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Observation of calcium phosphate powder mixed with an adhesive monomer experimentally developed for direct pulp capping and as a bonding agent

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Abstract:
In this study, morphological shape, elemental distribution and elution properties of Ca, P, Mg in four types of calcium phosphate powder were investigated using SEM, EPMA and ICP-AES. Calcium phosphate powder: OHAp, DCPD, β-TCP and OCP were observed in the white powder form and in the photopolymerized adhesive monomer they scattered like dispersed fillers in resin composite. In elemental analysis, CaKα showed a relatively high concentration in relation to PKα. In elution analysis, each calcium phosphate showed different elution of Ca and P. But Mg was almost equal to the detection limit of ICP-AES. Namely it was suggested that reparative dentin formation was effectively promoted under the following conditions: a calcification promoting effect by direct contact of the calcium phosphate powder, an ionic effect of Ca and P eluted from the powder located in the vicinity of the exposed pulp and environmental pH change of the surface in exposed pulp.

Key words:
Adhesive monomer, Calcium phosphate powder, SEM, EPMA, ICP-AES

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