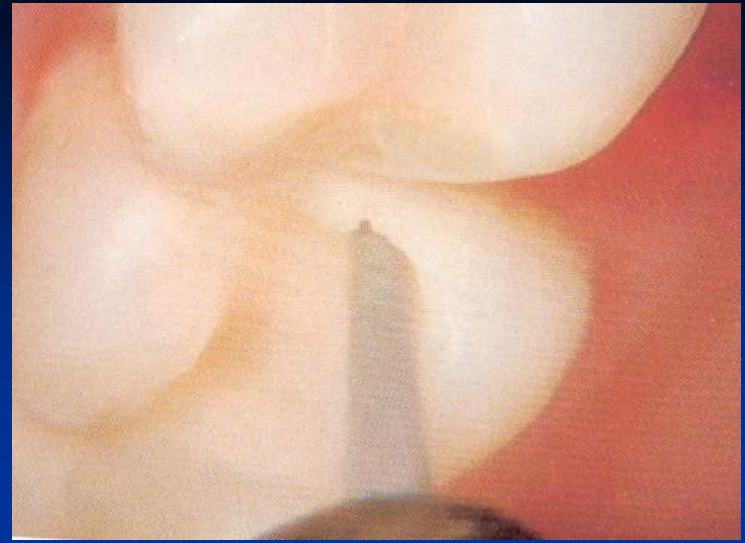
Marginal diskoloration



Non metallic adhesive dentures

- Inlays, onlays
- Inlay bridges
- FRC posts









+



One tooth replacement

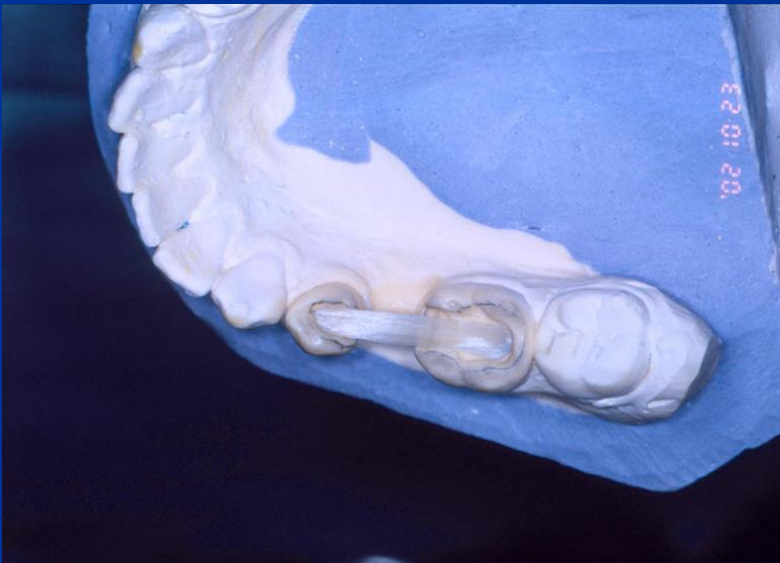
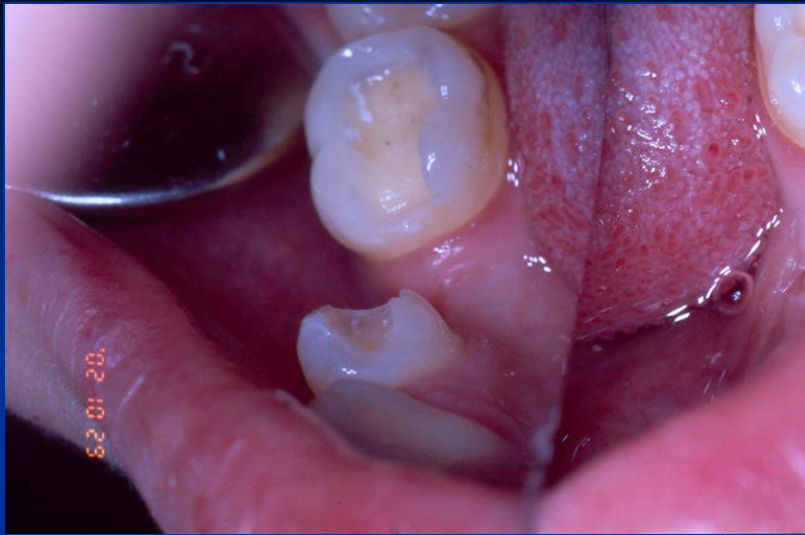


