Implant survival rate after oral cancer therapy: a review

CRD summary
This review concluded that dental implants could integrate with the bone and remain functionally stable in patients who had undergone oral cancer treatment. While this basic conclusion describes the observed evidence, the review did not give a clear indication of the success rates in practice, nor which variables were associated with success and failure.

Authors' objectives
To determine whether dental implants could integrate with the bone (osseointegrate) and remain functionally stable in patients who had received oral cancer treatment.

Searching
PubMed was searched for relevant publications in English from 1986 to September 2010. Search terms were reported. Handsearching was performed.

Study selection
Clinical studies of dental implants in patients who had undergone radiotherapy or chemotherapy, after oral cancer surgery, were eligible for inclusion.

The studies selected for the review varied in sample size (one to 130 patients), mean patient age (13 to 81 years), radiation dose (20 to 116 Grays), interval between radiotherapy or chemotherapy and implant installation (two months to 14 years), number of dental implants (two to 446), implant location, and the inclusion of hyperbaric oxygen therapy.

It was not clear how many researchers assessed eligibility.

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

Data extraction
Summary information was extracted on participant age, mean radiation dose, interval between therapy and implant installation, length of follow-up, and osteointegration success.

The authors did not describe how these data were extracted.

Methods of synthesis
The authors briefly summarised the study outcomes in a narrative synthesis.

Results of the review
Twenty-one studies were included in the review (2,919 implants). Follow-up ranged from six months to 10 years.

Nineteen studies included patients who had undergone radiotherapy (2,651 implants). Sixteen of these reported that dental implants could osseointegrate and remain functionally stable, with success rates of 89% to 100%. The three remaining studies cautioned that irradiation had negative effects on dental implant survival, with success rates of 69% to 88%.

Two studies included patients who had undergone chemotherapy (268 implants). Both studies reported that chemotherapy did not detrimentally affect the osteointegration or functional stability of dental implants, with success rates of 98% and 99%.

Authors' conclusions
Dental implants could osseointegrate and remain functionally stable in patients who had undergone oral cancer treatment.
CRD commentary
This review provided a somewhat superficial overview of the survival of dental implants in patients who had undergone radiotherapy or chemotherapy following oral cancer surgery. The restriction to studies published in English, the limited number of sources searched, and the lack of procedures to limit errors and bias in study selection, raise the possibility of relevant evidence being missed.

The included studies were summarised using by vote counting, which simply sums the studies with positive and those with negative results, without weighting by sample size or the quality of individual studies. In this review, the definition of a positive or negative result was unclear.

The authors' simple conclusion that dental implants could osseointegrate follows from the observed evidence, but does not give a clear indication of the success rates in practice, nor which variables were associated with success and failure.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.
Research: The authors stated that there was a need for prospective studies with long-term follow-up to establish the effects of radiotherapy and chemotherapy on the survival and stability of dental implants.

Funding
Not stated.

Bibliographic details

PubMedID
21055997

DOI
10.1016/j.oraloncology.2010.10.004

Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; Aged; Aged, 80 and over; Carcinoma, Squamous Cell /radiotherapy /therapy; Dental Implants; Dental Restoration Failure; Female; Humans; Male; Middle Aged; Mouth Neoplasms /radiotherapy /therapy; Osseointegration /radiation effects; Survival Rate

AccessionNumber
12010008222

Date bibliographic record published
20/04/2011

Date abstract record published
16/12/2013

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.