

Prosthodontics

Influence of two conservative preparation designs on the internal fit of CAD/CAM overlays

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Aim: To assess the internal fit of CAD/CAM lithium disilicate overlays luted on maxillary molars that were prepared with a 90° rounded shoulder or with a minimally invasive chamfer.

Methods: Sixteen intact maxillary third molars were selected from a pool of freshly extracted teeth and randomly divided into two experimental groups of eight elements each. All the teeth were subjected to 1 mm occlusal reduction. The two groups received different axial reduction and marginal preparation. In one group, the margin was prepared with a rounded 90° shoulder and positioned on enamel after 1 mm axial reduction. In the other group, an oblique marginal chamfer was created, thinning the preparation along the external perimeter of the tooth (<1 mm). After preparation, all the exposed dentine surfaces were treated with a self-etch adhesive system (Clearfil SE Bond 2), following the principles of the immediate dentine sealing. The prepared teeth were scanned to obtain lithium disilicate overlays (IPS e.max CAD) with the Cerec 3 CAD/CAM system. The intaglio surfaces of the restorations and the prepared surfaces of the teeth were conditioned for adhesive cementation by following a standard protocol (Clearfil SE Bond 2 with selective enamel etching). Afterwards, the overlays were luted with Variolink II cement. The restored teeth were subjected to thermomechanical aging with a chewing machine (5±3–50±3°C, 80s; 50 N, 259200 cycles, 1Hz). All the specimens were sectioned twice in bucco-

lingual direction, thus creating six surfaces of interest for the internal thickness analysis. The sections were photographed at the stereomicroscope and the cement thickness was measured at 20 equidistant points along the adhesive interface with ImageJ freeware software (120 measurements per specimen). The average value of the readings for each specimen was calculated and regarded as statistical unit. The difference in cement thickness between groups was statistically assessed with an independent sample t-test ($p < 0.05$).

Results: The mean value of cement thickness was $0.135 \pm 0.036 \mu\text{m}$ and $0.142 \pm 0.036 \mu\text{m}$ in the rounded shoulder and chamfer group, respectively. The statistical analysis did not point out significant differences between the groups ($p = 0.668$).

Conclusion: Both the considered preparation designs allowed for acceptable precision with regard to internal fit. The minimally invasive chamfer performed similarly to the less conservative shoulder preparation; its application in the clinical setting seems promising but should be supported by clinical studies.

Conventional methods of retention for facial epithesis

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Aim: A successful facial prosthesis depends on several factors, of which retention is a primary component. Prostheses can be retained by anatomic-mechanical, adhesive, or biomechanical means. The selection of a facial-prosthetic adhesive can be perplexing because little information is available to the consumer. It is for this reason then that we aim to discuss here the properties and behaviour of adhesives in the retention of prostheses.