A systematic review of the survival of implants in bone sites augmented with barrier membranes (guided bone regeneration) in partially edentulous patients

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Authors' objectives
To assess the survival of implants in regenerated bone using the method of guided bone regeneration (GBR), compared with the survival of implants in non-regenerated bone in partially endentulous patients.

Searching
The authors searched MEDLINE and handsearched several journals (1990 to May 2001 for both); the search terms and a list of the journals searched were provided. The bibliographies of all relevant papers were examined for additional references.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs), controlled trials, cohort studies, case-control studies, cross-sectional surveys, and case series were eligible for inclusion. To be included in the review, the studies had to present data at least 12 months after the intervention.

Specific interventions included in the review
The intervention included in the review was prosthetic reconstruction of titanium implants in bone regenerated by GBR, with or without membrane supporting materials. Details of the types of implants, membranes and supporting materials used in the included studies were provided.

Participants included in the review
Partially endentulous participants aged 20 years or older were included in the review.

Outcomes assessed in the review
The outcomes included in the review were: implant survival (described as the presence of an implant), implant success (according to the criteria of each study), absence of clinical implant mobility, absence of implant fracture, absence of progressive peri-implant crestal bone loss (as assessed on radiographs without clinical signs of peri-implant infection), and absence of peri-implant infection with suppuration.

How were decisions on the relevance of primary studies made?
Two reviewers independently reviewed the titles of papers identified from the electronic searches. Full papers were retrieved and independently assessed. Any disagreements were resolved by discussion.

Assessment of study quality
The authors did not systematically assess quality.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Survival rates were extracted for the observation period in each study.

Methods of synthesis
How were the studies combined?
A narrative synthesis of the studies was undertaken.
How were differences between studies investigated?
The authors discussed the studies according to their varying follow-up periods.

Results of the review
Eleven studies (with at least 902 participants) were included in the review. Two studies were controlled clinical trials; the others were either case series or cross-sectional surveys.

The authors stated that cumulative success and survival rates for implants in regenerated bone were 100% and 79.4%, respectively, after 5 years of function, with the majority of studies indicating more than 90% after at least one year of function. For survival data, no significant differences were found between implants in regenerated bone compared with non-regenerated bone in the controlled clinical trials.

Authors’ conclusions
The authors concluded that the systematic review was limited by the type and quality (level of evidence) of the included studies. Taking these limitations into consideration, the survival rates of implants placed into sites with regenerated or augmented bone using barrier membranes (79 to 100%) were similar to those generally reported for implants placed conventionally into sites without the need for bone augmentation.

CRD commentary
The authors clearly stated their inclusion criteria. They searched one database and handsearched a number of journals. However, they do not appear to have attempted to identify unpublished studies, thus possibly introducing publication bias into the review. The quality of the included studies was not adequately assessed or presented. The authors were, nevertheless, aware of the limitations of the evidence. The authors’ conclusions were appropriately cautious.

Implications of the review for practice and research
The authors did not state any implications for practice or further research.

Bibliographic details

PubMedID
12787222

Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; Alveolar Ridge Augmentation /methods; Bone Regeneration; Dental Implantation, Endosseous; Dental Implants; Dental Restoration Failure; Guided Tissue Regeneration, Periodontal; Humans; Jaw, Edentulous, Partially/rehabilitation /surgery; Membranes, Artificial

AccessionNumber
12003000831

Date bibliographic record published
28/02/2005

Date abstract record published
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.