

Adhesive cementation



ADHESIVE cementation

- Fixed dentures can be 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

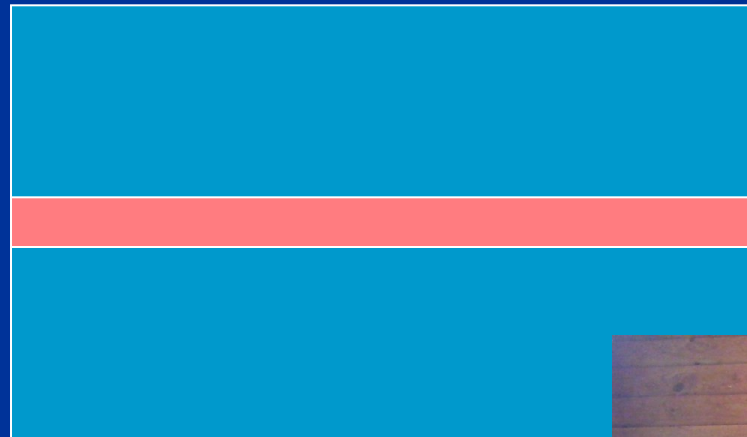


Adhesion

Ability of two materials to be connected
(glue)

➤ Adhesive

➤ Adherend



Adhesion

➤ Mechanic

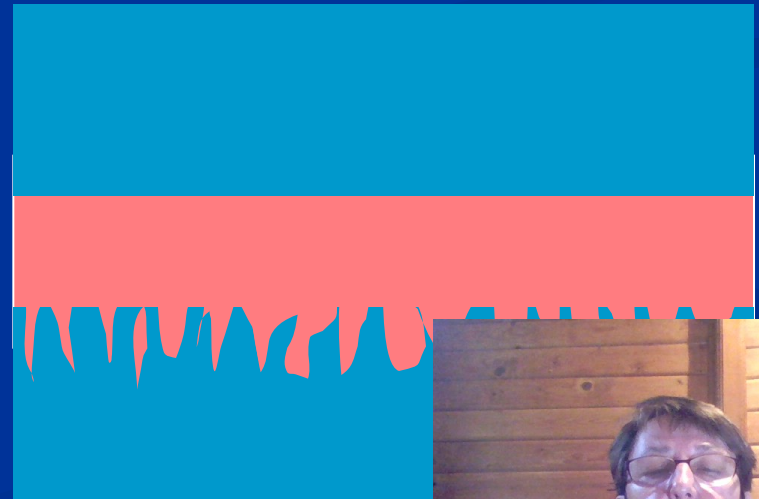
➤ Specific



Adhesion

- Mechanic

Is based on the roughness of the surface



Adhesion

➤ Specific

Physical

Chemical



Adhesion

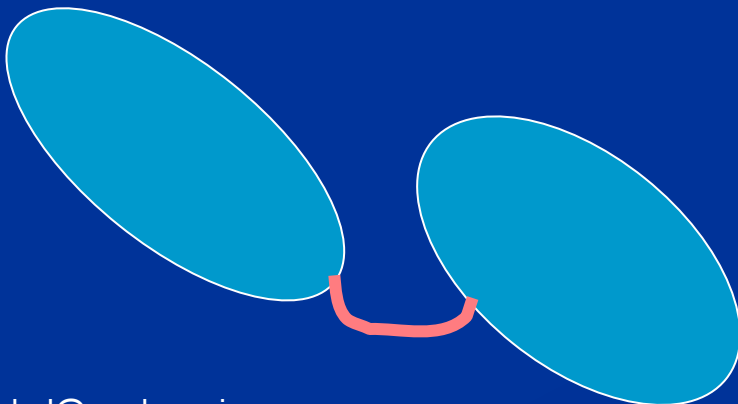
➤ Specific

Fysical – intermolecular forces

Van der Waals

H- bridges

Elektrostatic



Adhesion

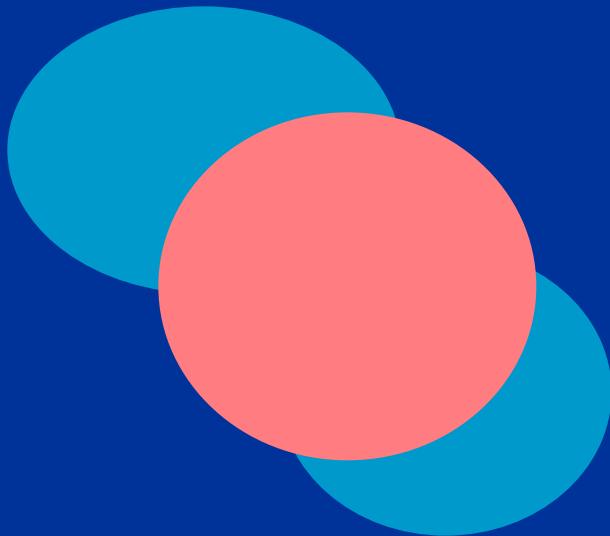
➤ Specific

Chemical binding

covalent

ion

metal



Adhesive treatment in dentistry

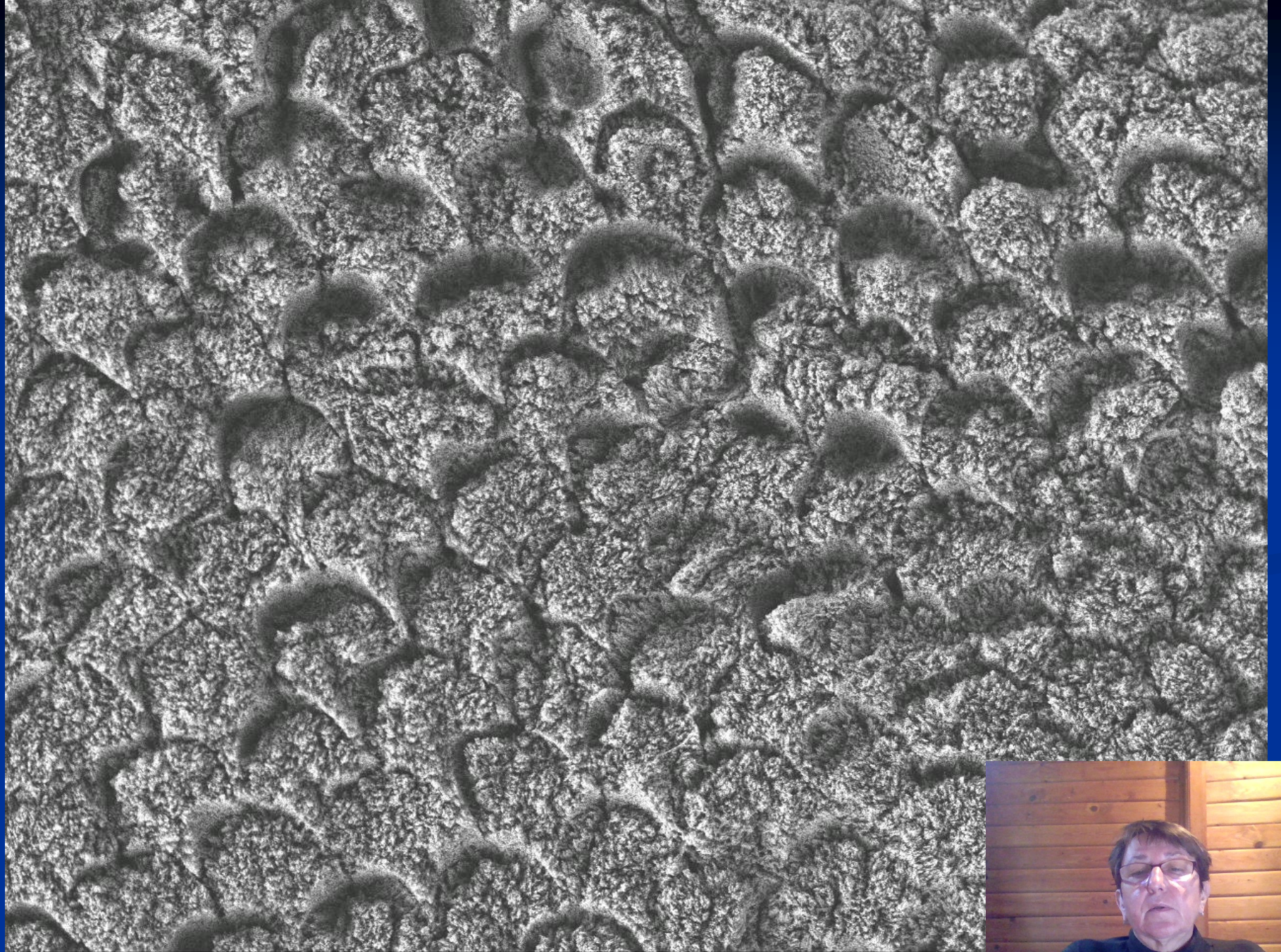
- Sandblasting
- Acid etching
- Elektrolytic treatment
- Laser
- Plasma coating
- Silanization



