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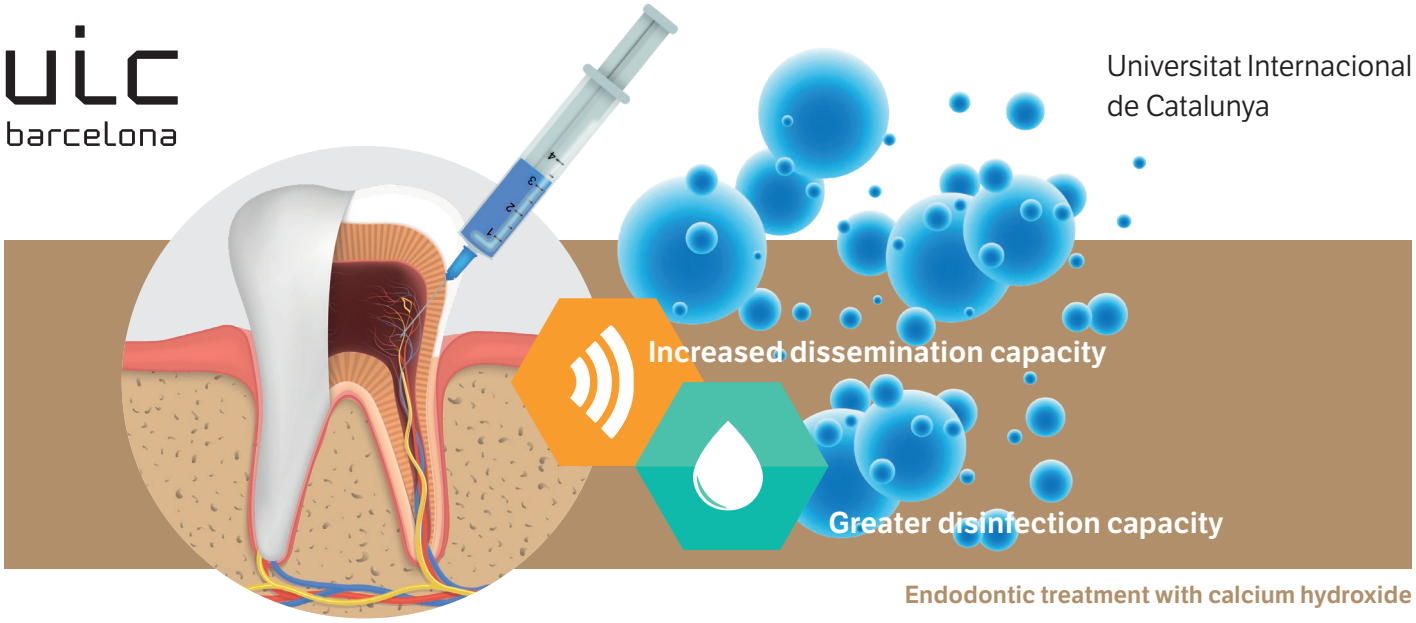

Endodontic treatment with calcium hydroxide

Intracanal Endo Treatment

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Goal

The group is looking for a license agreement, but other collaborations may be considered.

Patent

International Patent Application and European Patent Granted. Priority date: 11-6-2020

Reference

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Contact

rvazquez@fbg.ub.edu
gmasbaga@uic.es

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Introduction

Endodontics is the part of dentistry that deals with disorders of the dental pulp and their consequences on the periradicular tissues. The present finding solves one of the main causes of failure in other treatments: the elimination of residual bacteria inside the root canal in the final phase of endodontics. Treatment success lies in the use of nanoparticles, which can dissolve the polymeric extracellular matrix, resulting in better penetration into the dentinal tubules and greater antibacterial capacity.

Description

A research group, with broad experience in Endodontic Treatment, has generated a medication that increases its penetration into dentinal tubules for the elimination of biofilms with PLGA-based particles (biodegradable and biocompatible polymer formed by lactic and glycolic acid) with CaOH (calcium hydroxide) encapsulation. The formulation is based on nanoparticle technology with a size of 180-200 nm. The intracanal application will be carried out through the pulp chamber during the endodontic treatment. At the end of this first phase, the medication will be released inside the canals and fill them. The medication will be left for a 15–day period to eliminate the intra-radicular biofilms thereby allowing the medication to come into contact with the internal walls of the dentin where the bacteria are lodged. The last phase consists of the removing the medication and complete the definitive root canal obturation.

Advantatges

— Greater penetration into the dentin (500 microns inside the dentinal tubules)
— Controlled discharge of the active ingredient
— Greater bacterial disinfection
— Leaves no residus
— Biodegradable
— Prolonged and sustained release
— Stable pH levels
— pH levels sustained over time
— Buffer effect avoided
— Injection in liquid form that transforms into gel when it reaches body temperature

Current stage of development

— Different tests being performed to evaluate antibacterial efficacy, including efficacy against the E. faecalis bacteria
— Optimization of the thermo-gel to achieve an optimal transition temperature between the liquid and gel phase and improve the application of the technology inside the root canal
— Long-term stability and release tests
— Evaluation of penetration and activity of the technology compared to current solutions using confocal microscopy
— Verification of the presence of nanoparticles by scanning electron microscopy on the dentin surface using an ex-vivo model
— Industrial pre-scaling tests
— Preparation for European regulations
— Sterilization and freeze-dry testing