Clinical advantages of QSP operation mode in Er:YAG Fotona LightWalker

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Came one year ago, QSP mode gave to laser operative dentistry possibilities to make even sharper and cleaner cuts in hard dental tissues and use of low energy levels without loss of speed and effectivity . Splitting each pulse into several shorter ones makes possible to avoid some unwanted effects when drilling with the Er:YAG laser like absorption and scattering of the laser beam in the debris cloud, thus making the cut more precise. Shorter pulses also mean less thermal effect for the tissues.

After brief introduction to physical basics of the Quantum Square Pulse operation mode , in the presentation are shown in-vitro results of testing the permeability of the fillings borders filled with nanohybrid composite and 7th generation bonding system from Voco.

Three groups , 30 freshly extracted bovine teeth each, are prepared with different settings in QSP mode and filled with Grandioso V.C. A5 /Futurabond M .Two control groups of 30 teeth are prepared in MSP mode with the same laser and with high speed turbine(Kavo Gentlesilence 8000,Meisinger diamamond burs),also filled with same materials. 15 teeth of each group are immersed in Methyleneblau and 15 are exposed to bacterial contamination with Lactobacillus. The aim of the study is to find how the preparation mode influences permeability of the bonded surfaces in critical conditions.

At last, clinical benefits are shown and explained with comments on pictures from real cases from every-day's practice.

Er:YAG laser implantar bone site preparation: a clinical reality?

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AIM OF THE STUDY: The investigation of the possibility to achive the preparation of the implantar bone site by using the Er:YAG laser.

BACKGROUND: The affinity of 2940nm wavelength of Er:YAG laser for water and hydroxy apatite, may permits the selective vaporization of the mineral component of the cortical bone, in order to reduce the mechanical trauma due to the insertion of the fixture into the under preparated bone site.

MATERIALS AND METHODS: Several clinical reports are presented. We prefer to use the mirror handpiece to obtain a bigger Fluence on the target tissue. Normally the parameters employed on the bone are 250mJ, 20Hz, 5W, 100µsec pulse duration, air\water ratio 8\4, Th.Fluence = 125J\cm^2. The underpreparation is obtained getting closer to the bottom of the site during preparation of the bone and the visual control is continuosly performed. Due to the absence of a physical reference and the diffusion of the ray on the site walls, is mandatory to control with a implantar probe the diameter and the deepness of the preparation. The placement of the fixture into the bone tissue is easier, because of the demineralization of the cortical component that has a behavior close to the midollar bone.

RESULTS: It is possible to prepare a implantar bone site by using just the Er:YAG laser without the common rotary instruments. The clinical difficulties are linked to the handability of the operator and the impossibility, nowadays, to standardize the procedure.

CONCLUSIONS: In our honest opinion it is possible to create a under prepared bone site to locate the implant for a early occlusal loading just using the Er:YAG laser insted the rotary instruments. In the future will be necessary the introduction into the market of devices aimed to standardize the bone site preparation, such as scanners and so on. It is also importat to go deeper into the study of the bone remodelling processes during the healing period.