Adhesive treatment of surfaces in dentistry

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





ISI

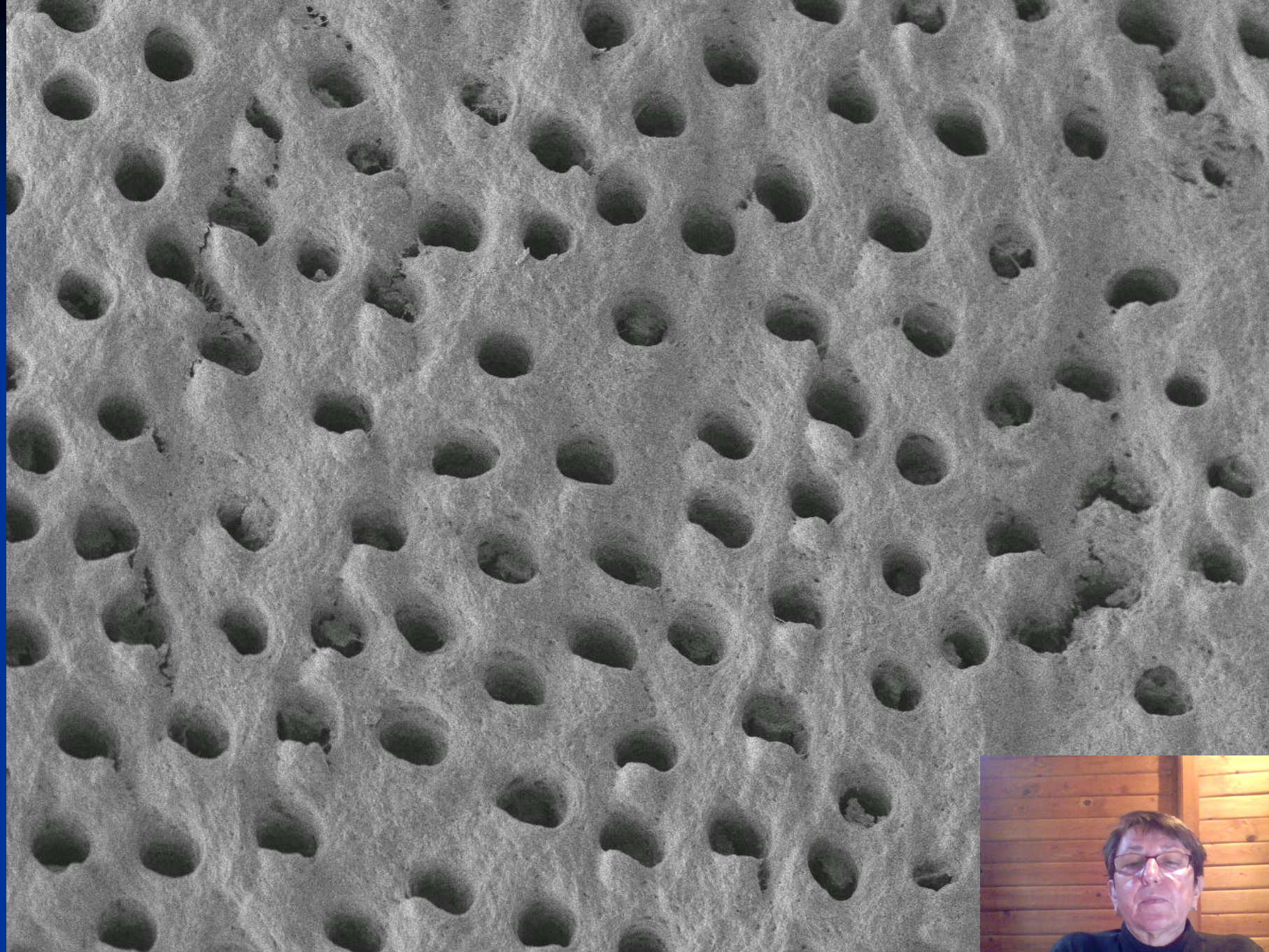
LEI

5.0kV

X2,000

10 μ m





ISI

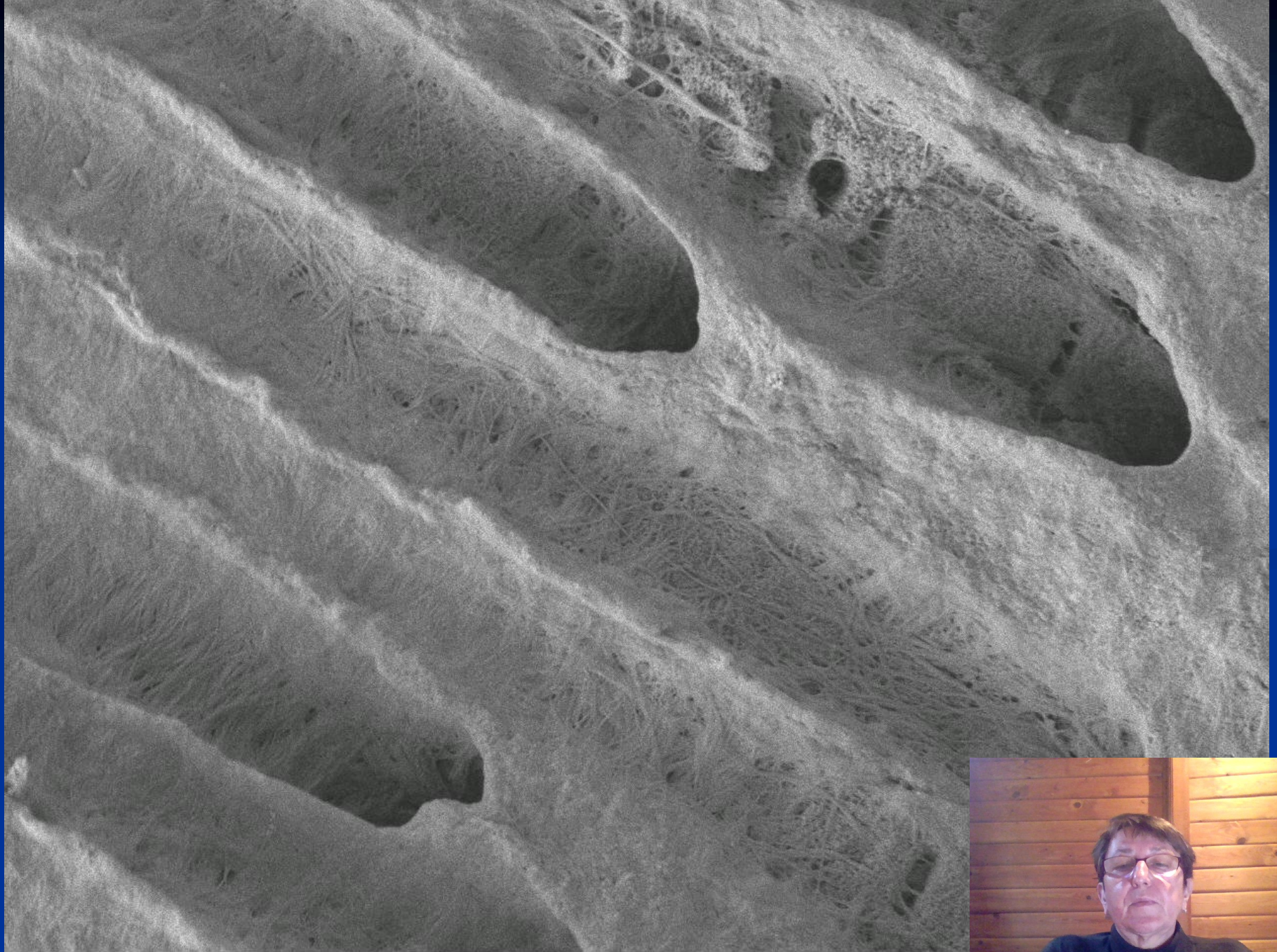
LEI

5.0kV

X2,000

10 μ m





ISI

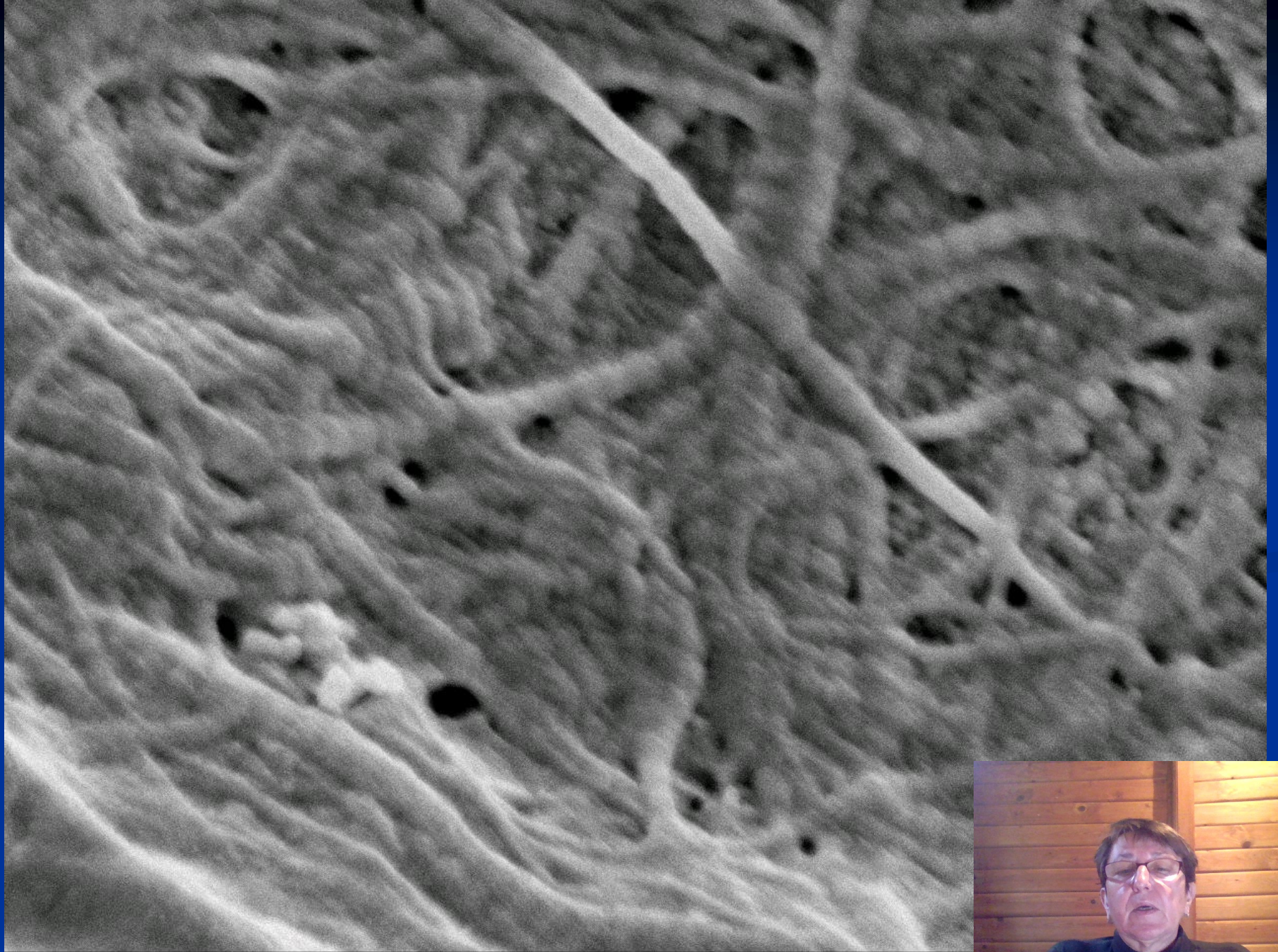
LEI

5.0kV

X5,000

1μm





ISI

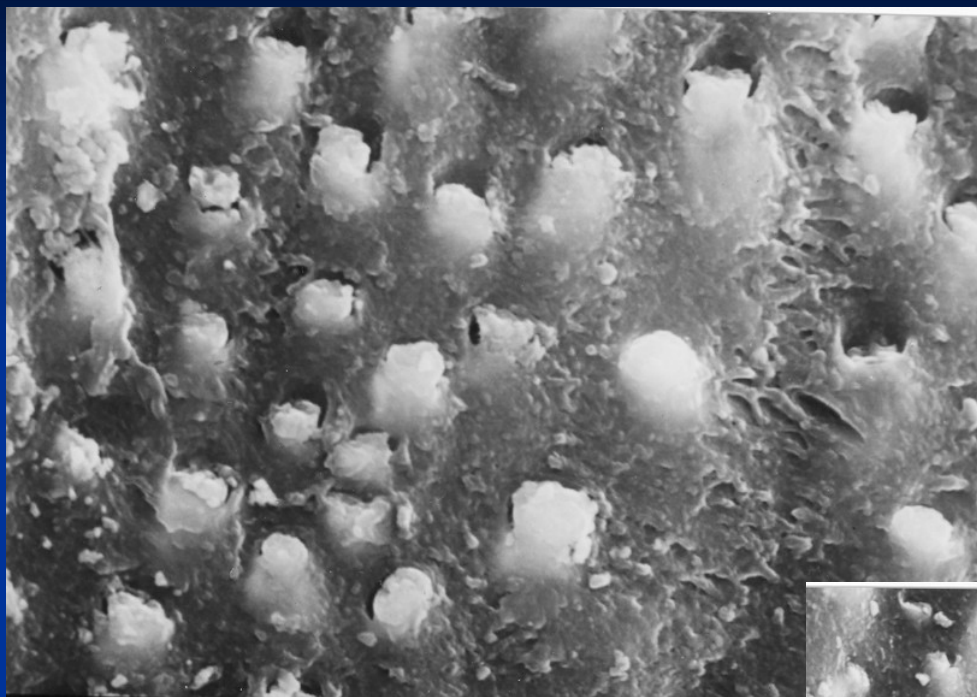
SEI

5.0kV

X55,000

100nm





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)

