ZIRCONIA PROSTHESIS - A PROMISING SOLUTION FOR OSSICULAR CHAIN RECONSTRUCTION

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INTRODUCTION

Oxide ceramic materials used for partial and total ossicular replacement prostheses have been preferred for the reconstruction of the ossicular chain because of their favourable properties. The ceramic prostheses of zirconium oxide, aluminum oxide, hydroxyapatite and glass ceramic present with individual actual biological surfaces.

AIM OF THE STUDY

The analysis of the fracture resistance and fracture mode of single implant-zirconium coping combination using zirconium abutment and of the stress distribution pattern using three-dimensional finite elements analysis shows that the fracture resistances for zirconium abutment is 514,05 N. Implant-abutment-ZrO₂ coping combination has the potential to withstand physiological occlusal forces in the anterior region. Three-dimensional finite elements analysis results of this combination are compatible with the results of fracture resistance (K. Firidalnigla et al., 2012).

CHARACTERISTICS OF ZIRCONIUM OXIDE

Zirconium oxide represents a. It is characterized by excellent biocompatibility, high stability and low toxicity reliably proved by experimental and clinical studies. The warranted high precision represents another important advantage of the zirconium prosthesis.

Ceramic implants of aluminum oxide, hydroxyapatite, glass ceramic and zirconium oxide have individual actual biological surfaces. Using radial immunodiffusion, the adsorption of albumin, glycoproteins, plasminogen, fibrinogen, IgA, IgG and IgM shows characteristic rates of adsorption to the respective ceramic surfaces in correlating to the actual surface confirmed with fluorescent antibodies and is the basis for the recording of cellular reactions after implantation (A. Schadel et al., 1993).

Recently, there is an increased use of zirconium-containing compounds in middle-ear ossicular chain reconstruction. Experimental and clinical studies support the general consensus that these compounds are bioincompatible and exhibit low toxicity. Reports on possible zirconium-associated adverse reactions are rare and, in general, have not rigorously established a cause-and-effect relationship (D. B. Lee et al., 2010).

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REFERENCES


3. Rosalbino F, Macciò D, Giannoni P, Quarto R, Saccone A. Study of the in vitro corrosion behavior and biocompatibility of Zr-2.5Nb crystalline alloy and characterize it as a promising biomaterial for surgical implants (F. Rosalbino et al., 2011).
