Periodontal Width and Structure of Natural Dentition Opposing Implant-borne Bridgework

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Objectives: Dental implant research interest is nearly always about achieving successful osseointegration and optimal peri-implant soft tissue conditions. By comparison little is known about the effects of implant-supported superstructures on the opposing natural dentition. The periodontal membrane (PM) functions as a dynamic attachment apparatus and responds to occlusal forces by widening/narrowing its width and alterations in collagen fibre density/orientation. The aim here is to investigate the influence of implant-borne bridgework on PM structure.

Methods: Test samples consisted of maxillary second premolar-second molar jaw segments from four healthy adult male monkeys (Macaca fascicularis) that had implant-supported 3-unit bridge placement in the second premolar-second molar regions of their mandibles – one side for immediate loading and the other side for delayed loading, in a split mouth design. Control samples also consisted of maxillary second premolar-second molar jaw segments from two monkeys but without fixed prosthesis placement in the opposing mandibles. After 3 months of functional loading, the animals from both test and control samples were sacrificed, and the premolar-molar regions of the maxilla were harvested and processed for histometric analysis. Apical and cervical PM widths were measured using an Image Analyzer.

Results: No pathological changes in PM were observed in both test and control. Collagen fibre density/orientation was normal and inflammation was absent. No significant differences were found in PM width between test and control samples at both cervical and apical sites respectively.

Conclusions: Findings suggest that implant-borne bridgework does not adversely affect the PM of the opposing natural dentition.

Research Poster II

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