■ Micromechanically

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

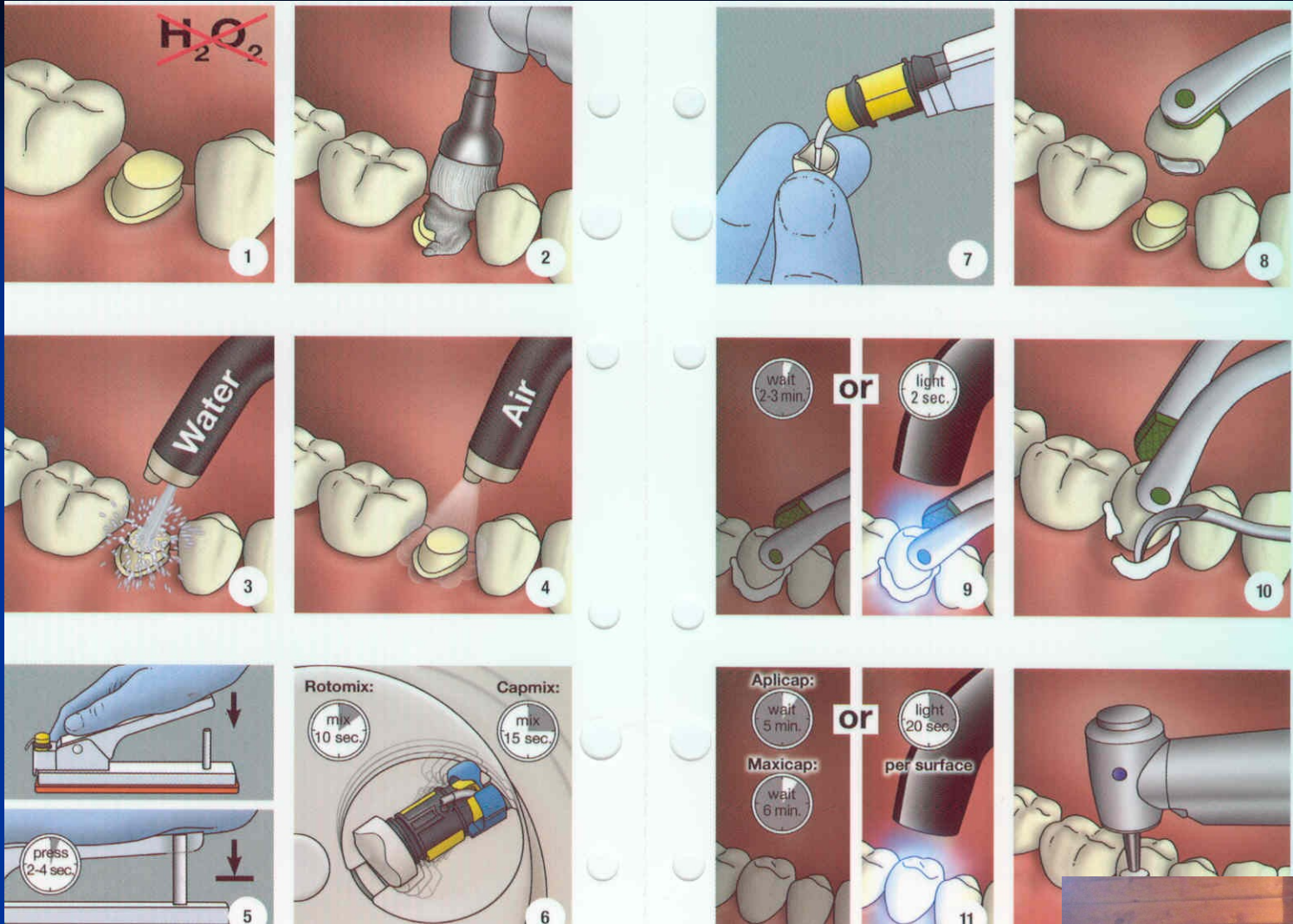


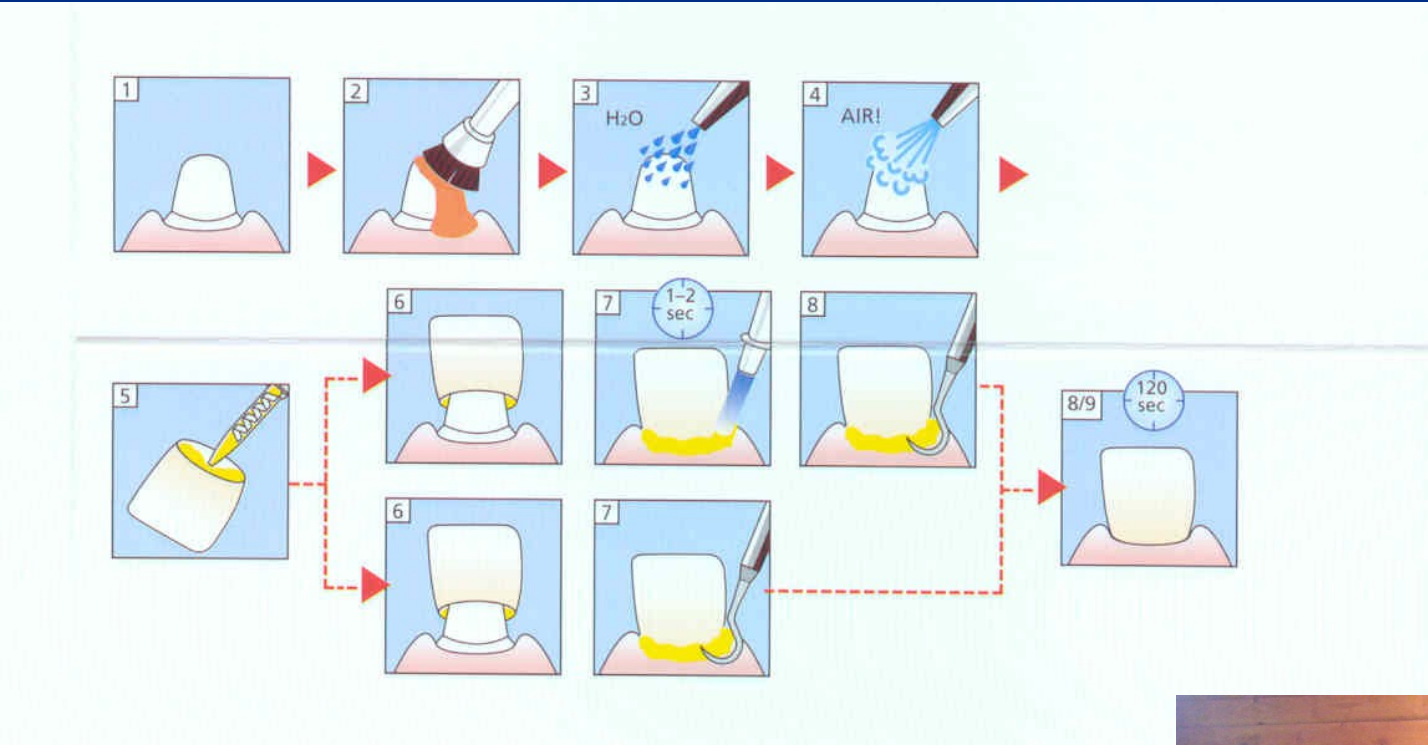




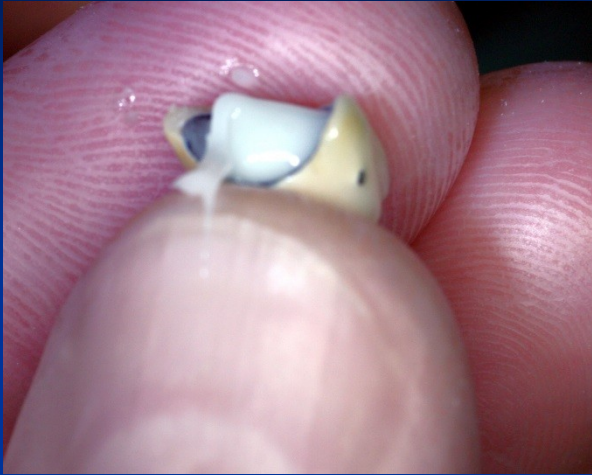












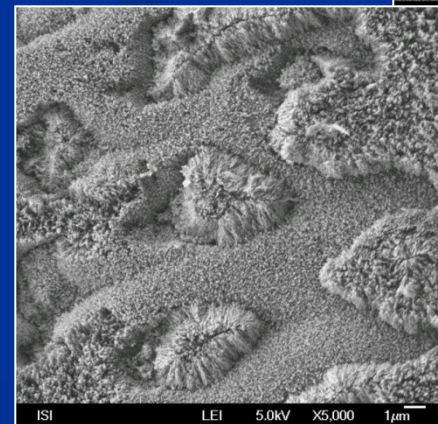
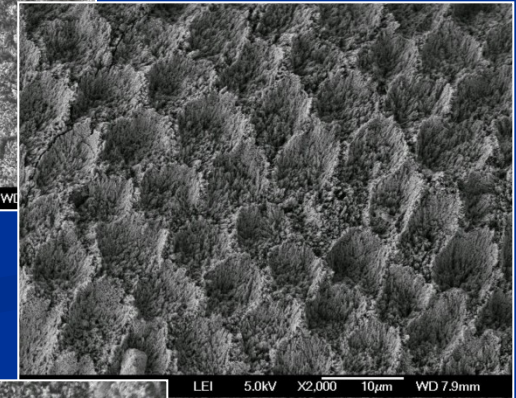
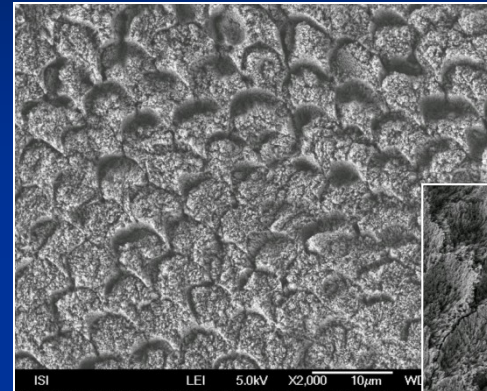
Preparation of surfaces before adhesive cementation

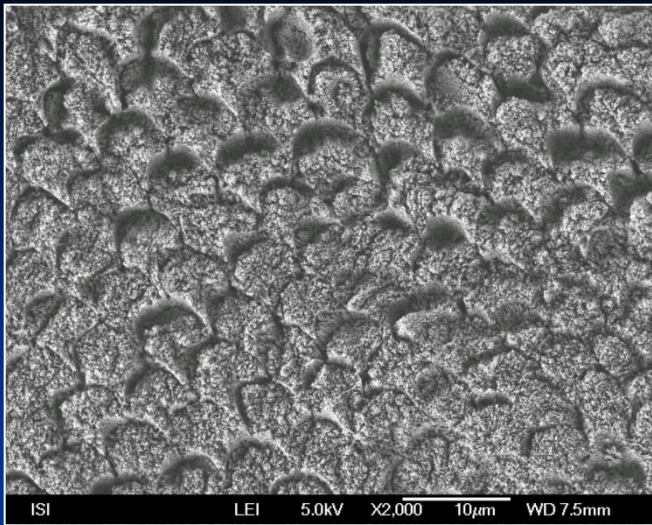
- Enamel
- Dentin
- Ceramic materials
- Composite materials
- Metal alloys



Retentive pattern

- Periprismatic
(Interprismatic)
- Intraprismatic
- Aprismatic





TE

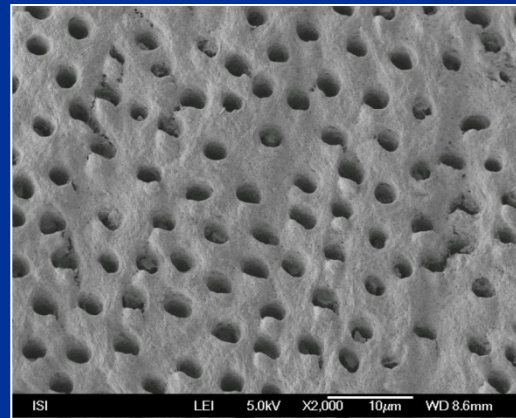
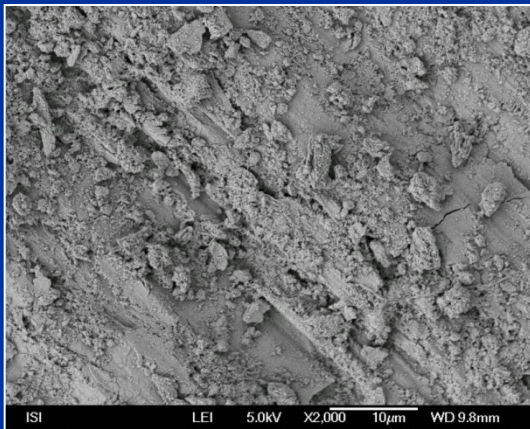


