



Reconstructive surgery in the treatment of peri-implantitis: the effect of membrane use – a systematic review

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ABSTRACT

Introduction: Peri-implantitis is a biofilm-associated pathological condition characterized by inflammation of peri-implant tissues and progressive loss of supporting bone. Reconstructive surgical therapy has been proposed to regenerate lost peri-implant tissues through the use of bone substitutes and barrier membranes. However, the additional clinical value of resorbable membranes remains uncertain.

Objectives: To systematically evaluate the effectiveness of resorbable membranes as an adjunct to reconstructive surgical treatment of peri-implantitis.

Methodology: A structured systematic search was performed according to the PICO framework and PRISMA guidelines to identify eligible clinical studies assessing reconstructive peri-implantitis surgery with and without the use of resorbable membranes. Electronic databases searched included PubMed, B-On, SciELO, Web of Science, and Scopus. The search terms “Peri-implantitis,” “Reconstructive,” “Bone graft,” “Membrane,” and “Biomaterial” were combined using Boolean operators. Studies published in English or Portuguese within the last 15 years were considered. Inclusion criteria comprised clinical studies involving patients diagnosed with peri-implantitis undergoing reconstructive surgical treatment with resorbable membranes, with a minimum follow-up period of 6 months, and reporting outcomes such as probing depth (PPD), bleeding on probing (BoP), and suppuration (SUP). Eligible study designs included randomized clinical trials, prospective case series, and clinical guidelines. Systematic reviews, narrative reviews, and animal studies were excluded. Methodological quality was assessed using the Cochrane Risk of Bias Tool (RoB 2) for randomized clinical trials and the ROBINS-I tool for prospective case series.

Results: A total of 318 records were identified, of which 10 studies (178 patients, 223 implants) fulfilled the inclusion criteria and were included in the final qualitative analysis. Across the selected studies, reconstructive treatment with resorbable membranes did not consistently demonstrate superior outcomes compared with reconstructive treatment without membranes. Most investigations reported no statistically significant differences between groups regarding PPD reduction, BoP reduction or radiographic bone gain. Disease resolution rates varied substantially

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among studies, reflecting heterogeneity in treatment protocols, defect morphology, follow-up periods, and success criteria. In some studies, baseline defect configuration, smoking habits, and maintenance protocols appeared to influence therapeutic outcomes.

Conclusion: Current evidence does not support a clear additional clinical or radiographic benefit from the adjunctive use of resorbable membranes in reconstructive peri-implantitis surgery. Nevertheless, the limited number of high-quality randomized clinical trials, together with methodological variability and non-standardized success criteria, underscores the need for further well-designed studies to better define the role of membranes in different peri-implant defect configurations.
