

**Fracture resistance and marginal adaptation of conventionally cemented fiber-reinforced composite three-unit FPDs.**

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**PURPOSE:** This in vitro study investigated the marginal adaptation and fracture resistance of three-unit fiber-reinforced composite fixed partial dentures (FPD) luted with two different resin-modified glass-ionomers. **MATERIALS AND METHODS:** A total of 48 FPDs were constructed from the glass fiber-reinforced materials FibreKor/Sculpture, Vectris/Targis, or the polyethylene fiber system BelleGlass/Connect (n = 16 for each brand). The reconstructions were conventionally luted on human molars using resin-modified ProTecCEM or Fuji Plus and then exposed to thermocycling and mechanical loading. **RESULTS:** During thermocycling and mechanical loading, cementation failed in seven of eight FibreKor or BelleGlass FPDs and in one of eight Vectris/Targis FPDs luted with ProTecCEM. All Fuji Plus-cemented FPDs showed no signs of damage or cementation loss. The fracture resistance of the remaining FPDs was as follows: Vectris/Targis-ProTecCem 1,361 +/- 360 N, Vectis/Targis-Fuji Plus 923 +/- 207 N, BelleGlass/Connect 940 +/- 155 N, and FibreKor/Sculpture 524 +/- 202 N. The marginal adaptation of the cement-tooth interface deteriorated by 13% to 21% for all reconstructions after stress application, which was not statistically significant. The crown-cement interface had a significantly greater marginal gap only with the combination of FibreKor and Fuji Plus after stress simulation (change 33%). **CONCLUSION:** Conventional cementation of fiber-reinforced FPDs can lead to cementation loss. The marginal adaptation and fracture resistance deteriorated in comparison to adhesively cemented reconstructions.

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