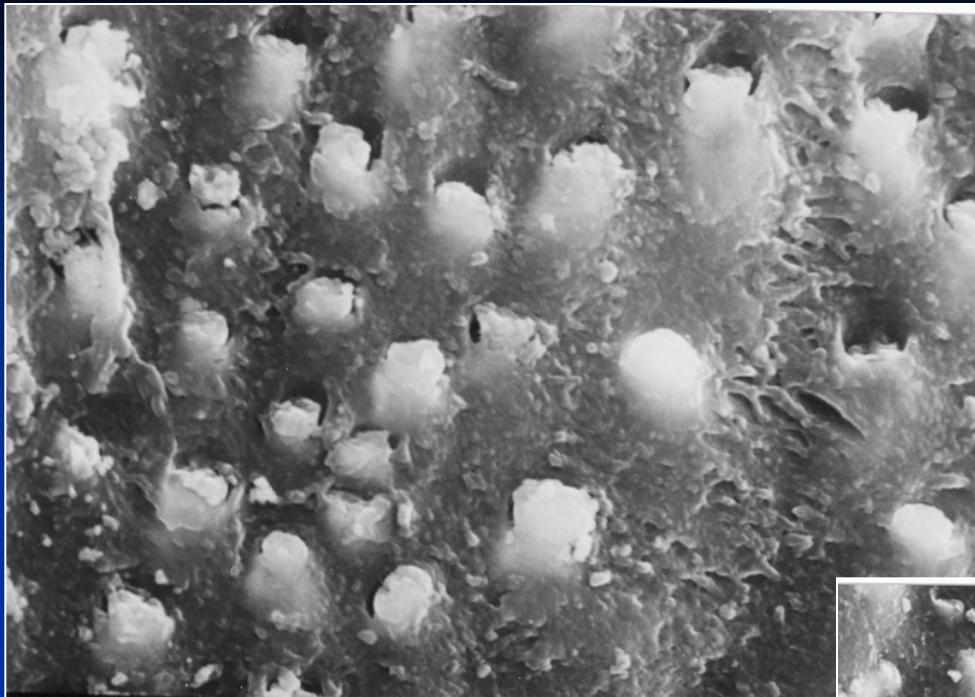
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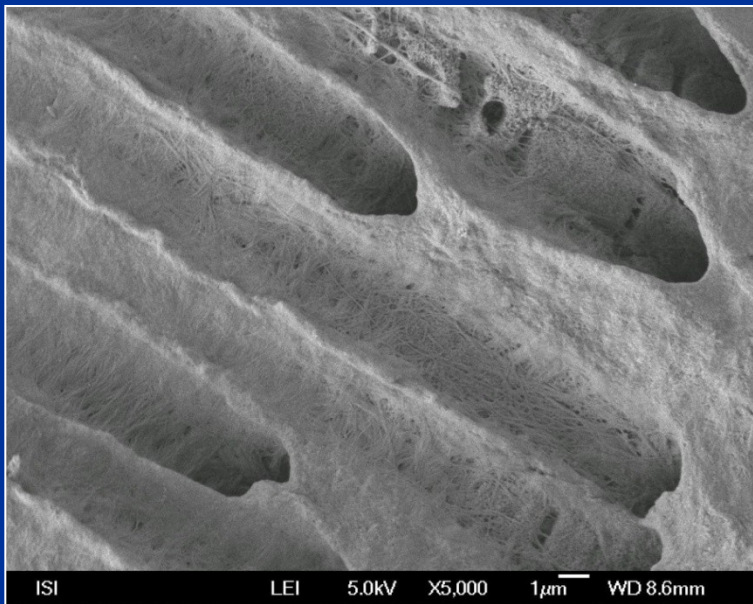
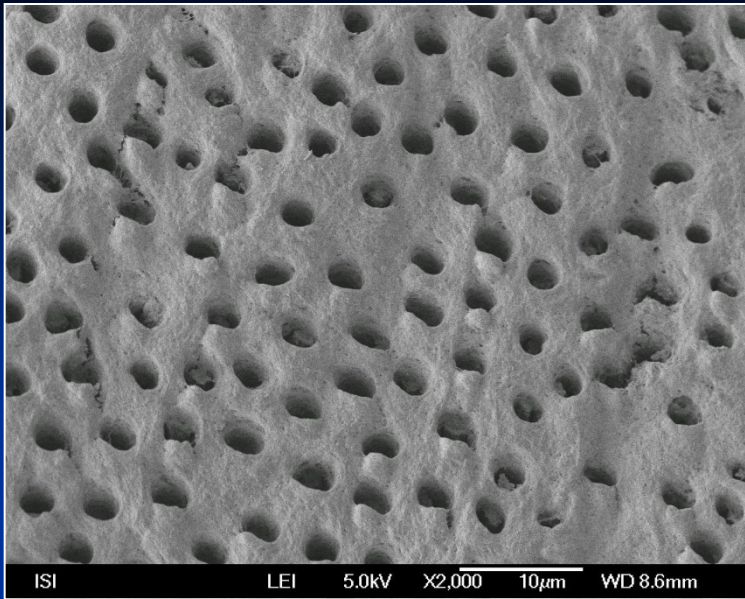


Retentive surface of dentin

- 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



Etching



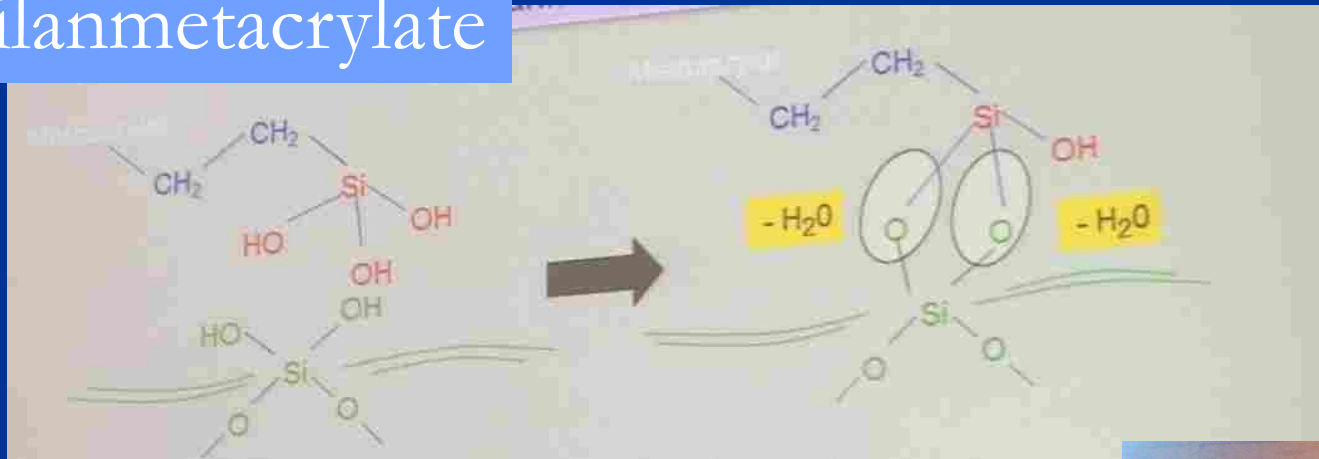
Composite and metal surfaces

- Sandblasting



Chemical adhesive treatment: ceramics, composite

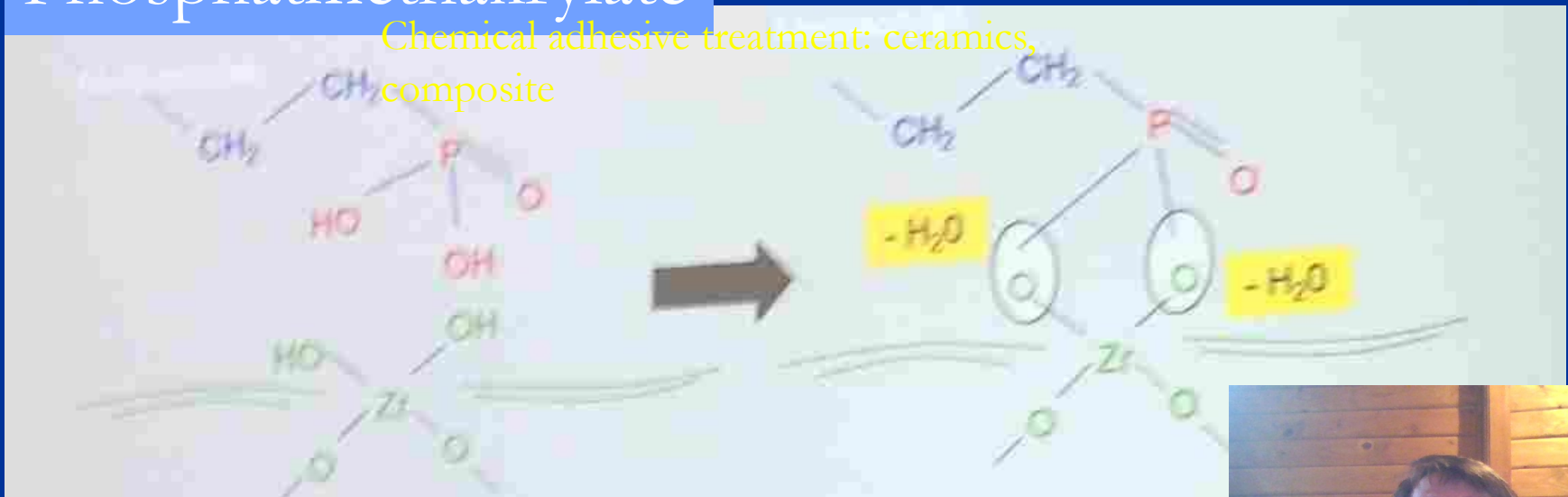
Silanmetacrylate



Chemical adhesive treatment: metal zirconia

Phosphatmethakrylate

Chemical adhesive treatment: ceramics,
composite



Chemical adhesive treatment: 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



