

Int Poster J Dent Oral Med 2001, Vol 3 No 3, Poster 92

Analysis of implant longevity in four types of alveolar augmentation

Language: English

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Date/Event/Venue:

10. - 12. Mai 2001

9th International Congress on Reconstructive Preprosthetic Surgery
Kiel, Germany

Abstract

Purpose Loss of implants is a clinical problem especially in alveoli that have been edentulous for long periods. The combination of various augmentation procedures, with primary or secondary implantations, will improve survival rate. This study intended to correlate the survival rate with individual patients' parameters.

Methods A total of 194 patients who underwent reconstruction of deficient dental alveolar ridges and insertion of endosseous implants were evaluated retrospectively. In addition, 134 patients, who are in a multi-disciplinary clinical recall system, were examined on a clinical and anamnestic level. The correlations between an individual patient's bone situation, the surgical technique and the implant survival, were evaluated statistically.

Results & Discussion We found an overall implant survival rate of 96,8 % in our patients. The best results were obtained in partially edentulous patients by autologous bone grafts in combination with primary implantation. Total alveolar ridge augmentation resulted in the highest implant loss rates, both with primary and secondary implantations. And these were associated with the occurrence of a Periimplantitis. Lack of preservation of the soft tissue integrity seems to be the main underlying cause for implant loss.

Introduction

Loss of implants is a clinical problem especially in alveoli that have been edentulous for long periods or bone defects caused by a trauma or as a result of a cancer resection. The problem in those cases is a lack of bone in one or even all three dimensions (vertical, horizontal, sagittal).

Due to continuous development in medical knowledge as well as in investigation of new surgical techniques the classical indications for inserting dental implants could be enlarged 2,3,5,7. The combination of various augmentation procedures i. e. sinus lift, total alveolar augmentation, Guided Bone Regeneration (GBR) and local augmentative techniques, with primary or secondary implantation, will improve survival rate 1.

This study intended to correlate the implant survival rate with individual patients' parameters.

Material and Methods

A total of 194 patients who underwent reconstruction of deficient dental alveolar ridges and insertion of endosseous implants were evaluated retrospectively. Out of these 6 patients got in both jaws augmentation, so that there were altogether 200 cases. Moreover, 134 were examined on a clinical and anamnestic level.

Grafts

Transplant donor site was on the one hand autogenous bone from iliac crest bone, chin, retromolar area, implant bed and on the other hand alloplastic material as a non-resorbable barrier membrane and in some cases Hydroxyapatite (HA).

Surgeries

Of the 200 cases, 47 were treated with a total alveolar augmentation and 45 with a sinus lift. The GBR was used in 56 cases and 52 patients were treated with a localized augmentation.

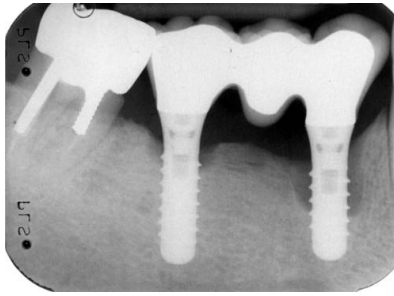
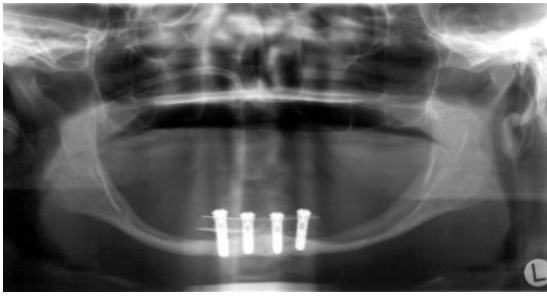


fig. 1: X-ray taken after a total alveolar augmentation

fig. 2: X-ray taken after occurrence of a periimplantitis

Implants

A total of 574 implants were placed in the 194 patients. Implants were inserted either simultaneously (primary) with augmentation or delayed (secondary) after a healing period of 6 months. In the study we used different implant-systems.

Prosthodontics

After allowing an osseointegration time (6 months maxilla, either 3 or 6 months mandibula) to the implants prosthetic rehabilitation begun. Fixed denture (crown, bridge) was integrated each in 29 %. In 27 % a removable bar-worn total prosthesis and in 15 % a partially fixed prosthesis was the therapy.

Clinical parameters

134 patients were clinically examined. Investigations included implant mobility, gingival index, attachment level, inflammation of the mucosa and bone loss. Moreover each patient answered a questionnaire about comfort, function, esthetics and phonation after treatment.

Statistics

The correlation between an individual patient's bone situation, the surgical technique and the implant survival, were evaluated by the Wilcoxon-Test. Additionally, survivalanalysis according to Kaplan-Meier was examined⁴.