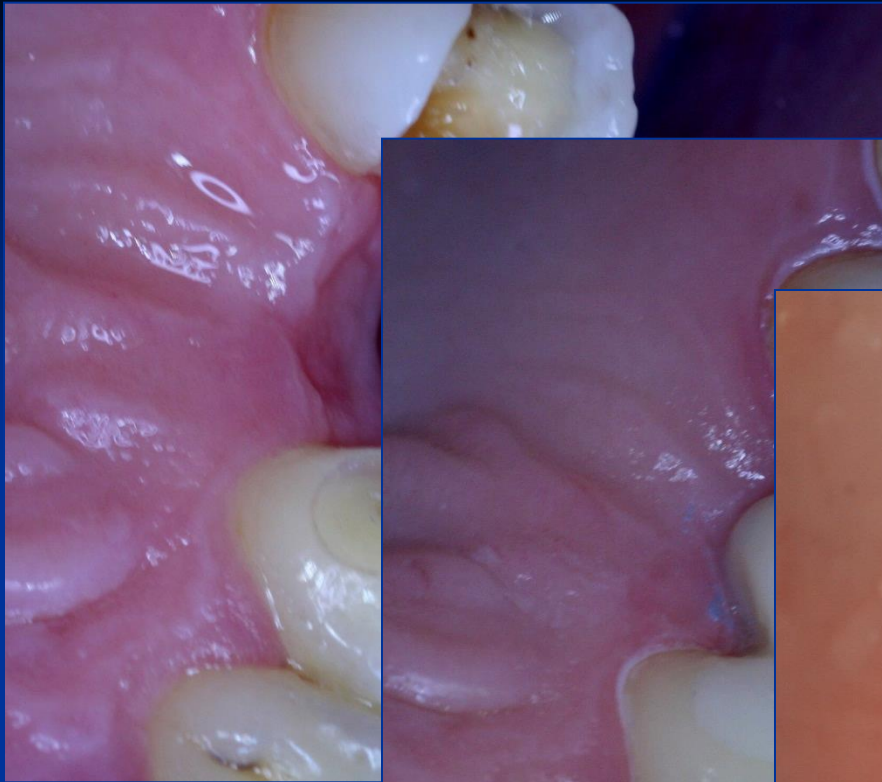
One tooth replacement – adhesive bridge



Adhesive bridges





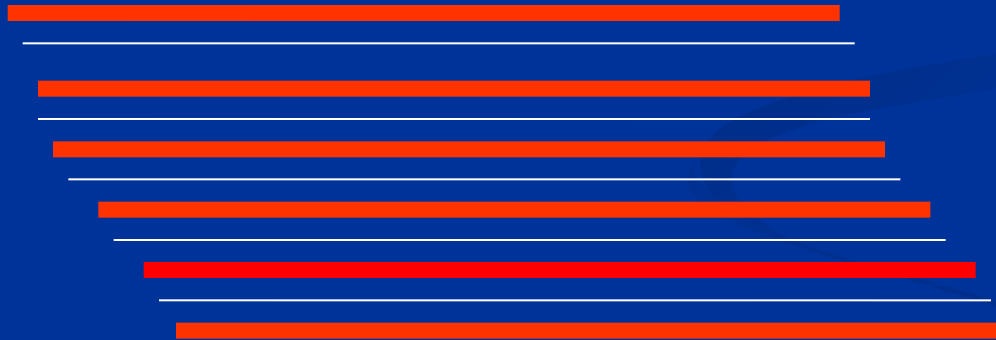


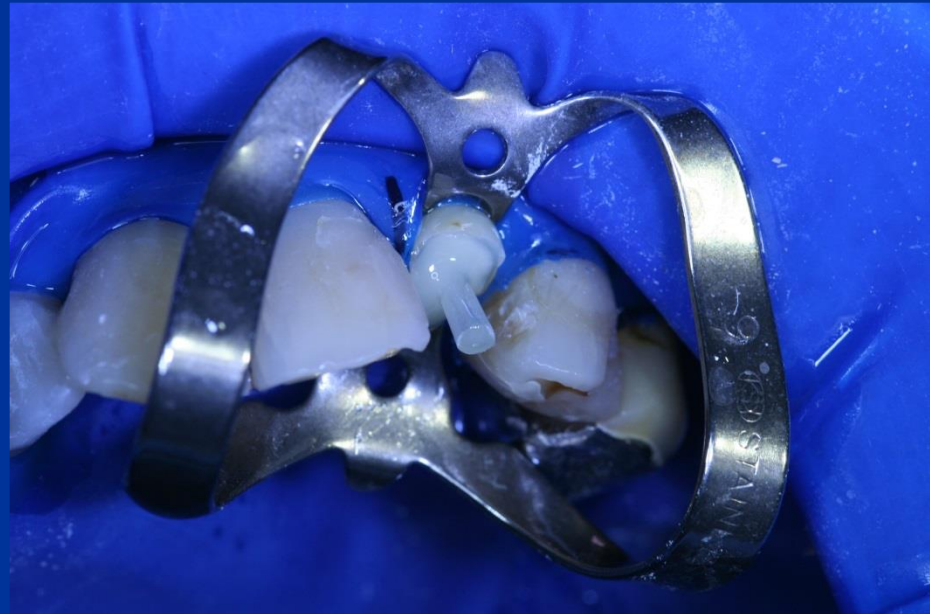
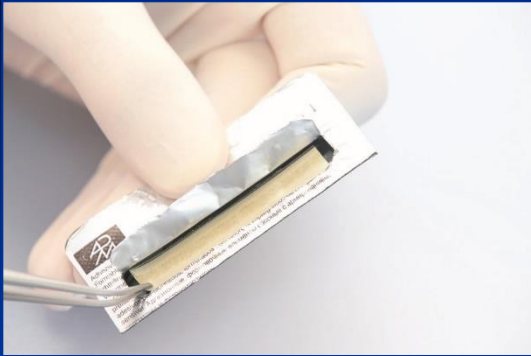





