On immediate/early loading of implant-supported prostheses in the maxilla

av
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Avhandlingen baseras på följande delarbeten:

I.   **Fischer K & Stenberg T.** Early loading of ITI implants supporting a maxillary full-arch prosthesis: 1-year data of a prospective, randomized study. *Int J Oral Maxillofac Impl 2004;* **19**: 374-381.

II.   **Fischer K & Stenberg T.** Three-year data from a randomized, controlled study of early loading of single-stage dental implants supporting maxillary full-arch prostheses. *Int J Oral Maxillofac Impl 2006;* **21**: 245-252.

III. **Fischer K, Stenberg T, Hedin M and Sennerby L.** Five–year results from a randomized, controlled trial on early and delayed loading of implants supporting full-arch prosthesis in the edentulous maxilla. *Clin Oral Impl Res 2008; In press.*

IV.   **Fischer K, Bäckström M and Sennerby L.** Immediate and early loading of oxidized tapered implants in the partially edentulous maxilla. A one-year prospective clinical, radiographic and resonance frequency analysis study. *Clin Implant Dent Rel Res 2008; In press.*

V.   **Fischer K, Stenberg T, Billström C and Sennerby L.** Influence of marginal bone level on implant stability measurements using resonance frequency analysis (RFA). *In manuscript.*

ABSTRACT

Background: The original treatment protocol for osseointegrated implants prescribed an unloaded healing period of 3 to 6 months before connection of the prosthetic superstructure. During the last years shortened healing time and rapid loading have become more frequently used. Clinical follow-up studies have reported positive clinical outcomes. However, there are few controlled studies of immediate/early loading in the maxilla.

Aims: The aim of this thesis is to test the hypothesis that immediate/early loading of dental implants in the maxilla results in the same clinical outcomes as when using delayed loading.

Material and Methods: *Papers I, II and III* compared the treatment outcome of early and delayed loading of moderately roughened implants (SLA) in 24 patients for support of a fixed bridge in the totally edentulous maxilla after one, three and five years, respectively. The patients were randomly alotted to either early (n=16, test group) or delayed loading (n=8, control group).
Paper IV evaluated the clinical outcomes and development of implant stability with resonance frequency analysis (RFA) of 53 moderately rough implants (oxidized) in 32 patients when subjected to immediate (single tooth, n=16) or early loading (partial bridge, n=16) in their partially edentulous maxilla during one year.
Paper V investigated in the relation between implant stability measurements and marginal bone loss measurements after three and five years of function in the edentulous maxilla in the same 24 patients as in Papers I, II and III.

Results: *Papers I, II and III.* In total, 142 implants were placed and 139 were loaded with full-arch prostheses: 94 in the test group and 45 in the control group. One test and two control implants were lost before loading. Another four failures were observed in the test group at the five-year follow-up giving a survival rate of 94.7 % for the test and 95.7 % for the control group, respectively (ns). The test group showed significantly better sulcus bleeding index and plaque index scores than the control group after one year. At the 3-year follow-up there were no significant differences between the groups. At the 5-year follow-up more test than control patients presented with plaque. A higher proportion of patients as well as implants in the control group had pocket depths > 3 mm. The average bone loss was greater for test than for control implants during five years, 0.8 (SD 1.2) mm vs 0.3 (SD1.1) mm ($p < 0.05$). However, the bone level was situated more coronally for the test implants during the study period ($p<0.05$). Technical complications were mainly resin-related.
Paper IV. One single tooth implant was lost, given an overall survival rate of 98.1 % (93.8 % for single and 100% for partial bridges) after one year. The average bone loss during the period was 1.1 (SD 1.0) mm (1.5 mm (SD 1.0) in single tooth and 0.9 (SD1.0) mm in partial cases). A statistically significant increase of implant stability with, on average, 3.3 (SD 5.0) ISQ units was observed for both single tooth and partial bridge implants.
Paper V. RFA measurements after three and five years correlated with marginal bone levels as measured in intraoral radiographs. RFA measurements registered at three years could not predict implant failures at the five-year follow-up.

Conclusion: It is concluded that immediate /early loading of dental implants in the maxilla results in the same clinical outcomes as for delayed loading.

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