Adhesive technique

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Adhesion

the anorganic tooth material changes to resin

connection of two materials on one interlocking surface

has two phases:

①demineralisation

②hybridisation

Conditioning – enamel

microtag:

where the nucleus of the enamel prism dissolves

macrotag:

where the perifery of the enamel prism dissolves

Conditioning – dentin

More difficult:

less hydroxy apatite;

inhomogeneous structure.

Smear layer

Starts up during preparation;

0,5~5 µm organic and anorganic components

(dentin chips + microorganisms);

plugs in the tubuli

2~5 µm deep →

obstruct the attachements.

The „predestination” of smear layer

etch&rinse – removes

self-etch – modifies

Adhesives

(primer + bond)

Basic is similar to the composite matrix (BisGMA);

hydrophobic;

close the clear dentin surface, so protect from

- ~ microleakage;
- ~ postoperative sensitivity;
- ~ hydrodynamical stimuli;

reduce polymerisation shrinkage.

Sorts of primers

water based } „dry bonding”

ethanol based } „wet bonding”

acetone based

In superfitial dentin layers: less tubuli, smaller cross section

intertubular areas are more important;

☑ in deeper layers: more tubuli, bigger cross section

→ intratubular, additional bonding forces.

Classifications of adhesives

❶ Generations I~VII

according to marketing appearances;

❷ Van Meerbeck's subdivison

due to clinical usings:

total~etch = etch & rinse systems;

self~etch bondings;

resin modified glass ionomer bonding systems.

①

Etch & rinse systems

with the removal of smear layer

3 steps

etchant

primer

bond

2 steps

etchant

primer + bond

② Self-etching systems with modifying the smear layer

There's no previous conditioning;

their monomers have acidic groups;

put directly on the smear layer

→ built-in the hybrid layer.

2 steps　　1 step

③ Resin modified glass ionomer adhesives

Filling materials with more resin;

less postoperative sensitivity (since there's no acid etching + also stress breaking);

with polypropylene acid preconditioning even better adhesion.

③ Resin modified glass ionomer adhesives

10~20% polypropylene acid

remove smear layer → microporosity in the dentin: micromechanical attachment;
chemical bonding with calcium ions

} „mild self etch”

Use

① 10~20% polypropylene acid etching for 10s
→ rinsing, drying

② as an underliner