

COMPARATIVE RESONANCE FREQUENCY ANALYSIS OF THE PRIMARY STABILITY AT DIFFERENT DENTAL IMPLANT DESIGNS

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Primary implant stability appears to be a prerequisite for successful osseointegration of dental implants. Different factors may contribute to initial implant stability, and these include implant design, surgical technique and bone quality.

The aim of this study was to determine the effect of different macro design on primary stability, and the evaluation of primary stability relative to the percentage contact surface of the implant and bone.

The research was conducted in vitro, with pig ribs as analogue of human bone (cortical thickness 2 mm, non-self tapping implants Nobel Biocare Replace 3.5x10 mm and self-tapping implants Bredent 3.5x10 mm. The primary stability was measured with Ostell mentor instrument and Student's t-test was used for statistical data processing.

The average value of primary stability after three measurements with 5mm contact of bone and non-self tapping for Nobel Biocare is 30 ISQ. In self-tapping Bredent implants, the ISQ values were 42 ISQ. When the contact with the bone was on 10 mm, the following average values of primary stability were recorded: Nobel Biocare 70 ISQ, and Bredent 72 ISQ. Chi-square test ($p < 0.05$) showed that there is a statistically significant difference in the values of primary stability in implants with different designs.

Implant design plays an important role in achieving adequate primary stability. In this study, there were statistically significant higher values of primary stability recorded in self-tapping compared to non-self-tapping implants at the 5mm depth, thus recommending it for immediate placement.

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