

Advanced Dentistry 2020: Comparative strain gauge analysis of morse taper, internal hexagon, external hexagon and influence of straight and offset implant placement - Prof. Renato S. Nishioka-Brazil

Prof. Renato S. Nishioka

Abstract

The present study was designed to analyse the strain distribution caused by varying the implant-abutment joint (morse taper, internal and external hexagon) and implant alignment. The hypothesis of this study suggests that different connections promote different microstrain, and the offset arrangement of 3 implants may be preferred over the straight-line placement.

To simulate clinical conditions a real-life arrangement of three external, internal hexagon and morse taper implants labeled mesially, distally as A, B, and C (AS Technology titaniumfix, São José dos Campos, São Paulo, Brasil) were arranged in the middle of six measurement models 70 x 40 x 30mm³ polyurethane rectangular blocks. Four Strain gauges (SG) were bonded on the surface of polyurethane block and it was designated SG1 placed mesially adjacent to implant A, SG2 and SG3 were placed mesially and distally adjacent to the implant B and SG4 was placed distally adjacent to the implant C. The thirty superstructure's occlusal screws were tightened onto the Microunit abutments (AS Technology titaniumfix, São José dos Campos, São Paulo, Brasil) with a torque of 10 N cm using the manufacture's manual torque-controlling device.

There were statistically significant difference in prosthetic connection ($P\text{-value} = .0074 < 0.5$). There were not statistically significant differences in placement configuration ($P\text{-value} = .7812 > 0.5$).

The results showed fundamental differences between both conditions. There were not evidences that the advantage of offset placement in reducing the strain around implant. The results revealed the internal hexagon and morse taper joint did not reduce the micro strain around the implant. The use of offset placement of implants is a concept that does not make reason mechanically and clinically. The differences between the clinical results as being straight and offset in regard to prosthetic connection have been shown to be difficult to clearly define.

Biography

Renato S. Nishioka is Chair of Implantology and Fixed Partial Prosthesis of Department of Dental Materials and Prosthodontics. He has published more than 20 papers in dental journals

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