FRC

Filler - fibers





FRC x PFC composites



Surface friction between
matrix and filler –
reinforcement
Anisotropy



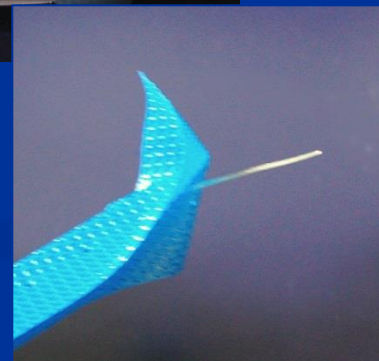
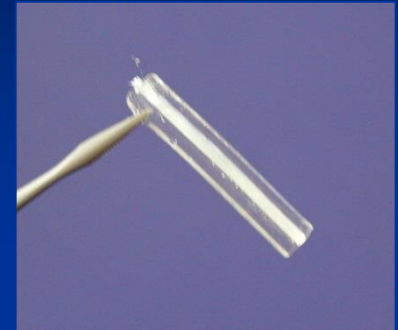
Surface friction is minima
Isotropy



Always combination



Products





One tooth replacement

Location of FRC

Preparation

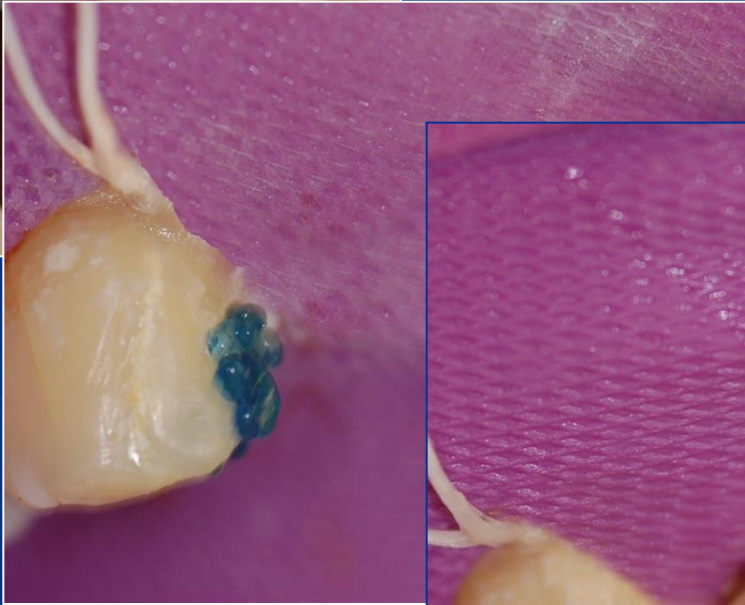
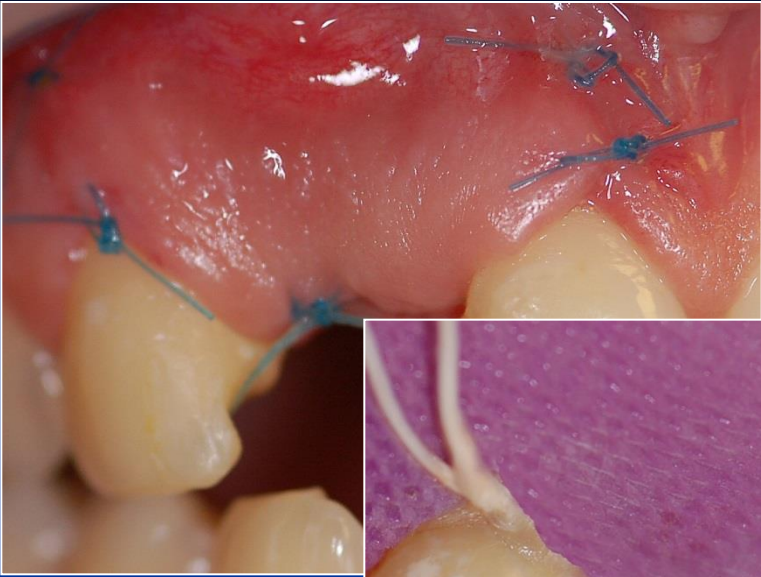
Adhesion

