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Experimental Secondary Caries Around Two Composite Resins in Human Teeth.
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Recently a new kind of composite resin (Ariston pHc, Vivadent) has been introduced into the dental market. Such material is capable to release F, Ca and OH ions when the oral environment becomes acid preventing the appearance of secondary caries. The aim of this in vitro study was to analyze the capability of Ariston pHc to inhibit in vitro secondary caries. On ten fresh extracted human molars were cut, on their mesial and distal surfaces, two rectangular cavities (4 X 3 mm) 1.5 mm deep. Each cavity was situated in the middle of the enamel-cementum junction. On each tooth a cavity was used as control and filled with a conventional composite resin containing fluorides (Tetric Ceram, shade 102, Vivadent), the other cavity was filled with Ariston pHc. All the fillings were performed according to manufacturer instructions. The teeth were then coated with a commercial nail varnish except for windows which included the restorations and 1.5 mm rim of sound tooth structure surrounding the restorations. The teeth were then submerged in an acid water solution (1.0 M lactic acid, 1% of thimol, with sodium acetate buffer, pH 4.5) at 37°C for 6 days. The specimens were successively included in epoxy resin before cutting longitudinally through the restorations with a diamond saw into sections 100 µm thick. The sections were examined by polarized light microscopy. The enamel lesion depths (ELD) and the dentin lesion depths (DLD) were calculated from measurements of the maximum depth of a visible lesion from the free surface. Caries-like lesions were found in bought groups. They showed the following mean values: Tetric Ceram ELD = 11 µm ± 3,4 SD; DLD 14 µm ± 2,3 SD; Ariston pHc ELD = 9 µm ± 1,5 SD, DLD = 14 µm ± 4 SD. A qualitative assessment of the lesions was effected. In particular, on enamel (E) and on dentin (D), the presence (+ 1) or absence (0) of a zone of inhibition or of a wall lesion (- 1) adjacent to the cavities was analyzed. The findings have shown the following data: Tetric Ceram E = 0,8 ± 0,63 SD; D = 0 ± 0,0 SD; Ariston pHc E = 0,7 ± 0,48 SD; D = - 0,1 ± 0,57 SD. The results shown not significant differences as tested by ANOVA. We can conclude that limitedly to our condition of analysis Ariston pHc and Tetric Ceram have the same capability to inhibit secondary caries in vitro.

A SEM Analysis of a New Kind of Megafiller.**M. ANDREASI BASSI*, A. ESPOSITO, C. CITO and G. GORACCI**
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In this study we propose the use of a new kind of inert megafiller using the glass balls normally employed for transmitting the heat in the devices for the fast sterilization of metallic instruments. Such balls can be introduced into the bulk of the restoration allowed to reduce the amount of composite necessary for filling the cavity and consequently the polymerization shrinkage. A previous research showed that the glass balls are principally composed of amorphous SiO₂ (74 %) with other elements in traces like: Al, Ca, Mg, Zn, Cl. The present analysis has been performed at the aim to investigate the ultrastructural surface characteristic of this megafiller before and after acid etching. Ten glass balls (Pulpdent Co.) were divided in to two group of five each; one group was etched for 1 min. with 40 % HF (Merk) and then washed with water for 1min.; the other group was used as control. The glass balls were then sputter coated (Edwards Spattering 150 S) with 200 Å thick platinum and observed using a scanning electron microscope (Cambridge Instruments 150A) at 5 kV acceleration. The control group showed an amorphous superficial structure, while the acid etched group showed the presence of a crystalline precipitate which is likely constituted by SiF₄ but probably also other elements, above mentioned, have a role in the genesis of such crystalline precipitates. Any way at higher magnification this precipitate does not seem strongly bonded to the underlying surface. We can conclude that 40 % HF is not the ideal etchant for the glass balls. Probably such megafiller do not require an acid etch treatment to improve its roughness, it can be therefore simply silanized to obtain a valid bond with the composite resinous matrix.