On loading protocols and abutment use in implant dentistry

Clinical studies

Avhandlingen baseras på följande delarbeten:


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ABSTRACT

Research questions: The influence of immediate or delayed loading and the use of abutments in implant dentistry with regard to peri-implant tissues and the effect of risk parameters.

Methodology: Fifty partially edentulous patients each received three Bränemark TiUnite™ implants. The patients were randomly assigned to a test group (immediate loading) or a control group (delayed loading). The test patients received a temporary prosthesis within 48h. The prosthesis was attached directly at implant level (IL) or via abutments: a machine-milled surface (AM) or an oxidized surface (AOX, TiUnite™). Clinical examinations and intraoral radiographs were performed during a 5-year period. For a subgroup, crevicular fluid was analyzed with qPCR.

Results: Up to 1-year, six implants were lost. Thereafter, no implants were lost, resulting in 5-year cumulative survival rates of 93.9% and 97.0%, for test and control groups, respectively. After 5 years, significantly lower marginal bone loss (MBL) was found at superstructures connected to AM than at sites with superstructures attached to IL. Soft tissues retracted mostly during the first year and thereafter minor changes were seen. With time, proximal probing pocket depth, plaque and bleeding increased, whereas a minor decrease for bleeding was found between 3 and 5 years. Similar bleeding-on-probing levels were seen at 3 and 5 years for various connections. The prevalence of peri-implantitis was 4.0% and 9.1% at implant and patient level, respectively, after 5 years. Technical complications were scarce after the first year; the most common was porcelain chipping. In a multiple linear regression model, the independent variables – health change, medication for high blood pressure, periodontal disease experience, smoking (≤10 cigarettes per day), and proximal pocket depth – explained about 27% of MBL variations. The gene study demonstrated correlation between some genes and clinical findings, but there is need for more research.

Conclusions: The results demonstrated similar implant survival and marginal bone loss, irrespective of loading protocol. The use of a machined abutment should be preferred regarding marginal bone stability over time. There is still a lack of scientific support for placing superstructures directly on the implant. Factors related to systemic health and medications as well as periodontal disease experience and smoking, are associated with marginal bone loss. Peri-implantitis was found in 9.1% of the patients, indicating the need for supportive maintenance.

Keywords: abutment design; clinical studies; dental implants; dental prosthesis, implant-supported; gene expression; health; immediate implant loading; marginal bone loss; osseointegration; prosthodontics; risk factors; smoking; treatment outcome.

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