0404

Marginal and Internal Adaptation of Recent Bulk-Filling Restorative Strategies

A. Sahli[1], L. Daeniker[2], I. Krejci[3], T. Bortolotto[2]
[1]Fixed Prostodontics and Biomaterials, University, Geneva, Switzerland, [2]Cariology, University, Geneva, Switzerland, [3]Cariology, University, Geneva, Switzerland

Objectives The aim of this study was to compare both external and internal adaptation of restorative systems applied in class II cavities by using simplified protocols, before and after fatigue.
Methods Forty-eight human teeth were divided in six groups (n=8). Dentinal fluid simulation was performed before restoring the class II cavities (depths: 3mm proximal and 1.5mm occlusal) : Group 1 - Universal adhesive (Clearfil Universal Bond Quick) and nanohybrid flowable composite (Clearfil Majesty ES Super Low Flow), Group 2 - Universal adhesive (Clearfil Universal Bond Quick) and nanohybrid composite (Clearfil Majesty ES standard), Group 3 - Bulk fill self-adhesive composite (Surefil One), Group 4 – Alkasite dual cured material (Cention Forte), Group 5 - Universal adhesive (Adhese Universal) and nanohybrid composite resin (Tetric Powerfill) and Group Control (CT) - glass ionomer (Equia Forte). Marginal adaptations were observed with scanning electron microscopy (SEM) and compared before and after a fatigue test consisting of repeated thermal (500 cycles) and mechanical cycles (200’000 cycles). Samples were then cut mesio-distally and internal adaptation was evaluated using SEM again. ANOVA and Fisher’s LSD post-hoc test (α=0.05) were used to compare the differences among groups.
Results Regarding the external adaptation after loading (Fig. 1), Cention Forte and Equia Forte HT were statistically equivalent and presented the highest percentages of continuous margins (58 and 53%, respectively), followed by Clearfil Majesty ES Standard (32%) and Tetric Powerfill (27%), with Surefil One (8%) and Clearfil Majesty ES Flow Super Low (7%) showing the worst results. In terms of internal adaptation (Fig. 2), Cention Forte (Fig.3, 85%) and Clearfil Majesty ES Standard (74%) resulted in significantly higher values, while Tetric powerfill (56%) and Equia Forte HT (44%) showed significantly lower results, followed by Clearfil Majesty ES Flow Super Low (33%) and eventually Surefil One (17%).
Conclusions For the restoration of class II cavities, this in vitro study showed comparable marginal adaptation for glass inomer Equia Forte and alkasite dual cured Cention Forte. Regarding the internal adaptation, this latest material presented the highest percentages of continuous margins.