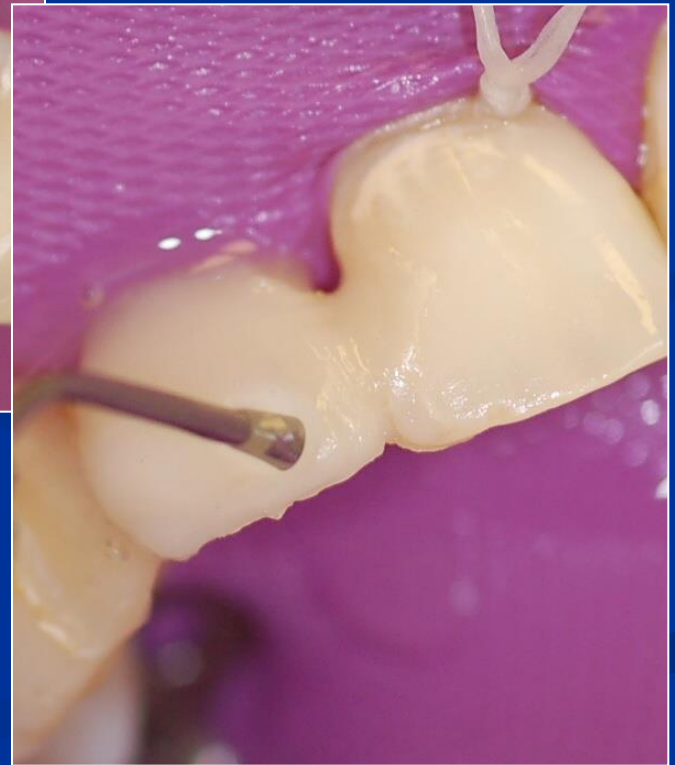
Placement of the arteficial tooth

PFC composite on the top

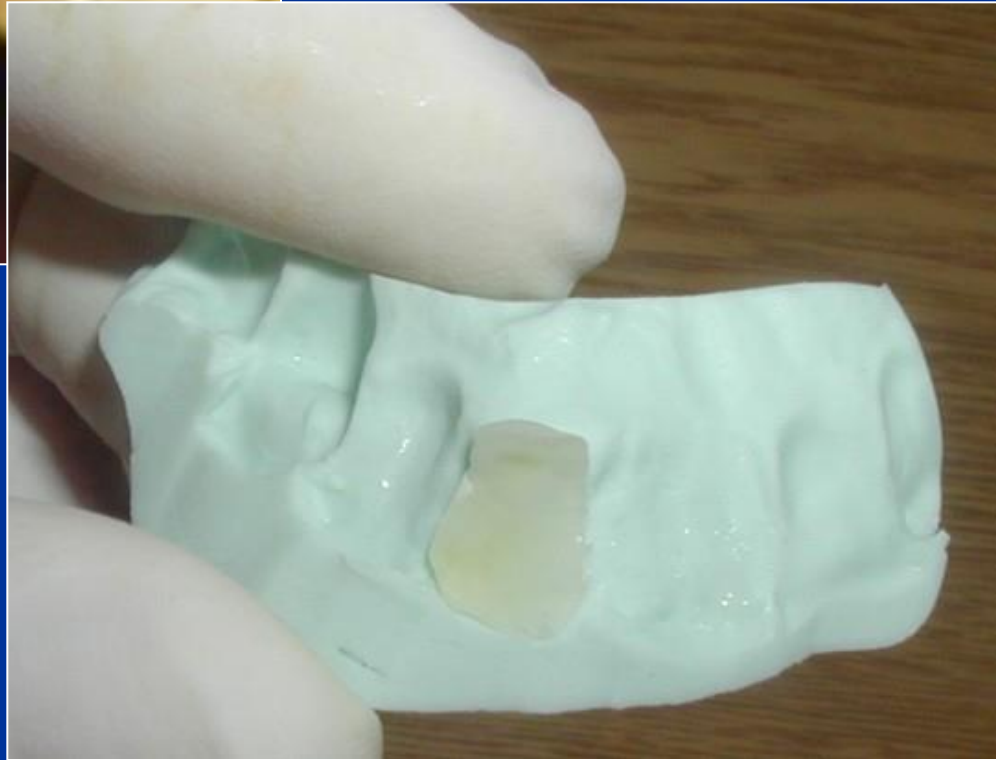












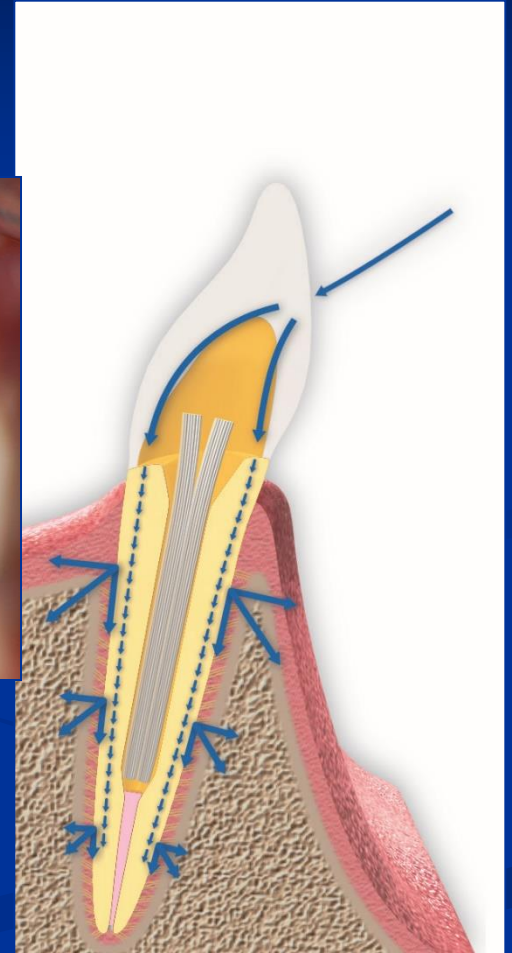
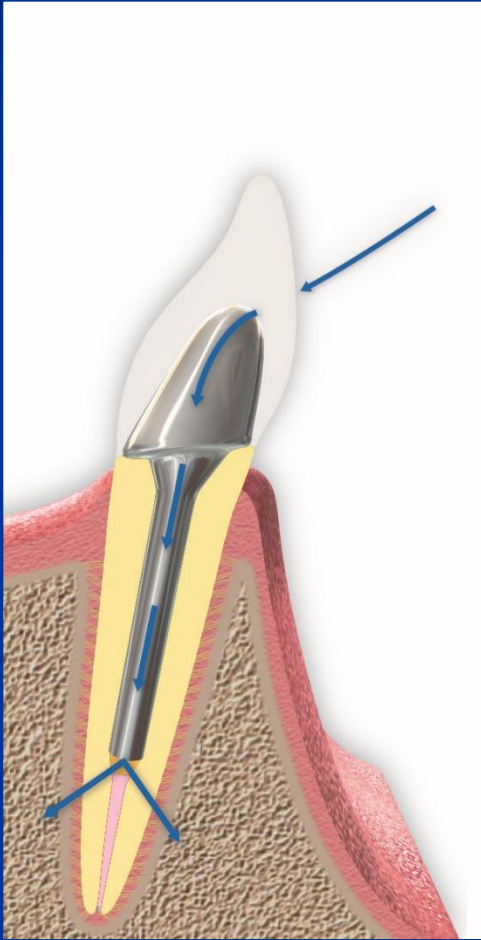


