

Remineralization effects of xylitol on demineralized enamel.

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We morphologically determined the effects of xylitol on the remineralization of artificially demineralized enamel. The samples were demineralized and then immersed in a remineralizing solution with or without 20% xylitol at 37 degrees C for 2 weeks. Samples were observed using contact microradiography, a multipurpose image processor (MIP) and a high-resolution electron microscope (HRTEM). Contact microradiography indicated that remineralization occurred in the surface and deep layers of samples immersed in a non-xylitol solution. Samples immersed in a xylitol solution demonstrated less mineralization in the outer 10 microm of the outermost surface layers, but more mineralization in the middle and deep layers, than was observed in the non-xylitol samples. The MIP evaluation indicated that remineralization was more prominent in layers at depths of 50-60 microm in the xylitol samples than in the non-xylitol samples. Observation of the xylitol samples by HRTEM revealed crystals of various sizes and irregular shapes with unclear crystal angles in the outermost surface layers. In the middle layers, they had thickened and angles of crystals are clear. **These results indicate that xylitol can induce remineralization of deeper layers of demineralized enamel by facilitating Ca²⁺ movement and accessibility.**

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