Detection of remineralization of early caries with The Canary System®

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Objectives

The in vivo study evaluated the ability of: 1) The Canary System® and The Canary Lab to detect natural early caries on smooth surfaces; 2) Curodont™ Repair (Credentis AG, Windisch, Switzerland) to induce in-depth remineralization of enamel structure in natural early caries; and 3) The Canary System and Canary Lab to detect and monitor remineralization of teeth treated with Curodont™ Repair.

Materials & Methods

Fifteen extracted human teeth with natural early caries lesions on smooth surfaces were selected. Teeth were randomly assigned to three experimental groups (5 teeth/group): (1) Treatment Group (teeth treated with CR), (2) Control Group (teeth were left untreated), and (3) Placebo Group (teeth were treated with CR placebo).

Prior to treatment, sound and carious sites on one smooth surface of each tooth were selected and scanned with CS (baseline). A total of 102 sound and 84 carious sites were scanned using CS with three repeat measurements taken per site. A region 5x6mm x 6mm on each smooth surface of interest was scanned using CL (baseline). A total of 305 sound sites and 936 carious sites were scanned using CL.

CR was applied to Treatment Group and CR placebo was applied to Placebo Group. All examination sites were re-scanned with CS and CL after CR application (Day 0).

Canary Lab images of tooth were comparable throughout treatment period. (B) CN of sound sites are outlined by green circles, and carious sites are outlined by black circles. (C) PLM image of examination site B at Day 50. (D) Canary Lab images of tooth, Remineralization of the treated tooth structures were reflected in the Canary Lab images by the fact that colors representing higher Canary Numbers were replaced with colors representing lower Canary Numbers.

Results

Average Canary Numbers of sound sites of all three sample groups ≤24 throughout the treatment period (up to Day 14 for placebo group).

Conclusions

This study demonstrated the potential of The Canary System and Canary Lab to detect natural early carious lesions on smooth surfaces and monitor remineralization of caries lesion treated with Curodont Repair.

Placebo group study is still under progress but has shown no remineralisation up to day 14.