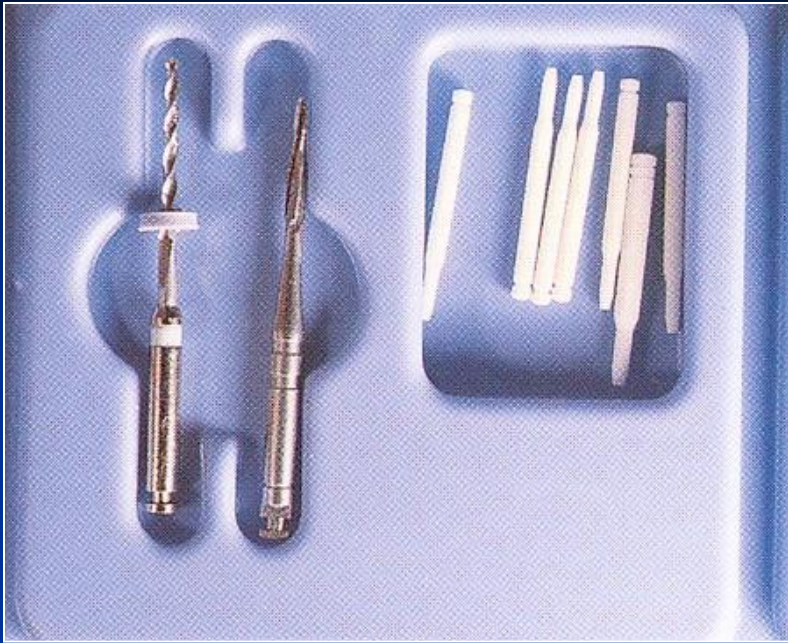




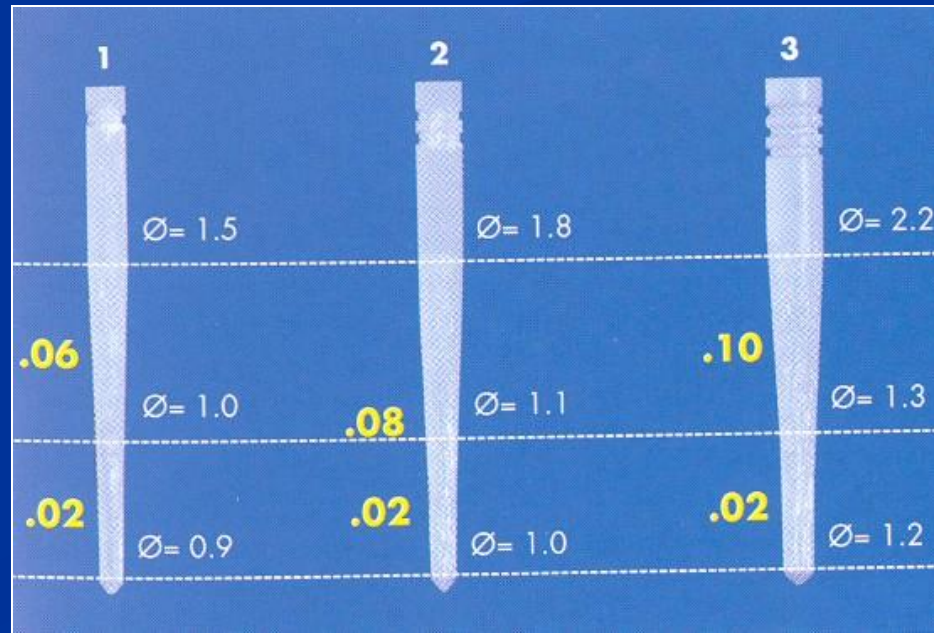


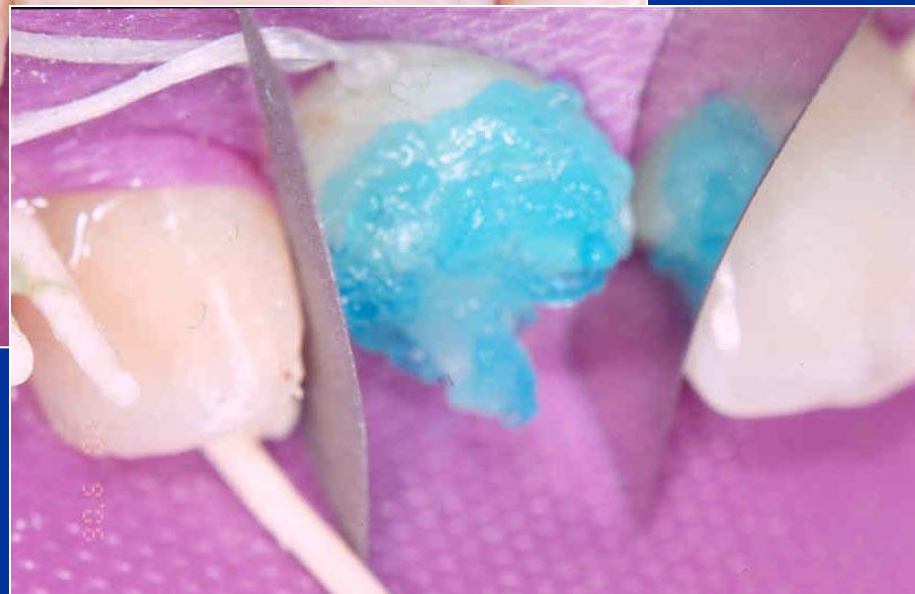
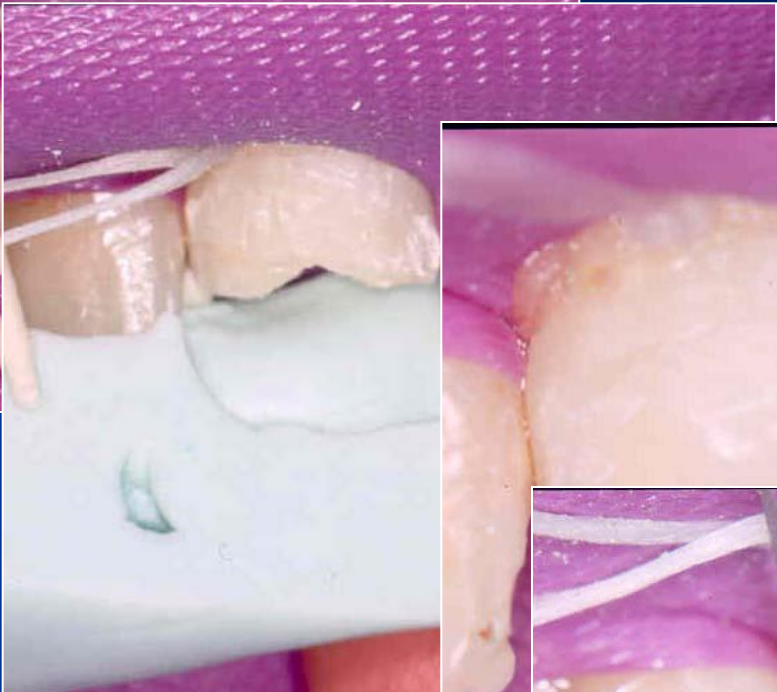