Results

We found an overall implant survival rate of 96,8 % in our patients. The best results were obtained in patients treated with a sinus lift or localized augmentation in combination with an autologous bone graft and primary implantation (fig.1-3).

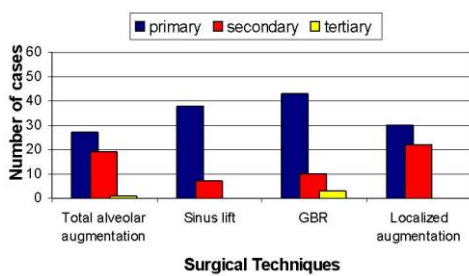


fig. 3: distribution of implant insertion according to surgeries

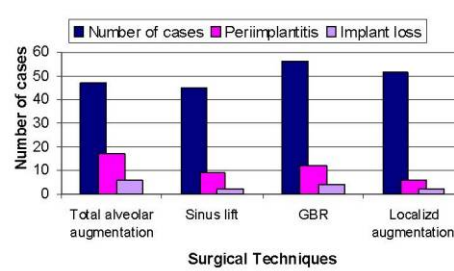


fig. 4: correlation between implant-loss and Periimplantitis

Total alveolar ridge augmentation resulted in the highest implant loss rates, both with primary and secondary implantation. And these were associated with the occurrence of a Periimplantitis (fig.2+4).

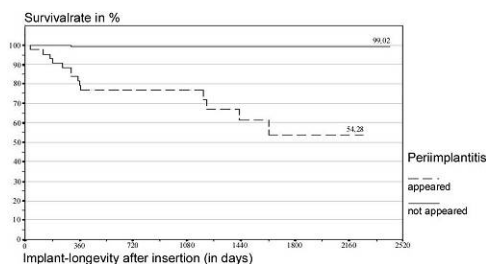
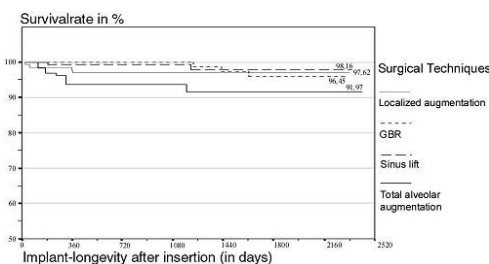


fig. 5: survivalrate according to surgery techniques

fig. 6: survivalrate with occurrence of periimplantitis

Within the clinical examination patients with total alveolar augmentation showed slightly worse results for the gingival index, attachment level and mucosal inflammation. Of these cases treatment was necessary in two cases. The questionnaire illustrated that this group of patients showed most discomfort with the therapy. Thereby most of all it is not the oral situation for dissatisfaction but the transplant donor site, which is in all cases the anterior iliac crest.

Discussion and Conclusions

The present study shows that augmentation in alveolar defects is a predictable procedure for all kinds of rehabilitation. Nevertheless with regards to the survivalrates when ever possible sinus lift should be preferred to total alveolar augmentation when treating an edentulous maxilla. Localized deficiencies should be augmented without a barrier membrane, or at least not like in our study with a non-resorbable membrane, because transplant loss or sequestration occurred mainly in combination with GBR.

The main underlying cause for implant loss seems to be lack of preservation of the soft tissue integrity. But by means of a recall system inflammation can be avoided or treated.

Bibliography

1. Blomqvist JE, Alberius P, Isaksson S: Sinus inlay bone augmentation: Comparison of implant positioning after one- or two-staged procedures J Oral Maxillofac Surg 55: 804-810, 1997
2. Buser D, Hirt HP, Dula K, Berthold H: Membrantechnik/ Oral Implantologie: Gleichzeitige Anwendung von Membranen bei Implantaten mit periimplantären Knochendefekten Schweiz Monatsschr Zahnmed 12: 1491-1501, 1992
3. Fugazzotto PA, Vlassis J: Long-term success of sinus augmentation using various surgical approaches and grafting materials Int J Oral Maxillofac Implants 13: 152-58, 1998
4. Kaplan EL, Meier P: Nonparametric estimation from incomplete observations J Amer statist Assoc 53: 457, 1958
5. Joos U, Kleinheinz J: Reconstruction of severely resorbed (Class VI) jaws: routine or exception? J Cranio Maxillofac Surg 28: 1-4, 2000
6. Neukam FW, Hausmann JE, Schmelzeisen R, Scheller H: Funktionelle und ästhetische Rekonstruktion komplexer Gesichtsdefekte nach Tumorsektion und Traumen In: Schwenger N, Pfeifer G: Fortschritte der Kiefer- und Gesichtschirurgie, Bd 38 Thieme, Stuttgart 135-138, 1993
7. Sommer MCh, Merholz ET: Lokaler traumatischer Kieferdefekt - Versorgung durch autologe Knochenaugmentation mit simultaner Implantation Z Zahnärztl Implantol 13: 44-46, 1997

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