Impact of supportive periodontal therapy and implant surface roughness on implant outcome in patients with a history of periodontitis

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CRD summary
The authors concluded that in patients with a history of periodontitis, it appeared that minimally/moderately rough implants could be used successfully if accompanied by supportive periodontal therapy. Limited evidence from flawed observational studies could only be suggestive and so the reliability of the authors' conclusions was unclear.

Authors' objectives
To evaluate the relationship between periodontitis and tooth implant outcomes and the influence of supportive periodontal therapy (SPT) and implant surface roughness.

Searching
MEDLINE was searched in June 2006 for studies published in English. Search terms were reported. In addition, reference lists of reviews in six specified relevant journals (Clinical Implant Dentistry and Related Research, Clinical Oral Implants Research, International Journal of Oral and Maxillofacial Implants, International Journal of Periodontics and Restorative Dentistry, Journal of Clinical Periodontology and Journal of Periodontology) were handsearched.

Study selection
Prospective and retrospective studies that evaluated outcomes for conventional root-form endosseous implants in patients whose periodontal condition was clearly described were eligible for inclusion. Studies had to follow-up at least 80 per cent of patients for at least one year (under loading). Case reports were only included if they involved eight or more patients (or 10 or more implants). Studies could compare outcomes for patients with and without a history of periodontitis or only report on patients with periodontitis.

The primary review outcomes were early implant loss (lost or removed before prosthetic reconstruction) and late implant loss (lost or removed after reconstruction). Other outcomes were fractured implants, marginal bone loss (based on radiographic examination), attachment level/probing depth, bleeding upon probing and peri-implantitis.

Most studies were in partially edentulous patients. Where reported the age of patients ranged from 21 to 86 years. The duration of follow-up ranged from one to 168 months.

Two reviewers independently selected studies.

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

Data extraction
Data were extracted data onto a standardised form. The authors did not state how many reviewers performed the data extraction. For each study, percentages of patients with outcomes of interest were presented in a table. Adjustments made for potential confounding factors such as smoking, oral hygiene and genetic predisposition was also noted. Many studies did not report outcomes of interest.

Methods of synthesis
The studies were grouped into comparative studies (comparing outcomes across patients with different degrees of periodontitis) and studies that only included patients with a history of periodontitis. Studies were then grouped by outcome and combined in a narrative synthesis. For some outcomes mean rates were calculated for groups of interest. The influence of roughness of implant surface and SPT programme was discussed.

Results of the review
Sixteen studies were included (n=1,638 patients). Multiple implants appeared to be inserted in some patients. There were 11 prospective and five retrospective studies.

Implant outcomes in patients with healthy periodontium versus patients with a history of periodontitis (five studies): Rates of early implant loss were low (0 in both groups in four studies). Rates of late implant loss varied widely (0 to 21 per cent). Five studies reported a higher rate of late implant loss and/or marginal bone loss in patients with a history of periodontitis; three of these studies used rough surface implants and in the other study supportive periodontal therapy (STP) was not given for all patients. Two studies of STP and minimally rough implants reported no difference in late implant loss between patients with and without a history of periodontitis. Studies tended not to adjust for potential confounders.

Implant outcomes in patients with a history of periodontitis (17 studies): Rates of early implant loss were generally low (0 in 10 studies; two studies reported a loss >2.5 per cent). Rates of late implant loss varied widely (0 to 41 per cent, overall mean 6.0 per cent). Rates were higher in implants with a rough surface compared to a minimally/moderately rough surface (overall mean 14.1 per cent across eight studies versus 2.1 per cent across 14 studies).

Results for secondary outcomes were also reported in the paper.

Authors' conclusions
In patients with a history of periodontitis, it appeared that minimally/moderately rough implants could be used successfully if accompanied by supportive periodontal therapy.

CRD commentary
The review question was clearly stated. The database search was limited, but several other relevant sources were consulted. Methods were used to minimise reviewer errors and bias in the selection of studies, but it was not clear whether similar steps were taken in data extraction. Although no formal validity assessment was reported, only studies that met minimum criteria for completeness of follow-up were included and the level of adjustment for confounding was discussed. In view of the difference between studies, a narrative synthesis was appropriate. Some potential causes of differences between studies were discussed. No allowances were made for correlations between outcomes for multiple implants in individual patients. Limited evidence from the included potentially flawed observational studies can only be suggestive and this in combination with incomplete reporting of review methods means that the reliability of the authors’ conclusion was unclear.

Implications of the review for practice and research
Practice: The authors stated that in partially edentulous patients being treated with implants, clinicians should take into account the periodontal health of the remaining teeth, intra-oral translocation of periodontopathogens and the roughness of the implant surface.

Research: The authors stated that longer-term studies with follow-up of at least 10 years were required to evaluate implant outcomes in patients with a history of periodontitis.

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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.