FRC posts – postendo treatment





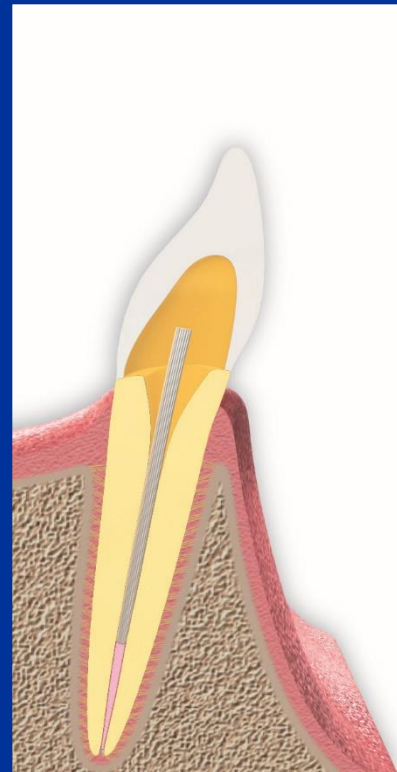
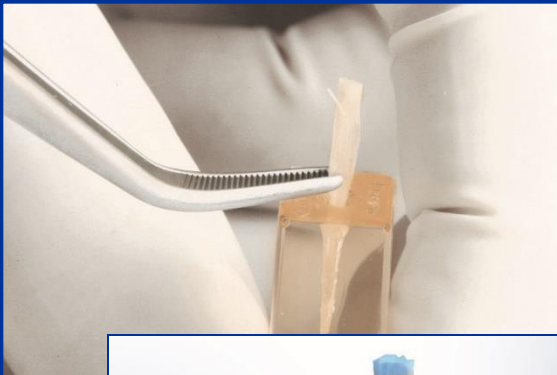
White Light

