

Surface Conditioning Protocol for the Chairside Repair of Polymeric Denture Teeth

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IAAD WORKING INSTRUCTIONS

Question: What is the best chairside surface conditioning protocol for the repair of polymeric denture teeth?

Answer: Ideally, the denture tooth should be bonded to the denture base using the acrylic processing technique.⁷ After removing the glaze from the ridge laps of the denture teeth, monomer is applied to the ridge laps.⁵ The denture tooth base is conditioned with the organic nonpolymerizable solvents dichloromethane (ie, methylene chloride) or ethyl acetate that swell the surface and permit acrylic resin to diffuse.⁶ Then the base is packed with acrylic resin dough using the manufacturers' recommended liquid:powder ratio and heat polymerization cycle.⁵ The flask should be allowed to cool slowly and rest before deflasking. All traces of wax or mold seal from the ridge laps of the denture teeth should then be removed. However, chairside repair may occasionally be needed,² where the following conditioning sequence can be recommended:

CAVE: Recently, multimode adhesive systems have become available as metal primers, but all multimode adhesives as well as conventional metal primers require initial air-abrasion procedures. Thus, physicochemical conditioning protocols are still crucial for the repair of debonded denture teeth.

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Do	Why?
Coat the buccal part of the debonded denture tooth and buccal flange of the denture using glycerine gel.	Accidental deposition of particles during conditioning of the denture tooth base by air abrasion may damage the denture base or denture tooth polish.
Air abrade the denture tooth base and denture base to which it will be bonded using a chairside air-abrasion device, preferably with alumina particles coated with silica or silica only (particle size range: 30 to 50 µm; blasting pressure: 2.5 bar) for approximately 20 s from a distance of approximately 10 mm in circling motion, rotating the nozzle, until the denture tooth base/denture base surface turns matte. ³ Rinse under copious water and dry thoroughly.	Air abrasion of the denture tooth base and denture base cleans contaminants from and roughens the surface. The alumina particles present a more amorphous pattern than silica-coated alumina particles or silica particles, which then react with the subsequent metal primer. ¹ The nozzle distance of approx. 10 mm allows the particles to abrade the surface over a larger area. If the nozzle is not rotated in circling motions, the surface is not evenly roughened. ⁴ Rinsing removes the particles from the denture tooth base/denture base and increases wettability of the metal primer.
Apply one layer of metal primer based on 4-methacryloyloxyethyl trimellitate anhydride (4-META) and 10-methacryloyloxydecyl dihydrogen phosphate (10-MDP) on the Co-Cr pins or diatoric undercuts present on the denture tooth base and the corresponding denture base surface, wait for its reaction. ⁸	Metal primer makes covalent bonds between the conditioned denture tooth base and the resin luting composite. ⁸
Apply adhesive resin preferably based on 4-META and 10-MDP on both the denture tooth base and the corresponding denture base. ⁸ Air thin the adhesive resin and photopolymerize for 20 s.	Application of adhesive resin increases the wettability of the resin luting composite.
Apply resin luting composite based on 4-META and 10-MDP, photopolymerize. ⁸ Finally, finish and polish the repaired area.	Metal primer, adhesive and resin cement will increase co-polymerization between the interfaces.

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