

Periodontal Regeneration – Furcation Defects: A Consensus Report From the AAP Regeneration Workshop

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Background: Treatment of furcation defects is a core component of periodontal therapy. The goal of this consensus report is to critically appraise the evidence and to subsequently present interpretive conclusions regarding the effectiveness of regenerative therapy for the treatment of furcation defects and recommendations for future research in this area.

Methods: A systematic review was conducted before the consensus meeting. This review aims to evaluate and present the available evidence regarding the effectiveness of different regenerative approaches for the treatment of furcation defects in specific clinical scenarios compared with conventional surgical therapy. During the meeting, the outcomes of the systematic review, as well as other pertinent sources of evidence, were discussed by a committee of nine members. The consensus group members submitted additional material for consideration by the group in advance and at the time of the meeting. The group agreed on a comprehensive summary of the evidence and also formulated recommendations for the treatment of furcation defects via regenerative therapies and the conduction of future studies.

Results: Histologic proof of periodontal regeneration after the application of a combined regenerative therapy for the treatment of maxillary facial, mesial, distal, and mandibular facial or lingual Class II furcation defects has been demonstrated in several studies. Evidence of histologic periodontal regeneration in mandibular Class III defects is limited to one case report. Favorable outcomes after regenerative therapy for maxillary Class III furcation defects are limited to clinical case reports. In Class I furcation defects, regenerative therapy may be beneficial in certain clinical scenarios, although generally Class I furcation defects may be treated predictably with non-regenerative therapies. There is a paucity of data regarding quantifiable patient-reported outcomes after surgical treatment of furcation defects.

Conclusions: Based on the available evidence, it was concluded that regenerative therapy is a viable option to achieve predictable outcomes for the treatment of furcation defects in certain clinical scenarios. Future research should test the efficacy of novel regenerative approaches that have the potential to enhance the effectiveness of therapy in clinical scenarios associated historically with less predictable outcomes. Additionally, future studies should place emphasis on histologic demonstration of periodontal regeneration in humans and also include validated patient-reported outcomes.

Clinical Recommendations: Based on the prevailing evidence, the following clinical recommendations could be offered. 1) Periodontal regeneration has been established as a viable therapeutic option for the treatment of various furcation defects, among which Class II defects represent a highly predictable scenario. Hence, regenerative periodontal therapy should be considered before resective therapy or extraction; 2) The application of a combined therapeutic approach (i.e., barrier, bone replacement graft with or without biologics) appears to offer an advantage over monotherapeutic algorithms; 3) To achieve predictable regenerative outcomes in the treatment of furcation defects, adverse systemic and local factors should be evaluated and controlled when possible; 4) Stringent postoperative care and subsequent supportive periodontal therapy are essential to achieve sustainable long-term regenerative outcomes. *J Periodontol 2015;86(Suppl.):S131-S133.*

KEY WORDS

Bone regeneration; furcation defects; regeneration, periodontal guided tissue; wound healing.

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SUMMARY OF EVIDENCE REGARDING REGENERATIVE THERAPY FOR FURCATION DEFECTS

The systematic review¹ that preceded this consensus report was performed to answer the following question: in human adults with periodontal furcation involvement (Class I, Class II, and/or Class III according to Hamp et al.²), are clinical, radiographic, histologic, microbiologic, and patient-reported outcomes improved with regenerative therapy compared with non-regenerative surgical treatment?

The group appraised the systematic review and accepted the following conclusions: 1) Periodontal regeneration has been demonstrated histologically and clinically for the treatment of maxillary facial, mesial, distal, and mandibular facial or lingual Class II furcation defects;³⁻⁵ 2) Although periodontal regeneration has been demonstrated histologically for the treatment of mandibular Class III defects, the clinical evidence is limited to one case report;⁶ 3) Evidence supporting regenerative therapy in maxillary Class III furcation defects in molars⁷ and premolar furcation defects⁸ is limited to clinical case reports, which reported unpredictable outcomes; and 4) In Class I furcation defects, regenerative therapy may be beneficial in certain clinical scenarios, although most Class I furcation defects may be successfully treated with non-regenerative therapy.

Additionally, the group formulated a series of treatment recommendations based on current evidence: 1) Periodontal regeneration has been established as a viable therapeutic option for the treatment of various furcation defects, among which Class II defects represent a highly predictable scenario; 2) Regenerative periodontal therapy should be considered before resective therapy or extraction; 3) Based on the current state-of-the-art reports, the application of a combined therapeutic approach (i.e., barrier, bone replacement graft with or without biologics) appears to offer an advantage over monotherapeutic algorithms; 4) To achieve predictable regenerative outcomes in the treatment of furcation defects, adverse systemic and local factors should be evaluated and controlled when possible; and 5) Stringent postoperative care and subsequent supportive periodontal therapy (maintenance) are essential to achieve sustainable long-term regenerative outcomes.

IMPLICATIONS OF REVIEW TO PATIENT-REPORTED OUTCOMES

Based on the appraisal of the reviewed literature, there are limited data regarding quantifiable patient-reported outcomes. Hence, future studies should consider oral health-related quality of life and patient satisfaction as outcome measures.

Postoperative Pain (Short and Long Term)

Future research should focus on assessing postoperative pain and pain management strategies to cope with the pain. Modulating factors, such as the operator's experience and the patient's psychosocial state, such as depression, anxiety, and stress, should be included in all assessments.

Esthetics

Typically, patient-perceived esthetics related to furcation treatment is not a relevant outcome, except for patients with a wide smile line.

Satisfaction

Future research should include patient satisfaction assessments with a validated method, such as the scale of treatment satisfaction by Kiyak et al.⁹

RESEARCH PRIORITIES FOR THE FUTURE

1) Considering the prevailing evidence for the treatment of furcation defects identified within this review, future research efforts should be focused on assessing emerging regenerative approaches that have the potential to enhance the outcomes of therapy, including clinical scenarios associated historically with less predictable outcomes.

2) Investigators should also focus on the understanding of the influence that insufficiently studied local, technical, and systemic factors, such as metabolic disorders, have on the outcomes of regenerative therapy for the treatment of furcation defects.

3) Ideally, future studies should investigate non-invasive methods to demonstrate evidence of regeneration of the periodontal attachment apparatus in furcation defects in humans, rather than human histology, which is still considered the ultimate proof of periodontal regeneration.

4) Future studies should also assess patient-reported, advanced radiographic (i.e., three-dimensional) and biomolecular (i.e., expression of biomarkers) outcomes via standardized data collection protocols.

5) Future studies should include long-term results that may guide therapeutic prognosis of teeth presenting furcation defects.

6) Methodologic additions are expected to provide critical information to better understand the effect

that periodontal regenerative therapies have on the quality of life of patients presenting furcation defects, which will be of great value to develop cost-effective and predictable clinical protocols.

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