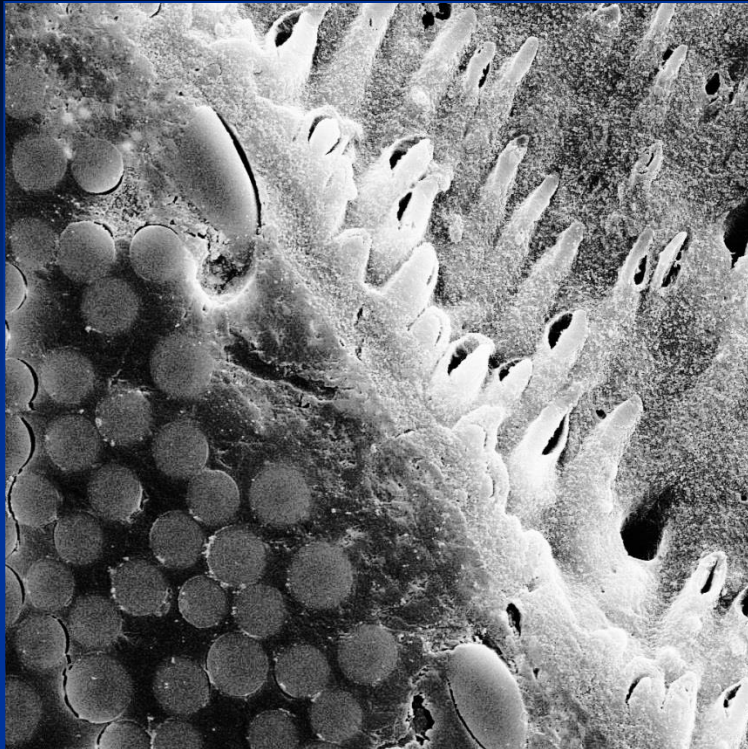




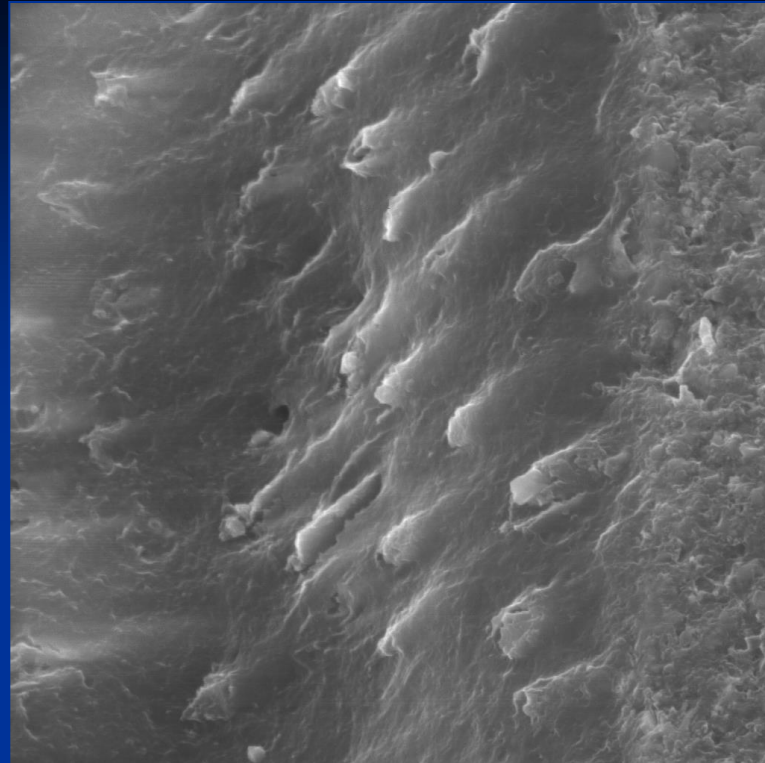


Individually made FRC posts



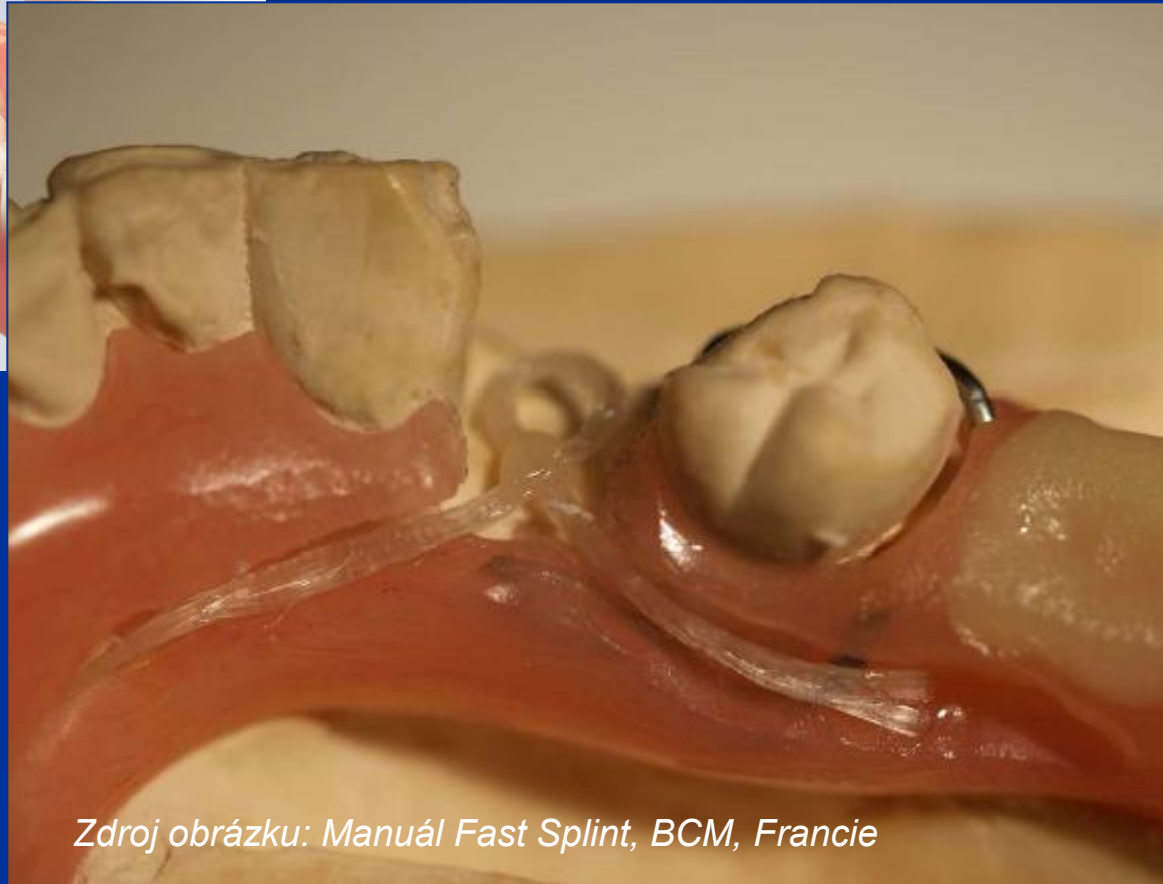


SEM MAG: 4.00 kx DET: SE Detector 20 um Vega ©Tescan
HV: 20.0 kV DATE: 06/19/07 Digital Microscopy Imaging
