

Title:	Measuring Initial Enamel Erosion with Quantitative Light-Induced Fluorescence and Optical Coherence Tomography: An in vitro Validation Study.
Type:	Article
Source (ISSN):	Caries Research (0008-6568)
Status:	A paid open access option is available for this journal.
Author:	Chew H. P., Zakian C. M., Pretty I. A., Ellwood R. P.
Volume (Issue):	48(3)
DOI:	10.1159/000354411
Abstract:	<p>Background: Measurement of initial enamel erosion is currently limited to in vitro methods. Optical coherence tomography (OCT) and quantitative light-induced fluorescence (QLF) have been used clinically to study advanced erosion. Little is known about their potential on initial enamel erosion.</p> <p>Objectives: To evaluate the sensitivity of QLF and OCT in detecting initial dental erosion in vitro.</p> <p>Methods: 12 human incisors were embedded in resin except for a window on the buccal surface. Bonding agent was applied to half of the window, creating an exposed and non-exposed area. Baseline measurements were taken with QLF, OCT and surface microhardness. Samples were immersed in orange juice for 60 min and measurements taken stepwise every 10 min. QLF was used to compare the loss of fluorescence between the two areas. The OCT system, OCS1300SS (Thorlabs Ltd.), was used to record the intensity of backscattered light of both areas. Multiple linear regression</p>

	<p>and paired t test were used to compare the change of the outcome measures. Results: All 3 instruments demonstrated significant dose responses with the erosive challenge interval ($p < 0.05$) and a detection threshold of 10 min from baseline. Thereafter, surface microhardness demonstrated significant changes after every 10 min of erosion, QLF at 4 erosive intervals (20, 40, 50 and 60 min) while OCT at only 2 (50 and 60 min). Conclusion: It can be concluded that OCT and QLF were able to detect demineralization after 10 min of erosive challenge and could be used to monitor the progression of demineralization of initial enamel erosion in vitro. © 2014 S. Karger AG, Basel.</p>
Keyword:	Diagnostics; Initial enamel erosion; Measurement; Optical coherence tomography; Quantitative light-induced fluorescence
Related URL:	<ul style="list-style-type: none">• http://www.karger.com/Article/FullText/354411• http://www.ncbi.nlm.nih.gov/pubmed/24481141• http://www.octnews.org/articles/5153452/measuring-initial-enamel-erosion-with-quantitative/• http://www.mdlinx.com/dentistry/news-article.cfm/5077912/dental-enamel