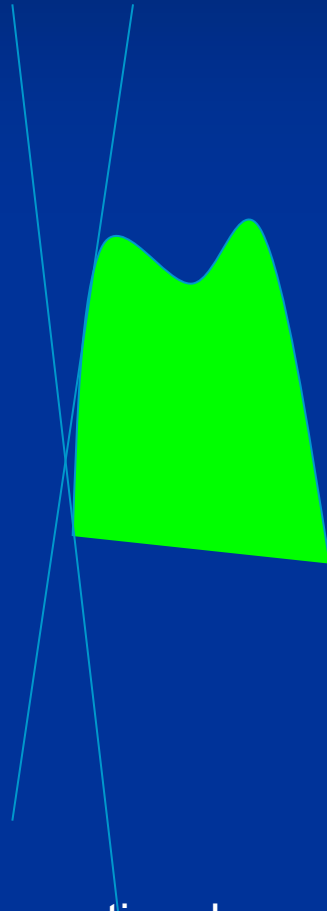
When adhesive cementation

- Area of retention - size
- Geometry of preparation



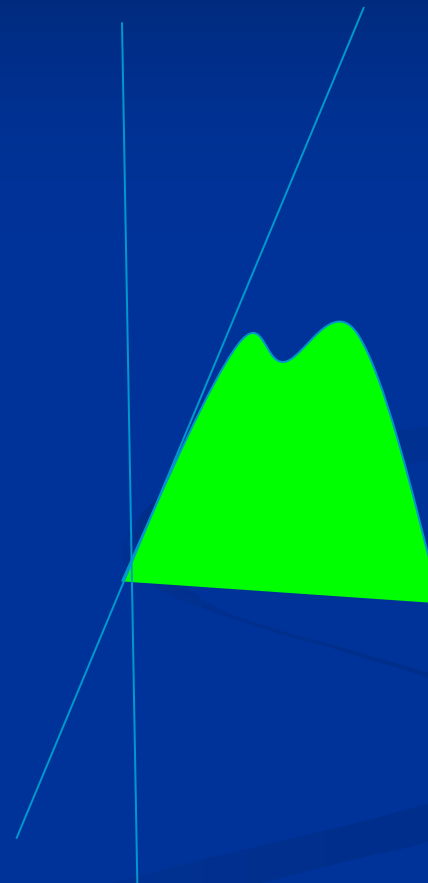
Angle of convergency

6-15°



Conventional cementation

15-24°

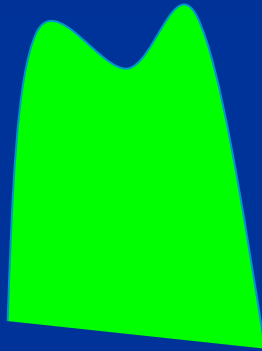


Adhesive



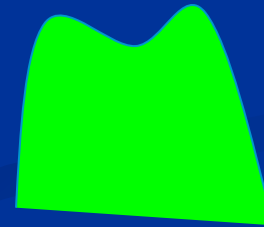
Amount of hard dental tissue – how is the prepared tooth high

5 mm



Konvenčně

3mm



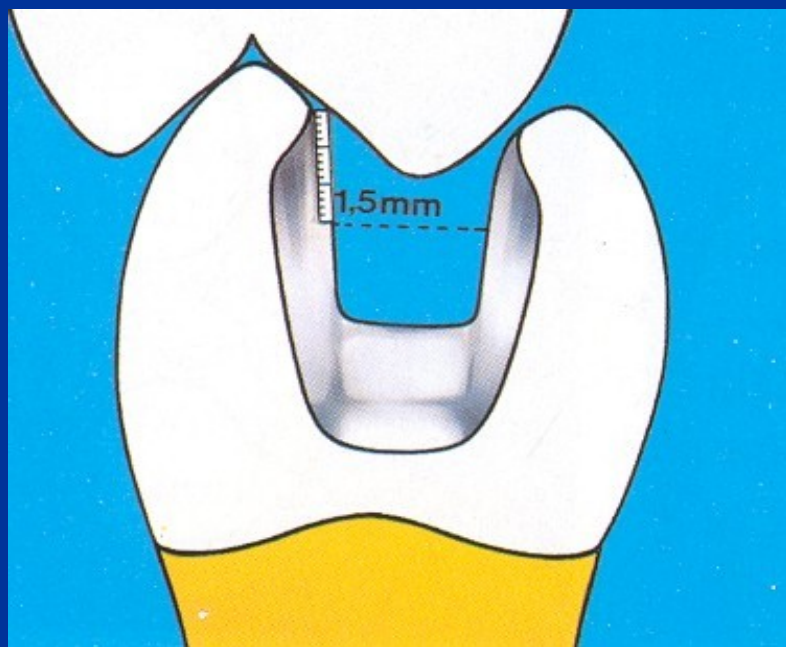
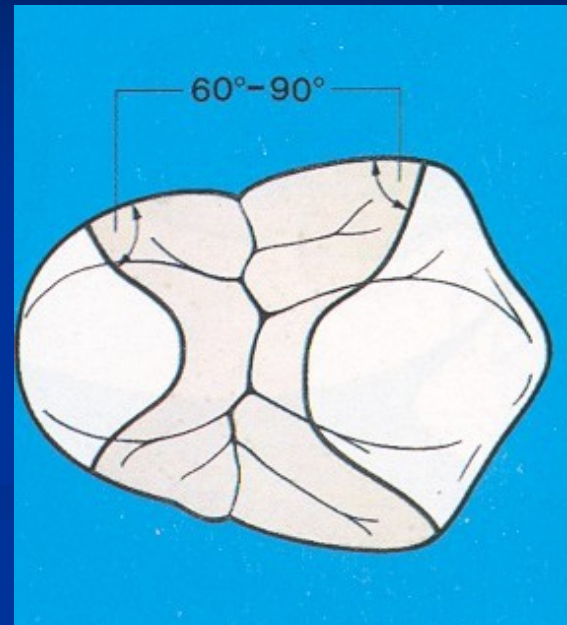
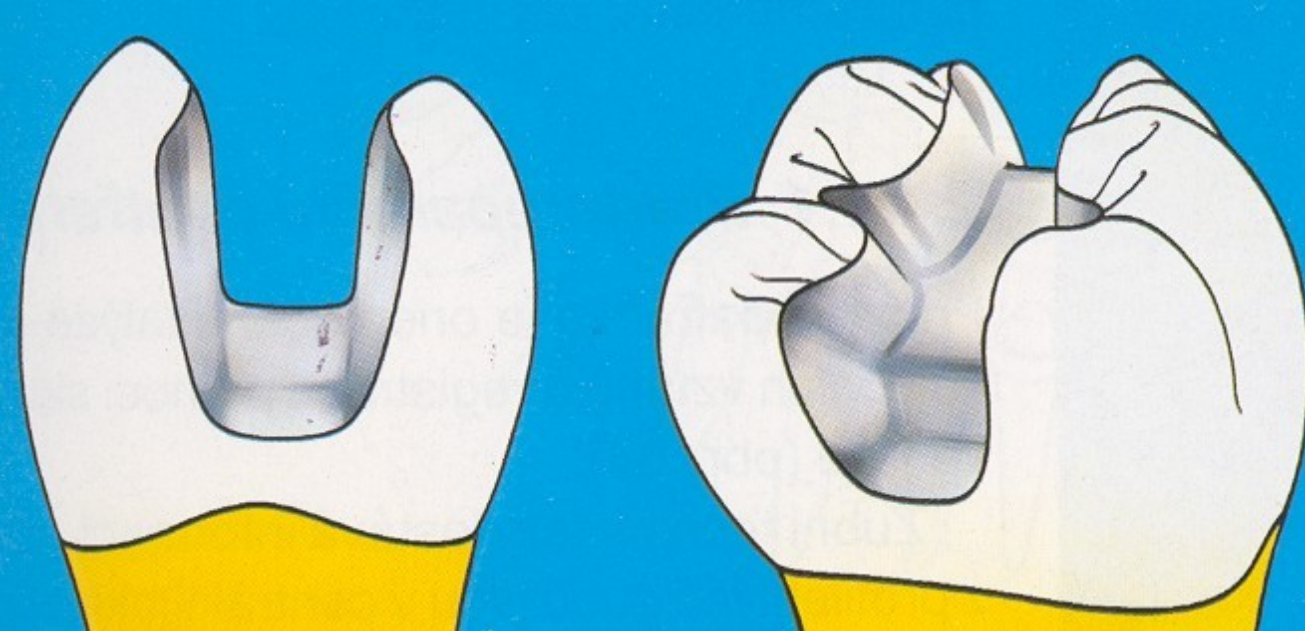
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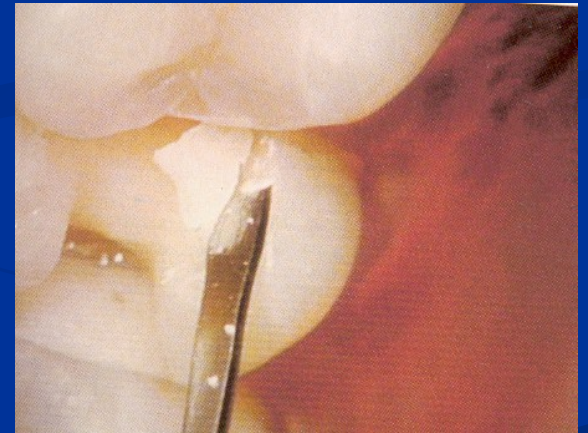
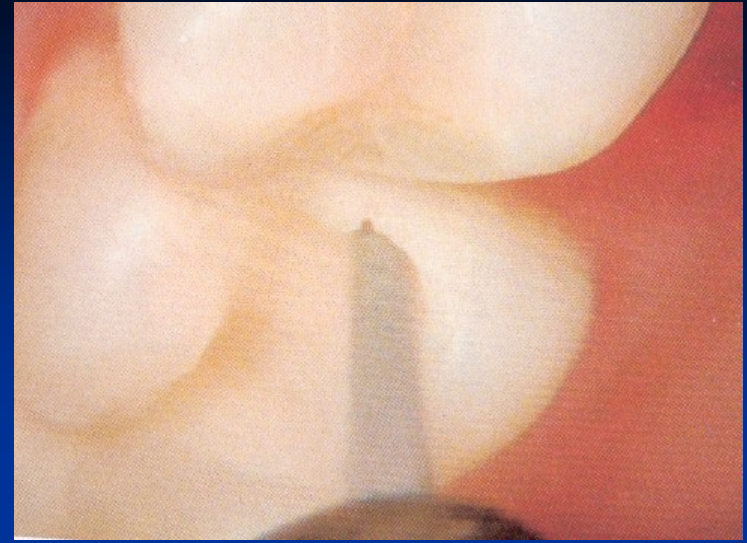