VAC: HiVac Device: TS5136XM



HV: 20.0 kV DET: SE Detector 20 um Satellite ©Tescan
DATE: 05/22/06

Repair od dentures



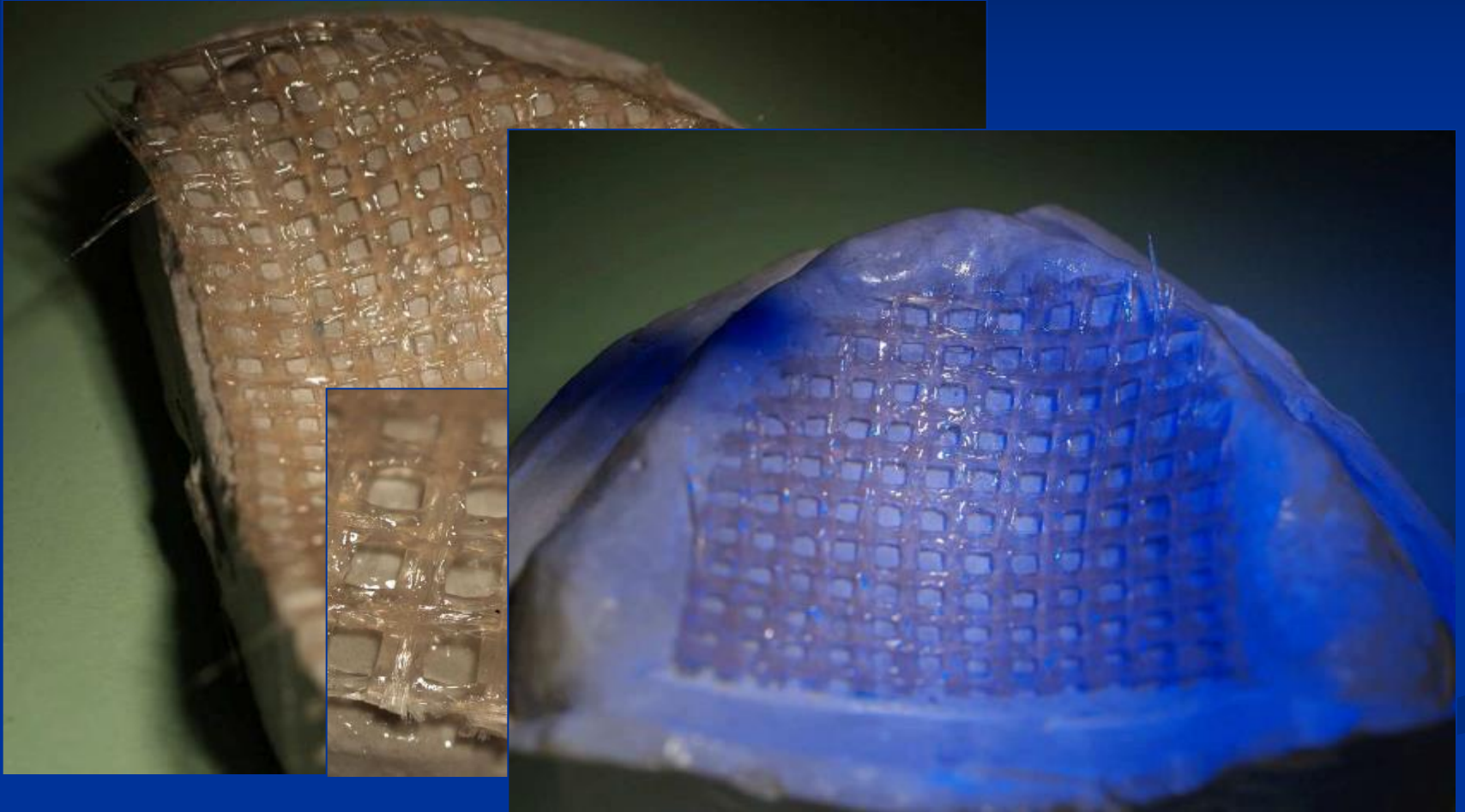
Zdroj obrázku: Manuál Fast Splint, BCM, Francie



Repair od dentures



Reinforcement



Products

