



Surgical treatment of soft tissue dehiscence in dental implants: a systematic review

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ABSTRACT

Introduction: Replacing missing teeth with dental implants is currently an accepted and effective approach for restoring both function and aesthetics. Peri-implant soft tissue dehiscence is characterized by recession of the gingival margin around implant-supported crowns, with or without exposure of the implant's metal components. This systematic review aims to evaluate the effectiveness of different surgical techniques used in the treatment of peri-implant soft tissue dehiscence. Several surgical approaches, including coronally advanced flap procedures, connective tissue grafts and tunnel techniques, have been proposed for the management of these defects, although their relative effectiveness remains unclear.

Objectives: This systematic review aims to evaluate the effectiveness of different surgical techniques used in the treatment of peri-implant soft tissue dehiscence.

Methods: This systematic review was conducted according to PRISMA guidelines and registered in PROSPERO (CRD420251002309). The research question was structured using the PICO framework. A bibliographic search was performed in the PubMed, ScienceDirect, EBSCO, and B-on databases using the keywords "soft-tissue dehiscence", "peri-implant dehiscence", "soft-tissue recession", "peri-implant recession", "dental implants" and "treatment". After duplicate removal, titles, abstracts and full texts were screened according to predefined inclusion and exclusion criteria. The Joanna Briggs Institute critical appraisal tool for randomized clinical trials and case studies was used to assess the risk of bias. Eleven studies were included, comprising two randomized clinical trials and nine case series.

Results: From an initial 459 records, 11 studies involving 130 implants in 123 patients were included. The results indicate that, among the various surgical approaches analyzed, the coronally advanced flap technique combined with connective tissue grafting remains the most widely adopted. Mean defect coverage ranged from 28% to 99.2%, while complete defect coverage ranged from 0% to 90.9% of treated implants. Overall, this approach demonstrated superior outcomes in terms of tissue coverage and aesthetic improvement, with consistent improvements in peri-implant soft

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tissue thickness, keratinized mucosa width, and aesthetic outcomes. The randomized clinical trial comparing techniques demonstrated superior outcomes for coronally advanced flap associated with connective tissue graft compared with the tunnel technique.

Conclusion: Current evidence suggests that coronally advanced flap procedures combined with connective tissue grafts may provide the most predictable clinical and aesthetic outcomes for the treatment of peri-implant soft tissue dehiscence. It is concluded that further studies, particularly randomized clinical trials, are needed to more rigorously determine the most effective technique for correcting peri-implant soft tissue dehiscence.
