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Calcium phosphates as fillers for methacrylate-based sealer.

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OBJECTIVES: The aim of this study was to evaluate the mineral deposition, push-out bond strength, radiopacity, the degree of conversion, film thickness, flow, calcium ion release, and pH of experimental endodontic sealers containing hydroxyapatite (HAp), alpha-ticalcium phosphate (α -TCP), or octacalcium phosphate (OCP) particles.

MATERIALS AND METHODS: Fifty single straight root human premolars were instrumented and divided into five groups (n = 10). Experimental endodontic sealers were formulated by 70 wt% urethane dimethacrylate (UDMA), 15 wt% of glycerol-1,3-dimethacrylate (GDMA), 15 wt% of ethoxylated bisphenol A glycol dimethacrylate (BISEMA), camphorquinone (CQ), N,N-dihydroxyethyl-para-toluidine (DHEPT), and benzoyl-peroxide. 10 wt% of each HAp, α -TCP, or OCP were added to the resin and its properties were assessed. **RESULTS:** After 7 days, the degree of conversion ranged from 44.69% (GOCP) to 50.74% (Gcontrol) and no statistical difference were observed (p < 0.05). GAHplus showed the highest push-out bond strength 4.91 (\pm 2.38) MPa at 28 days of analysis (p < 0.05). Film thickness and pH were not statistically different (p > 0.05). Statically lower values of flow were found for GHAp, GOCP, and G α -TCP (p < 0.05). Calcium deposition values were higher

for GHAp at 28 days. CONCLUSIONS: Bond strength, degree of conversion, and film thickness of endodontic sealers with phosphates showed similar results compared with AHplus, but displayed higher amounts of Ca²⁺ release.

CLINICAL RELEVANCE: Phosphate fillers improve the performance of endodontic sealers after 28 days of simulated body fluid.

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