Non metallic adhesive dentures

- Inlays, onlays
- Inlay bridges
- FRC posts



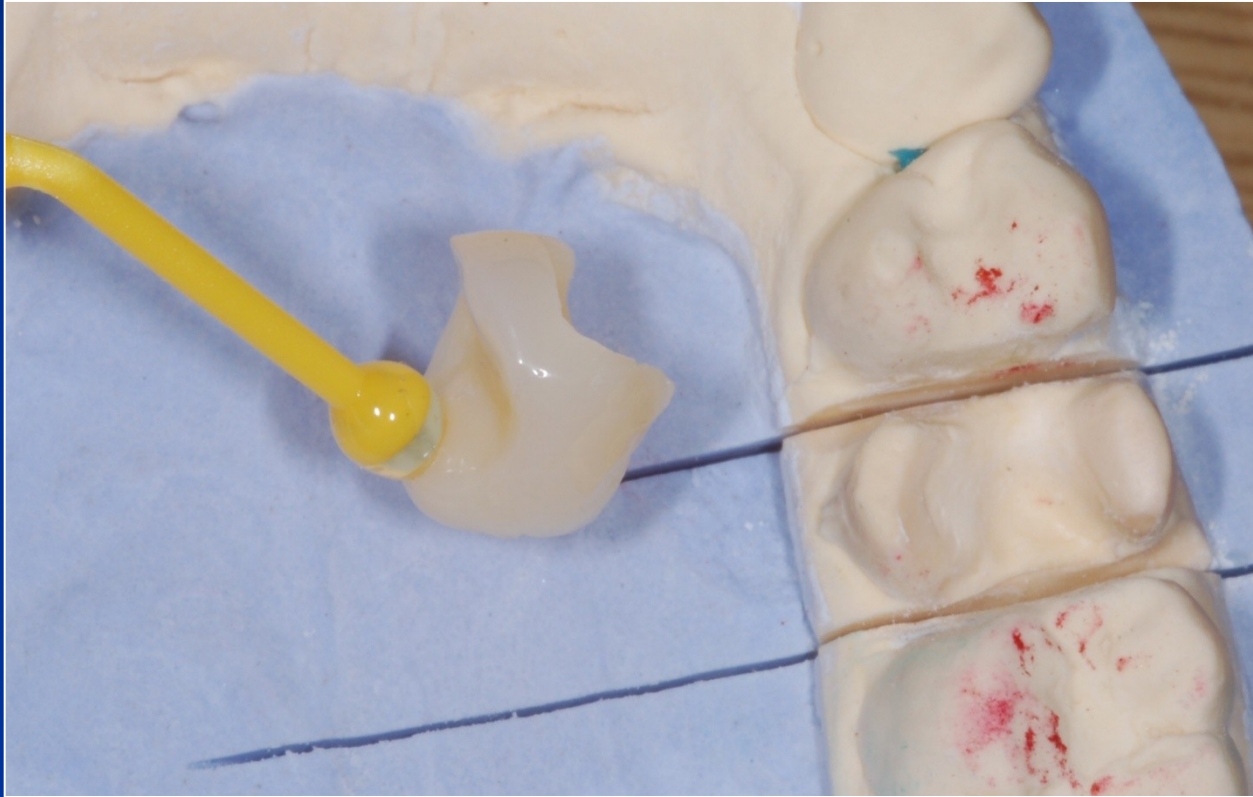








+



One tooth replacement

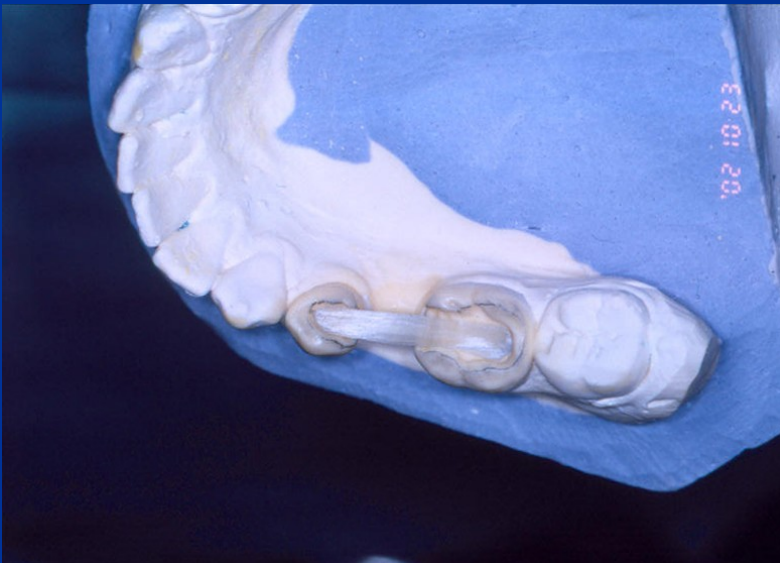


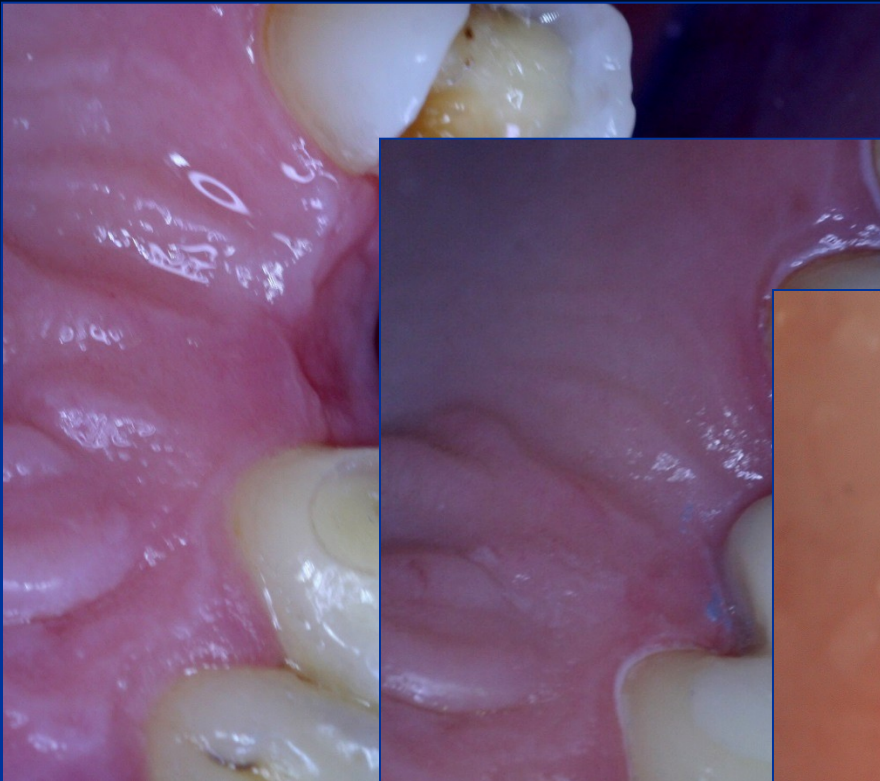
One tooth replacement – adhesive bridge



Adhesive bridges





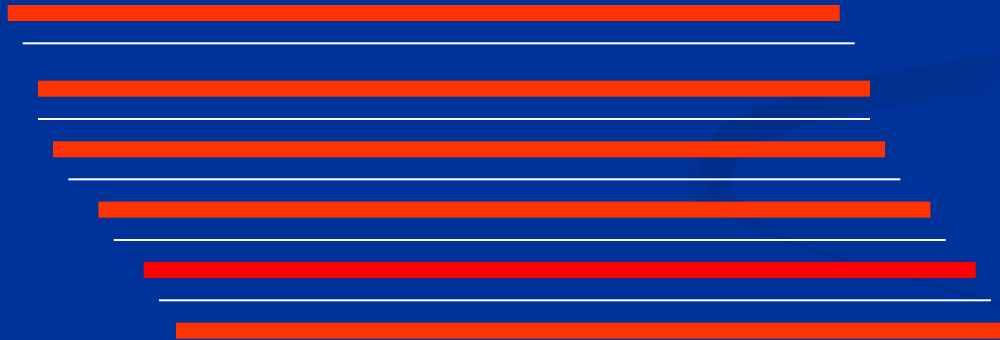


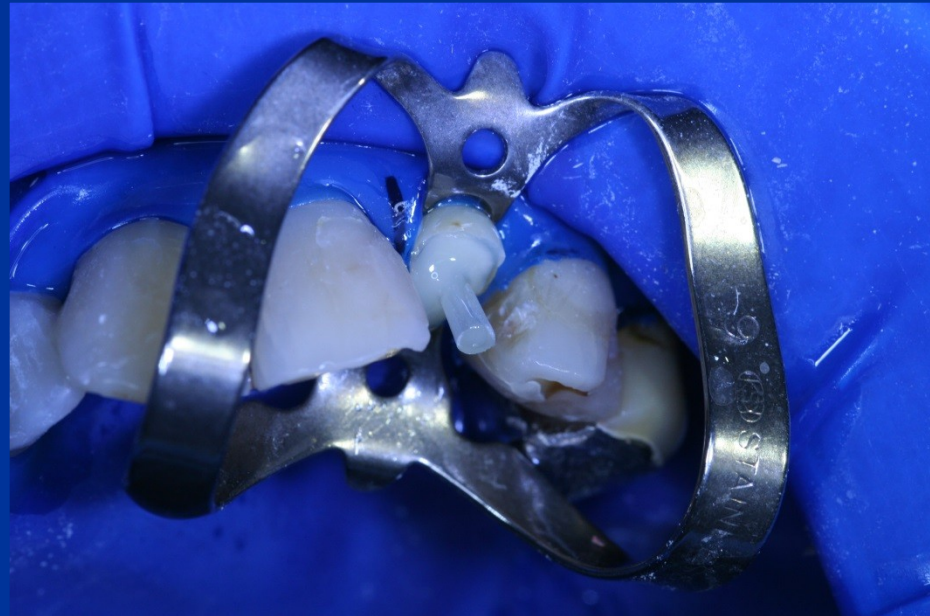





FRC

Filler - fibers





FRC x PFC composites



Surface friction between
matrix and filler –
reinforcement
Anisotropy



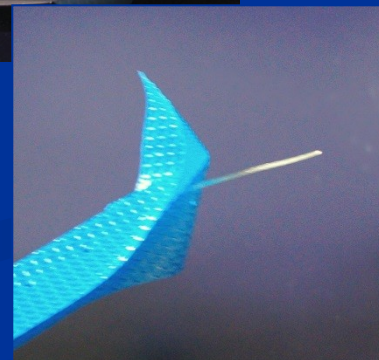
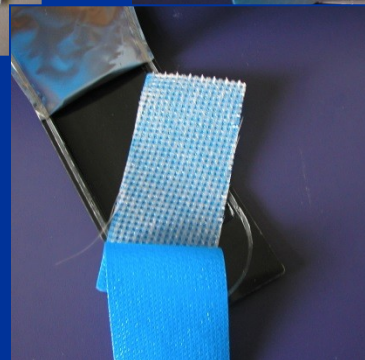
Surface friction is minima
Isotropy



Always combination



Products





One tooth replacement

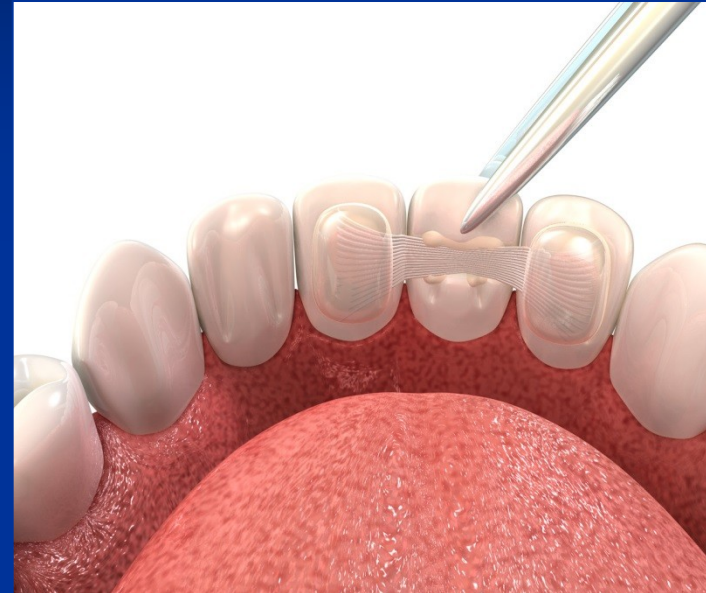
Location of FRC

Preparation

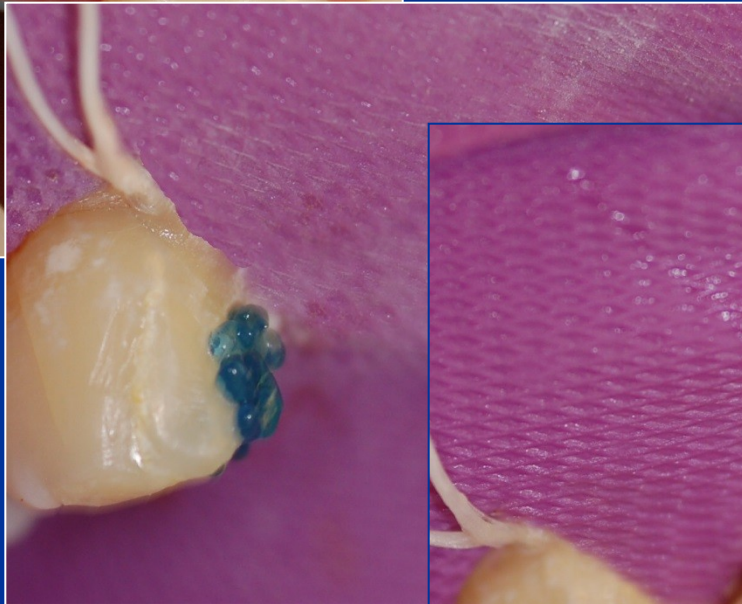
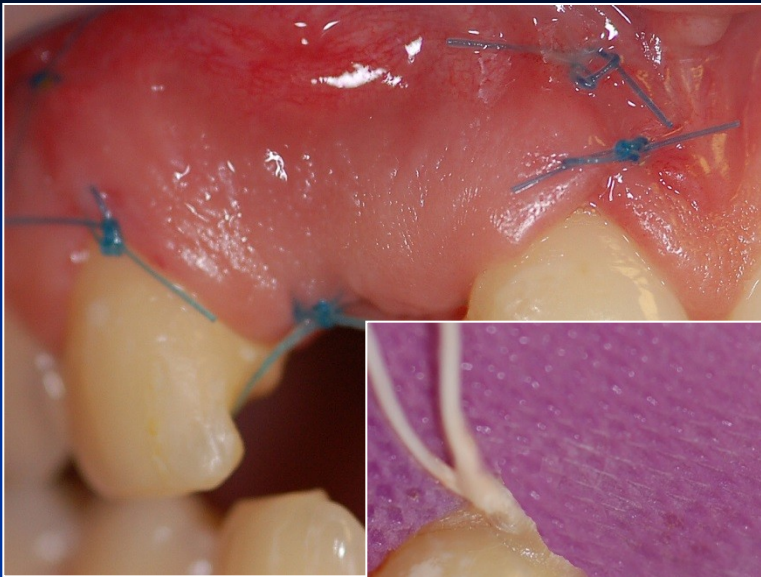
Adhesion

