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ERRATUM

Erratum to: surface alterations of zirconia and titanium substrates after Er, Cr:YSGG irradiation

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The original version of this manuscript, unfortunately, did not contain the Materials and Methods section. The said missing section is given below.

Materials and methods

Experimental design

The experimental units consisted of 20 disks (n=5 per group). Ten disks of yttrium-stabilized tetragonal zirconia poly crystal (Y-TZP) (AS Technology Titanium FIX, São José dos Campos, Brazil) with 5 mm diameter and 3 mm high were standardized from CAD-CAM blocks. Ten disks with 5 mm diameter and 4 mm thickness of titanium sandblasted acid-etched surface (AS Technology Titanium FIX) were used. The disks with sandblasted acid-etched surface were blasted with 100 μm Al_3O_2 particles. After the sandblast, the specimens were ultrasonically cleaned with an alkaline solution, washed in distilled water and pickled with HNO_3. This industrial process creates the surface referred to as sandblasted acid-etched (SLA).

Specimen treatment and laser system

The Y-TZP zirconia disks were randomized into two groups of laser irradiation: Y-TZP_G1 = control (no laser treatment); Y-TZP_G2 = Y-TZP irradiated with Er, Cr:YSGG laser (1.5 W; air-water cooling proportion 80/25 %). The titanium SLA disks were randomized into two groups of laser irradiation: TI_G1 = Titanium SLA control (no laser treatment); TI_G2 = titanium SLA irradiated with Er, Cr:YSGG laser (1.5 W; air-water cooling proportion 80/25 %). The control groups thus had surfaces left ‘as is’ after their production by CAD-CAM or SLA treatment.

The control groups did not receive any laser treatment (Y-TZP_G1 and TI_G1). Er, Cr:YSGG laser (λ=2780 nm; Water lase, Bio lase Technologies Inc, Irvine, CA, USA) was used on each Y-TZP zirconia disk (Y-TZP_G2) and titanium disk (TI_G2) in focused mode with a G4 tip (ø 378 μm) positioned at 1 mm (90°) from the disk surface (focused mode). An endodontic K-file fixed to the laser hand piece ensured the distance standardization. Repetition rate was fixed on 20 Hz. The air-water cooling proportion was fixed on 80/25 % to Y-TZP_G2 and TI_G2. One single trained operator uniformly irradiated by hand the disk surface in a grid pattern for 30 s. The hand pice was positioned perpendicularly to the disk surface. Each sample was irradiated once in each direction, moving the hand piece slowly horizontally and vertically, to promote homogeneous irradiation and cover the entire sample

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area. The energy density used for the laser irradiation of each laser group was 67 J/cm^2.

Confocal white light microscope

The surface topography of the disks was investigated using confocal microscope (Leica Scan DCM 3D, Leica Microsystems Ltd, Switzerland) with objective magnification 50×, numeral aperture 0.9, optical resolution (X/Y) 0.16 μm, FOV (μm) is 254.64 × 190.90. The vertical resolution was <3 nm with sub-micron lateral resolution in confocal mode according to manufacturer. The control groups (TI_G1 and Y-TZP_G1) were used as references. Profiler software (Leica DCM 3D Dual Core, Leica Microsystems Ltd) calculated the surface roughness. Sa and Ra were recorded. Sa measure was performed at 254.64 × 190.90 μm^2 and Ra length of 254.64 μm (768 × 576 pixels).

Statistical analysis

The factor under study was laser: no laser treatment and laser treatment. Values were statistically analyzed by *t*-test at the 95 % confidence level (α=0.05) using a software package (SANEST, EPAMIG, MG, Brazil). Power was calculated using the G power 3.1.2 software package (Heine, Universität Dusseldorf, Germany) (p=0.93). The mean of Sa and Ra roughness values and standard deviation were calculated from five profiles for each group.