

Tooth preservation or implant placement

A systematic review of long-term tooth and implant survival rates

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Implant therapy is regarded as a safe and reliable method of treating patients with complete or partial edentulism.¹⁻⁵ The use of dental implants as a replacement for “hopeless” or missing teeth has been increasing steadily, probably owing to the high predictability and survival rates, as reported in numerous studies,¹⁻⁵ together with supporting technological advances. Given the increasing popularity and clinical success of dental implants, clinicians may tend to believe that they are as good as natural teeth. This could result in the extraction of teeth that are salvageable, on the basis of convenience rather than as a result of a comparative analysis of prognoses.

A critical stage in treatment planning consists of evaluating the tooth’s prognosis. During this stage, the clinician integrates and considers various factors to select the treatment with the highest probability of success. To this end, the clinician can use several available classification systems,⁵⁻¹⁷ all of which aim to determine the potential fate of the tooth, which leads to its appropriate treatment. We should note that because no criterion standard exists for prognosis classification systems, different methodologies can result in various classifications of the same condition. Therefore, selection of the classification methodology could be critical

ABSTRACT



Background. For the past few decades, dental implants have served as reliable replacements for missing teeth. However, there is an increasing trend toward replacing diseased teeth with dental implants.

Types of Studies Reviewed. The authors conducted a systematic review of long-term survival rates of teeth and implants. They searched the MEDLINE database for relevant publications up to March 2013. They considered studies in which investigators assessed the long-term effectiveness of dental implants or that of tooth preservation. They included only studies that had follow-up periods of 15 years or longer.

Results. The authors selected 19 articles for inclusion. Investigators in nine studies assessed the tooth survival rate, whereas investigators in 10 studies assessed the implant survival rate. When comparing the overall long-term (that is, 15 years or more) tooth loss rate with that of implants, the authors observed rates ranging between 3.6 and 13.4 percent and 0 and 33 percent for teeth and implants, respectively. They could not perform a meta-analysis because of the substantial differences between the studies.

Practical Implications. The results of this systematic review show that implant survival rates do not exceed those of compromised but adequately treated and maintained teeth, supporting the notion that the decision to extract a tooth and place a dental implant should be made cautiously. Even when a tooth seems to be compromised and requires treatment to be maintained, implant treatment also might require additional surgical procedures that might pose some risks as well. Furthermore, a tooth can be extracted and replaced at any time; however, extraction is a definitive and irreversible treatment.

Key Words. Hopeless teeth; periodontal disease; periodontitis; tooth loss; tooth extraction; implant placement; implant loss; implant survival.

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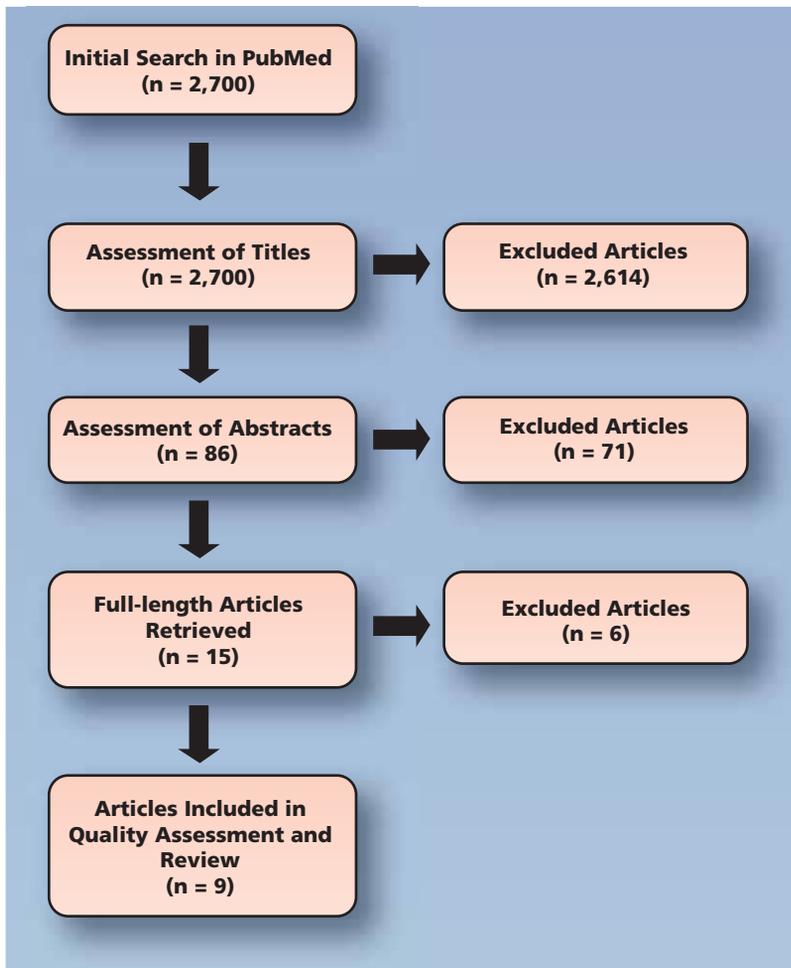


Figure 1. Flowchart of the literature search for tooth survival.

for the tooth’s future, because of the large variations between the systems.¹⁷

Faced with the option of retaining a compromised tooth or extracting the tooth and placing a dental implant, the clinician should make an evidence-based decision.¹⁸⁻²⁰ This decision should account for the predictability of both treatment options over the long term. It is not an easy task to assess treatment alternatives reliably, because the outcome is affected by various factors, not all of which can be accounted for. Among these factors are the patient’s compliance, frequency of maintenance visits (that is, supportive periodontal treatment [SPT]), systemic condition and smoking status, as well as the clinician’s background and experience. Furthermore, the lack of information in the literature regarding the long-term survival and success of implants in relation to the patient’s life expectancy raises doubts about the predictability of this treatment modality for young patients.²¹ Because an implant can serve as a replacement

for an extracted tooth at any point, clinicians may choose to preserve the natural teeth for as long as possible.

Indeed, even when a clinician classifies a tooth as hopeless, extraction is not the only viable solution. The effectiveness of periodontal treatment and long-term SPT in preventing tooth loss in patients with severe periodontal disease has been reported by investigators in many studies.^{6,7,9,11,13,22} One might contemplate whether the possibility of retaining the tooth under enhanced maintenance and treatment is overruled by the availability of dental implants as an attractive alternative. Moreover, the inherent difficulties in determining the predictability of both treatment alternatives, as mentioned earlier, also might be a significant factor in deciding to extract compromised teeth and replace them with dental implants.

To provide insight into this important issue, we conducted a systematic review to assess the long-term survival rates and treatment outcomes for retained compromised teeth in comparison with the long-term survival

rates for dental implants. Our focused question was this: Is the long-term survival rate of dental implants comparable to that of natural teeth that are adequately treated and maintained?

METHODS

To identify studies for this review, we searched MEDLINE’s electronic database (via PubMed) from its earliest records until March 2013. The search was restricted to English-language publications. The search strategy included only studies with a follow-up period of at least 15 years. We included prospective longitudinal studies and retrospective studies in our search. The main outcomes sought were long-term survival of teeth and implants. Inclusion criteria con-

ABBREVIATION KEY. **AgP:** Aggressive periodontitis. **APT:** Active periodontal treatment. **CP:** Chronic periodontitis. **DM:** Diabetes mellitus. **NA:** Not available. **NR:** Not relevant. **SPT:** Supportive periodontal treatment.

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