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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 ( $\alpha$ -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,  $\alpha$ -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 $\alpha$ -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 Ca<sup>2+</sup> release.

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

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