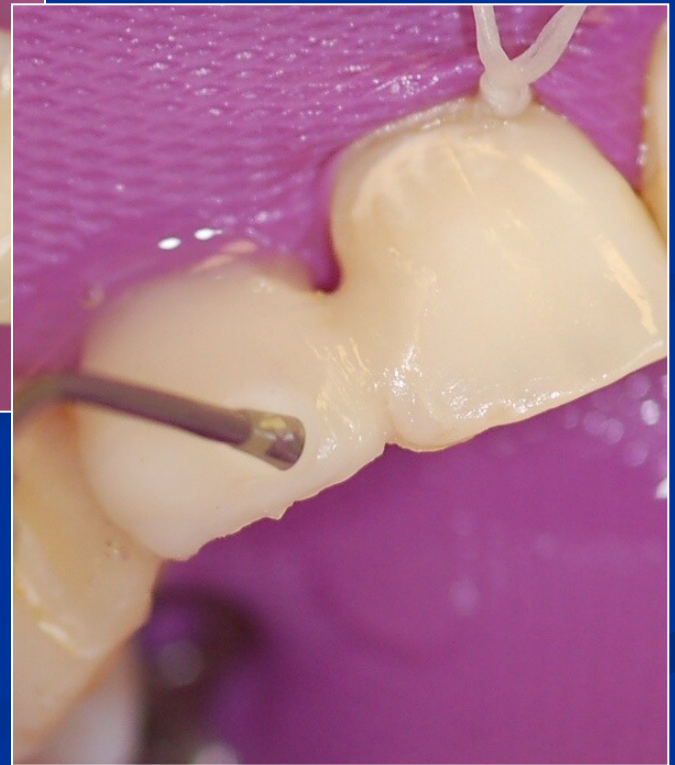
Placement of the arteficial tooth

PFC composite on the top









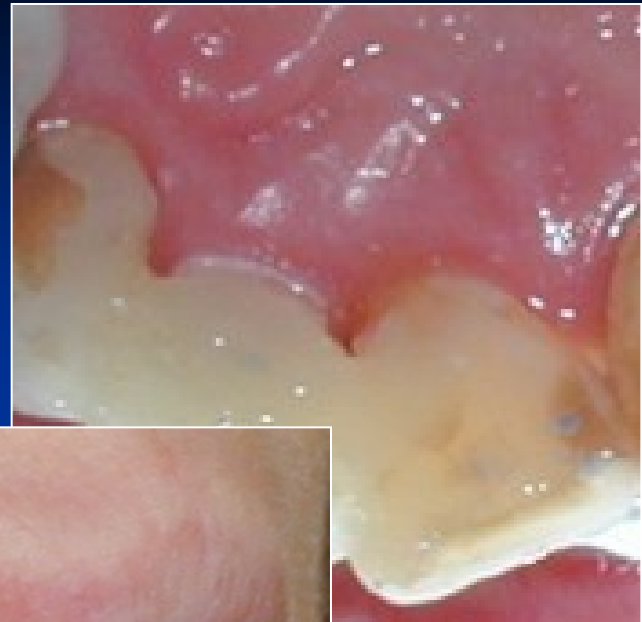




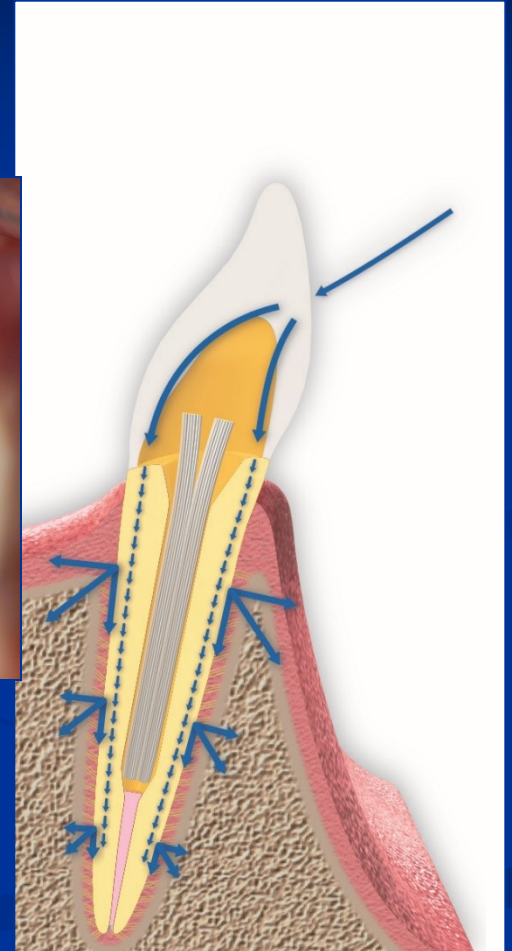
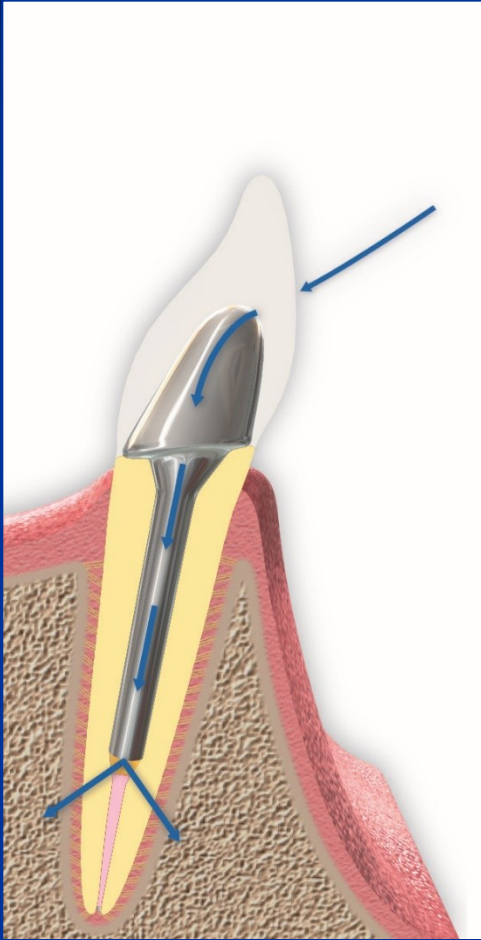


