Descriptive analysis of implant and prosthodontic survival rates with fixed implant-supported rehabilitations in the edentulous maxilla

Lambert FE, Weber HP, Susarla SM, Belser UC, Gallucci GO

CRD summary
This review evaluated the survival rates of fixed implant rehabilitations in the edentulous maxilla and concluded that survival rate decreased from one to 15 years and implants with rough surfaces had higher survival rates than machined implants at all time points. As the methods of pooling data may not have been appropriate, the authors' conclusions should be viewed with caution.

Authors' objectives
To evaluate the one- to 15-year survival rates of fixed implant rehabilitations in the edentulous maxilla.

Searching
PubMed and EMBASE were searched for English-language studies from January 1965 to January 2006. Search terms were reported. References were searched.

Study selection
If no randomised controlled trials were available, prospective and retrospective studies studies in which data was obtained from patient recalls with at least one year of follow-up and that reported implant and prosthodontic survival rates were eligible for inclusion, as were studies that contained life table analyses for implants and articles that studied root-form implants. There was no restriction on date of publication.

The included studies were published since 1990 and were of a variety of implant systems. Participant ages ranged from 15 to 93 years old.

Two reviewers independently selected studies.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Implant and prosthodontic survival rate related data were extracted at one, three, five, 10 and 15 years. Authors were contacted if further information was needed.

The authors did not state how many reviewers performed data extraction.

Methods of synthesis
Study data were pooled to obtain overall survival rates (%) at each time point. Implant survival and prosthodontic survival were pooled and analysed in the subgroups: surface characteristic (machined or rough); bone-augmentation procedure; prosthetic design; veneering material; and implant number and distribution along the edentulous arch. Survival rates were calculated as point estimates with associated 95% confidence intervals (CIs).

Results of the review
Thirty-two studies were included in the review (n=2,854, range three to 700): 29 prospective (n=2,349) and three were retrospective (n=505). Twenty-four studies reported patient drop-out rates, which ranged from 0 to 45%.

Overall implant survival ranged from 94% at one year to 87.7% at 15 years. Implant survival rates for rough-surface implants ranged from 97.7% (one year) to 98% (10 years); there was no data available at 15 years. Machined implants had survival rates of 92.7% (one year), 89.3% (10 years) and 87.7% (15 years). Implants in native bone showed greater
survival rates than those in augmented bone. Prosthodontic survival rates ranged from 98.2% (one year) to 92.1% (≥10 years). This was only altered by implant number and distribution.

Further results were reported.

**Authors' conclusions**
Implant survival rate decreased from one to 15 years. Implants with rough surfaces had higher survival rates than machined implants at all time points. Implants placed in the edentulous maxilla combined with a bone-augmentation procedure had lower survival rates than those placed in native bone. Machined implants showed a stable survival rate in native bone, but had a lower survival rate in augmented bone. Prosthodontic survival rate decreased slightly from one to 15 years and was only influenced by implant number and distribution.

**CRD commentary**
The research question was supported by clear inclusion criteria. Only two databases were searched and the authors did not report any attempts to identify unpublished studies; therefore, publication bias was possible. The authors only searched for English-language studies; therefore, language bias could not be ruled out. Two reviewers selected studies; it was not reported whether similar precautions to reduce risks of error and bias were taken for data extraction. Validity was not assessed, so the reliability of the results of the primary studies was unknown. The studies appeared to be subject to simple pooling to produce percentages, which may not have been appropriate.

As the methods of pooling data may not have been appropriate and due to the risk of bias during the review process, the authors' conclusions should be viewed with caution.

**Implications of the review for practice and research**
**Practice:** The authors stated that whenever possible an anterior-posterior distribution should be used for implant placement in maxillary reconstructions.

**Research:** The authors did not state any implications for research.

**Funding**
Not stated.

**Bibliographic details**

**PubMedID**
19656021

**DOI**
10.1902/jop.2009.090109

**Original Paper URL**

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Alveolar Ridge Augmentation /methods; Cohort Studies; Dental Implants; Dental Materials /chemistry; Dental Prosthesis Design; Dental Prosthesis, Implant-Supported; Dental Restoration Failure; Dental Veneers; Denture Design;
Follow-Up Studies; Humans; Jaw, Edentulous /rehabilitation /surgery; Maxilla /surgery; Surface Properties; Survival Analysis

**AccessionNumber**
12010000339

**Date bibliographic record published**
10/03/2010

**Date abstract record published**
12/01/2011

**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.