

On Factors Influencing the Outcome of Various Methods Using Endosseous Implants for Reconstruction of the Atrophic Edentulous and Partially Dentate Maxilla

AKADEMISK AVHANDLING

som för avläggande av medicine doktorsexamen vid Göteborgs Universitet kommer att offentligens försvaras i hörsal Arvid Carlsson, Academicum, Medicinaregatan 3, fredagen den 17:e november 2006 kl. 9.00 av

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Avhandlingen baseras på följande delarbeten:

- I. Becktor JP, Isaksson S, Sennerby L. Survival Analysis of Endosseous Implants in Grafted and Nongrafted Edentulous Maxillae.
Int J Oral Maxillofac Implants 2004;19(1):107–115.
- II. Becktor JP, Eckert SE, Isaksson S, Keller EE. The Influence of Mandibular Dentition on Implant failures in Bone-grafted Edentulous Maxillae.
Int J Oral Maxillofac Implants 2002;17(1):69-77.
- III. Becktor JP, Isaksson S, Abrahamsson P, Sennerby L. Evaluation of 31 Zygomatic Implants and 74 Regular Dental Implants Used in 16 Patients for Prosthetic Reconstruction of the Atrophic Maxilla with Cross-Arch Fixed Bridges
Clin Implant Dent Relat Res 2005;7(3):159-65.
- IV. Becktor JP, Isaksson S, Sennerby L. Endosseous Implants and Bone Augmentation in the Partially Dentate Maxilla: An Analysis of 17 Patients with a Follow-Up of 29 to 101 Months.
Int J Oral Maxillofac Implants 2006, Accepted
- V. Becktor JP, Hallström H, Isaksson S, Sennerby L. A prospective clinical and radiographic analysis of 180 implants placed in partially dentate maxilla after maxillary sinus floor augmentation with particulated autogenous bone from the mandibular ramus/corpus.
In manuscript

ABSTRACT

Surgical reconstruction of the severely resorbed edentulous maxilla often requires a combination of bone grafts and dental implants. Different methods have been used during the years where donor site, type of bone graft, healing period, timing of implant placement and implant surface have varied. The overall objective of this research work is to evaluate the clinical outcome of such methods when used on a routine basis at one oral & maxillofacial surgery clinic at a county hospital in Sweden. The purpose is also to evaluate the influence of various factors on implant failure.

In Paper I, one group of grafted patients (n=64) and one group of non-grafted patients (n=118) were retrospectively evaluated and compared with regard to implant and prosthesis survival. The latter patients had received bone grafts from the iliac crest with simultaneous or delayed (6 months) placement of dental implants with a minimally rough surface (machined/turned). More implant losses were seen in grafted than in non-grafted patients after a mean follow-up of 5 to 6 years, 25% versus 16%, respectively. Most of the implants were lost before loading. There was no difference in prosthesis survival rate. A correlation between the bone volume of the residual jaw bone prior to bone grafting and implant failure rate was seen in the anterior maxilla. There was no difference in implant failure rate between one-stage and two-stage bone grafting and implant placement procedures.

The influence of the type of occlusal support on early implant failure in grafted maxillae was evaluated in Paper II. Ninety (90) patients previously treated with bone grafts from the iliac crest and machined/turned implants were included in the retrospective study. The total failure rate was 18%. In comparison, few failures (6.2%) were seen in patients with a removable mandibular denture and the highest failure rate (43.8%) was seen in patients with unilateral occlusal support.

Sixteen patients previously treated with 31 zygomatic implants and 74 regular implants in the anterior maxilla as an alternative to bone grafting of the atrophic maxilla were evaluated in Paper III. All implants had a minimally rough surface. Three (4.1%) regular implants were lost and three (9.7%) zygomatic implants had to be removed due to recurrent sinusitis after a mean follow up period of 4 years. All patients received and maintained a fixed bridge.

Paper IV evaluated 17 patients subjected to maxillary sinus floor augmentation with blocks of bone from the iliac crest and simultaneous or delayed (6 months) placement of 69 machined/turned implants. After a mean follow up period of 4 years, 8.7% of the implants had been lost. All failures occurred prior to loading of the fixed prostheses. More implants were lost in grafted (10.4%) than in non-grafted (4.8%) areas. Less implants were lost when using a two-stage approach than when using a one-stage technique, 6% versus 18%, respectively.

In a prospective study including 61 patients (Paper V), the use of particulated mandibular bone for maxillary sinus floor augmentation and delayed placement of three types of surface modified implants (oxidized, blasted, blasted+acid etched) was evaluated. The majority of patients were treated under local anaesthesia. Two of 180 implants were lost from placement to delivery of the final prosthesis.

It is concluded that more implant failures occur in grafted than in non-grafted edentulous maxillae. The bone volume of the residual anterior crest and the occlusal support depending on the type of mandibular occlusion seems to influence the outcome of grafting procedures in the edentulous maxilla. Delayed placement of dental implants in bone grafts seems preferable, at least in partially dentate patients. The use of surface modified implants and particulated mandibular bone may be one way to further improve the results of sinus grafting procedures. The use of zygomatic implants is a viable alternative to bone grafting in the treatment of the severely resorbed maxilla.

Keywords: clinical studies, dental implants, maxilla, bone grafting, zygomatic implants

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