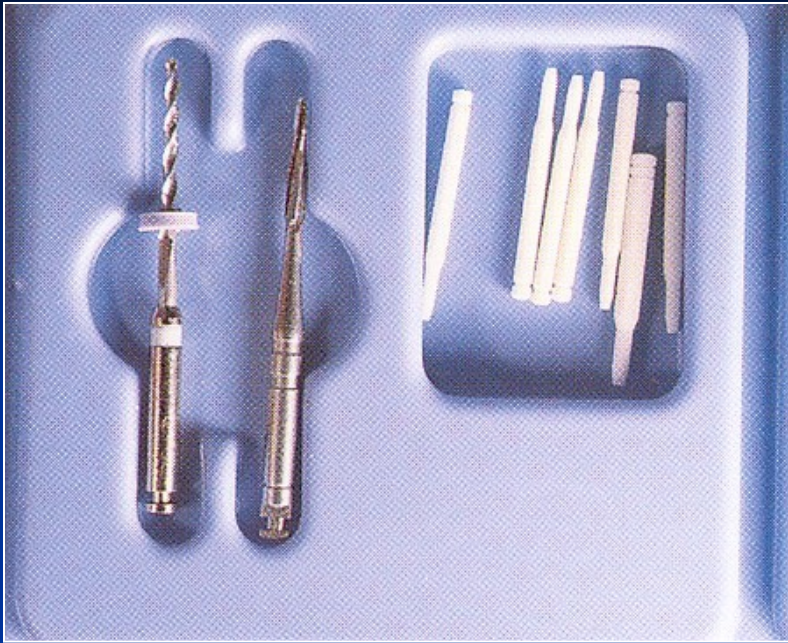




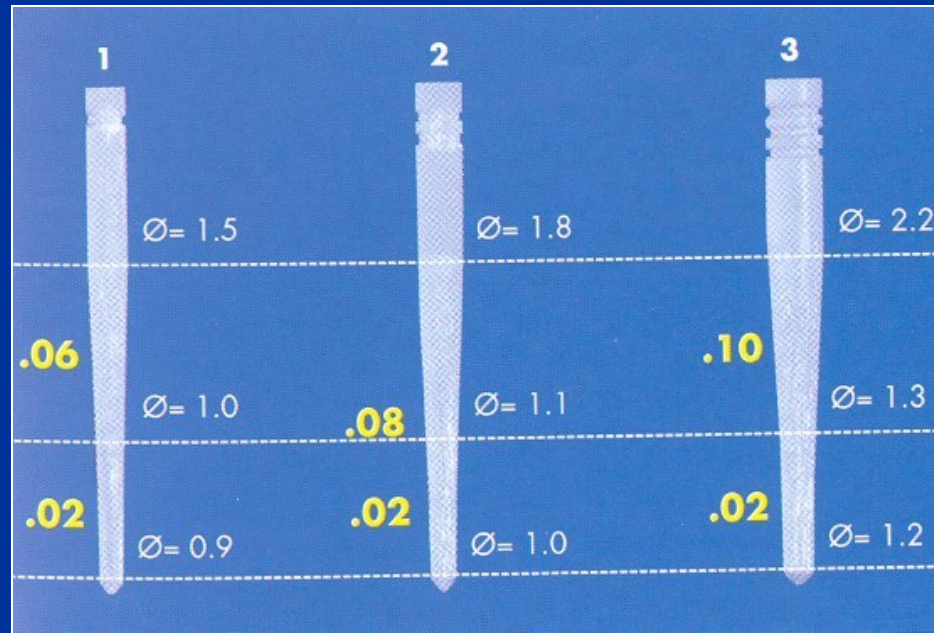


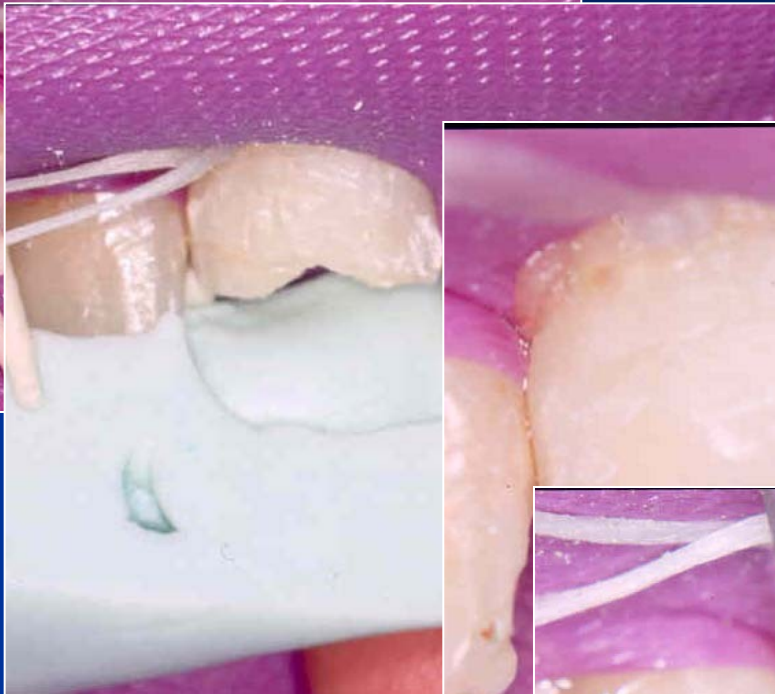
FRC posts – postendo treatment





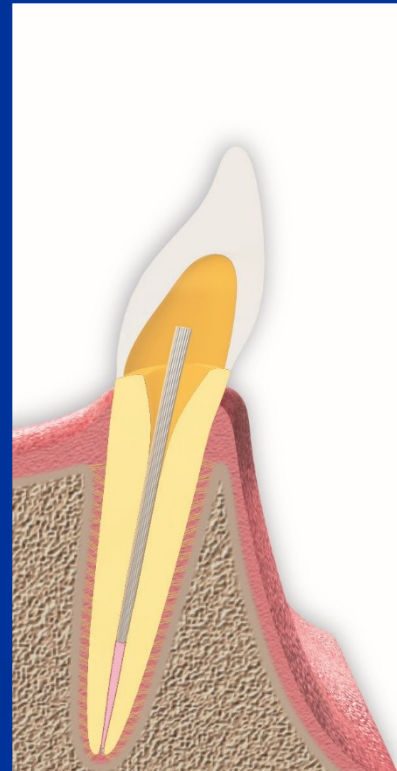
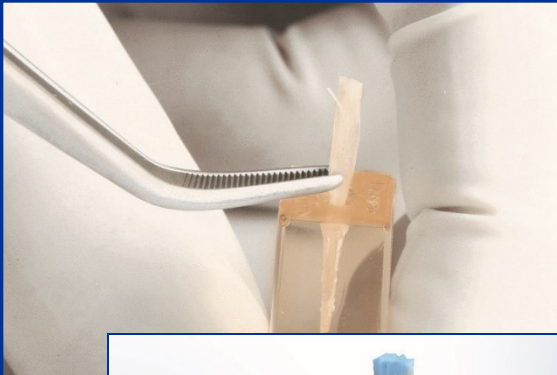
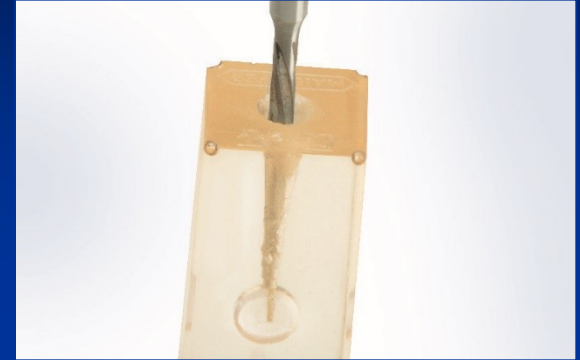
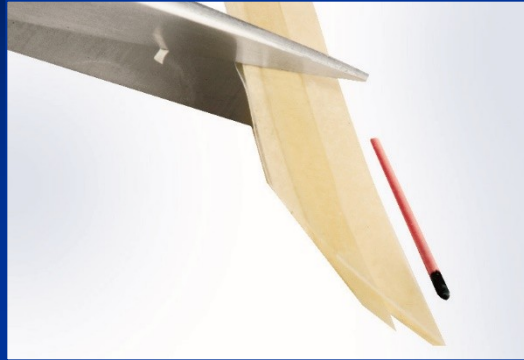
White Light

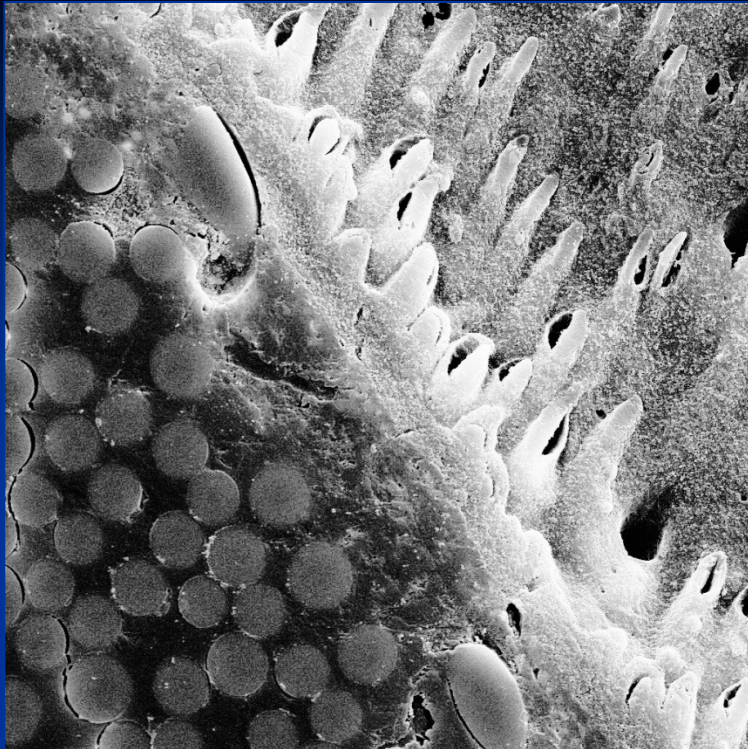




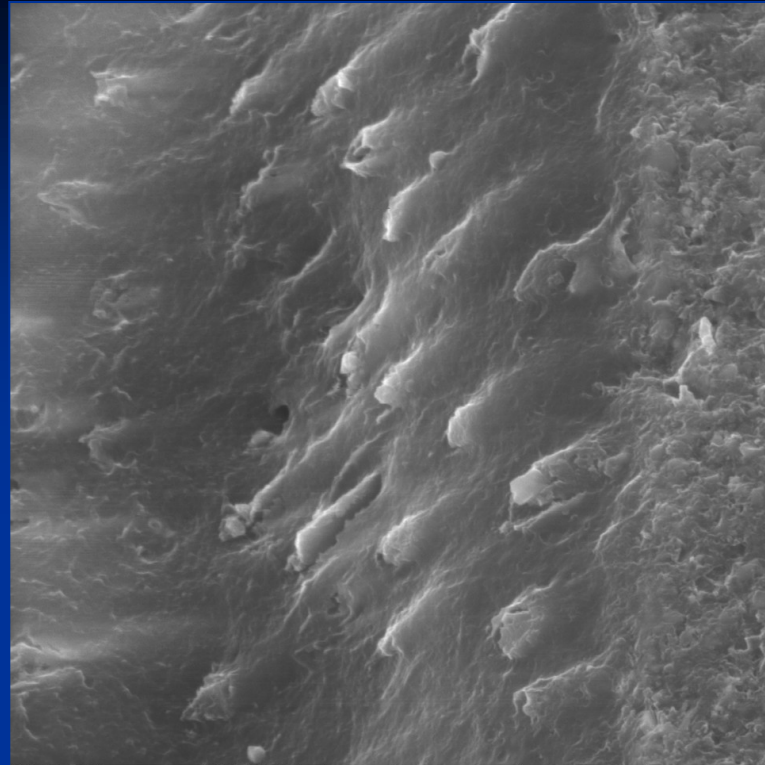


Individually made FRC posts





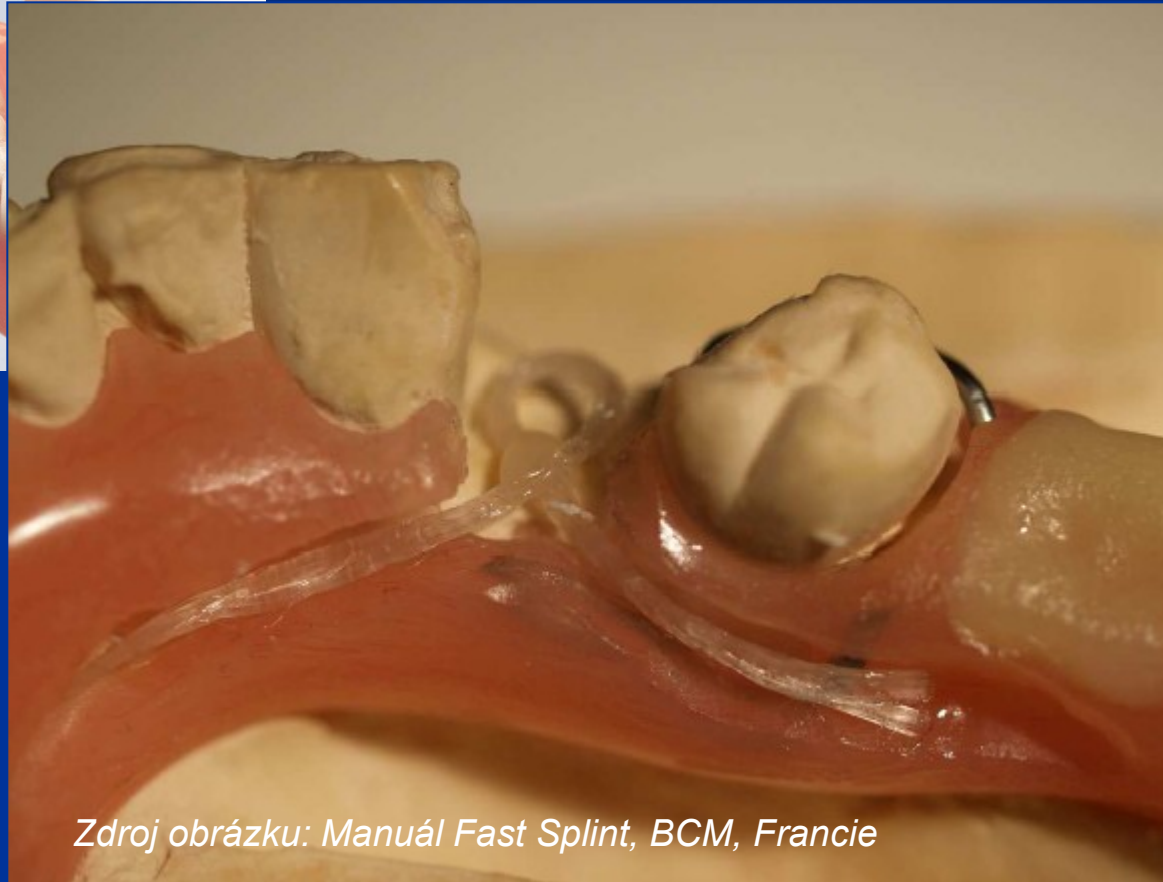
SEM MAG: 4.00 kx DET: SE Detector 20 um Vega ©Tescan
HV: 20.0 kV DATE: 06/19/07 Digital Microscopy Imaging
VAC: HiVac Device: TS5136XM



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



Repair od dentures



Repair od dentures



Reinforcement

