
Title

Biological Response of Soft Tissues to Three Abutment Materials Titanium, Zirconia, and Lithium Disilicate. An In Vitro Comparative Study

Abstract

Aim The implant-abutment/emergence connection, and therefore the relationship with soft and hard tissues, is an important factor that determines the long-term success of dental implants in clinical practice. The purpose of this study was to compare the biological response of murine fibroblasts L929 when exposed to three materials: Titanium, Zirconia, and Lithium Disilicate (DSL), used as implant abutment materials.

Materials and methods Samples of titanium, Zirconia, and DSL were obtained. Prior to material characterization by X-ray fluorescence and Raman spectroscopy, the samples were sterilized in a steam autoclave at a temperature of 121 °C for 30 minutes. Murine fibroblasts L929 were seeded for cell viability measurement. The metabolic activity was measured at 24 hours and 48 hours of culture using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. The results were analyzed using SPSS v. 20.0.

Results At 24 hours, an increase in viability was observed, although there was no significant difference among the three studied materials ($p=0.564$). At 48 hours vs. 24 hours, DSL showed the highest degree of cell viability ($p=0.0003$), followed by Zirconia ($p=0.027$), and then Titanium ($p=0.056$). The cell viability values for titanium, Zirconia, and DSL were 116%, 132%, and 172%, respectively. There was no evidence of cytotoxicity.

Conclusion Cell viability in response to the studied implant abutment materials could anticipate the biological response, the stability of the different materials in relation to soft tissues, and their connection. Other factors such as biomechanics and bacterial adhesion should be considered when choosing a material. © ARIESDUE March.

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