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”

Effect of Implant Design in Immediate Loading. A Randomized, Controlled, Split-Mouth, Prospective Clinical Trial”*

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SUMMARY.

Objectives

The aim of this study was to evaluate the effect of two different designs, tapered vs cylindrical, on the primary stability of implants placed with an immediate loading protocol in edentulous mandibles to support fixed prostheses within occlusal contacts during the first 48 h.

Material and methods

Tapered and cylindrical implants were placed in a split-mouth study using the same implant protocol in ten patients with edentulous jaws. A total of 20 tapered implants (SEVEN[®], MIS Implants Technologies) (test group) and 20 cylindrical implants (control group) were placed. All implants were loaded immediately with provisional fixed prostheses during the healing period before the final restoration. The implants were evaluated at the implant placement by analyzing the insertion torque values (ITVs) and the resonance frequency analysis (RFA) and after the healing period of three months, the success of those implants and the marginal bone loss were evaluated.

Results

Two cylindrical implants were mobile within the same patient and no tapered implants failed, resulting in implant survival rates of 90% and 100%, respectively after three months. The ITVs were statistically significantly different ($P = 0.0210$) for the tapered implants than for the cylindrical implants. However, no statistically significant differences in RFA values were found ($P = 0.6063$) when comparing the implant designs and the primary stability measured with implant stability quotient (ISQ) values. The control group resulted in a mean bone loss after three months of 0.91 mm while the test group resulted 0.42 mm.

Conclusions

The tapered implant achieved greater primary stability values measured with ITVs and less marginal bone loss than the cylindrical implants.

Descriptive statistic for marginal bone level changes at mesial and distal perimplant bone. Values are expressed as millimeters with mean standard deviation. Mbl (mesial bone loss), Dbl (distal bone loss)

Variable	Tapered mean + SD	Cylindrical mean + SD	Median	Pvalue
Mbl 1 month	0.22±0.14	0.43±0.14	0.38±0.12	0.012*
Dbl 1 month	0.27±0.16	0.49±0.21	0.39±0.26	0.034*
Mbl 3 months	0.39±0.12	0.86±0.13	0.56±0.39	0.047*
Dbl 3 months	0.45±0.17	0.97±0.17	0.78±0.18	0.041*

A level of significance of 95% (* $P < 0.05$).

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