Periodontal Soft Tissue Root Coverage Procedures: A Consensus Report From the AAP Regeneration Workshop

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Background: Management of gingival recession defects, a common periodontal condition, using root coverage procedures is an important aspect of periodontal regenerative therapy. The goal of the periodontal soft tissue root coverage procedures group was to develop a consensus report based on the accompanying systematic review of root coverage procedures, including priorities for future research and identification of the best evidence available to manage different clinical scenarios.

Methods: The group reviewed and discussed the accompanying systematic review, which covered treatment of single-tooth recession defects, multiple-tooth recession defects, and additional focused questions on relevant clinical topics. The consensus group members submitted additional material for consideration by the group in advance and at the time of the meeting. The group also identified priorities for future research.

Results: All reviewed root coverage procedures provide significant reduction in recession depth, especially for Miller Class I and II recession defects. Subepithelial connective tissue graft (SCTG) procedures provide the best root coverage outcomes. Acellular dermal matrix graft (ADMG) or enamel matrix derivative (EMD) in conjunction with a coronally advanced flap (CAF) can serve as alternatives to autogenous donor tissue. Additional research is needed to do the following: 1) assess the treatment outcomes for multiple-tooth recession defects, oral sites other than maxillary canine and premolar teeth, and Miller Class III and IV defects; 2) assess the role of patient- and site-specific factors on procedure outcomes; and 3) obtain evidence on patient-reported outcomes.

Conclusions: Predictable root coverage is possible for single-tooth and multiple-tooth recession defects, with SCTG procedures providing the best root coverage outcomes. Alternatives to SCTG are supported by evidence of varying strength. Additional research is needed on treatment outcomes for specific oral sites.

Clinical Recommendation: For Miller Class I and II single-tooth recession defects, SCTG procedures provide the best outcomes, whereas ADMG or EMD in conjunction with CAF may be used as an alternative. *J Periodontol 2015;86(Suppl.):S52-S55.*

KEY WORDS

Gingiva, surgery; gingival recession; guided tissue regeneration, periodontal; surgical flaps; tissue engineering; transplantation, autologous.

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GENERAL SUMMARY OF THE TOPICS COVERED

The accompanying systematic review[1] included data from 17 systematic reviews and 94 randomized clinical trials, as well as from 114 controlled clinical trials, case series, and case reports evaluating recession areas that were treated by means of root coverage procedures. The systematic review reported the outcomes of 12 meta-analyses.[1] The focused questions within the systematic review covered the following topics.

What Is the Efficacy and Predictability of Root Coverage Procedures by the Degree of Recession?

Miller[2] Class I and II single-tooth recession defects. All reviewed procedures (i.e., free gingival grafts; coronally advanced flaps [CAFs] alone or in combination with guided tissue regeneration [GTR]; acellular dermal matrix grafts [ADMGs]; enamel matrix derivative [EMD] protein; xenogenic collagen matrix [CM] grafts or other biomaterials [e.g., bone substitutes, platelet-rich plasma]; laterally positioned flaps; and subepithelial connective tissue grafts [SCTGs] alone or in combination with CAFs) will provide significant reduction in recession depth.

SCTG-based procedures provided the best outcomes for mean and complete root coverage, as well as increase of keratinized tissue.

There is strong evidence to support the use of ADMG or EMD in conjunction with CAF as alternatives to autogenous donor tissue.

There is limited evidence that platelet-derived growth factor and xenogenic CM may be used as alternatives to autogenous donor tissue.

The root coverage achieved may be maintained long term (>24 months). SCTG, EMD in conjunction with CAF, and ADMG provide long-term stable root-coverage results.

Miller Class I and II multiple-tooth recession defects. Root coverage procedures are effective, although the evidence is limited.

SCTG procedures seem to be the best option in terms of clinical outcomes.

ADMG or EMD in conjunction with CAF may be used as alternatives to autogenous donor tissue.

Miller Class III recession defects. SCTG-based procedures provide significant benefit, supported by limited evidence.

Alternatively, EMD + CAF, ADMG + CAF, and GTR + CAF may be used as graft substitutes, although the available evidence is minimal.

Miller Class IV recession defects. Data from a limited number of case reports suggest that these defects may be improved, but outcomes are not predictable.

Recession defects in molar teeth and the lingual aspect of teeth. Root coverage is possible, but evidence on predictability is insufficient.

Which Factors May Influence the Expected Outcomes?

Patient-, site-, and technique-related factors influence the expected outcomes of root-coverage procedures.

For patient-related factors, there is evidence that smoking adversely affects the outcomes of root-coverage procedures.

For site-related factors (other than Miller classification), non-carious cervical lesions, whether restored or not, may be effectively treated by SCTG + CAF and CAF. There is limited evidence that root coverage procedures can be effective in the treatment of previously restored or carious root surfaces. Defect depth has been demonstrated to negatively correlate with the degree of root coverage attained. Initial tissue thickness directly correlates with the predictability of complete root coverage.

For technique-related factors, surgical positioning of the tissue margin coronal to the cemento-enamel junction improves complete root-coverage outcomes. There is limited evidence that other technical aspects (e.g., flap tension and use of vertical releasing incisions) influence outcomes. The use of microsurgical techniques results in improved outcomes.

What Is the Anticipated Success and Attachment Apparatus of Root Coverage Enhancements With Autogenous Grafts Compared With Alternative Methods and Materials?

There is strong evidence that root coverage procedures result in stable clinical attachment level gains accompanied by shallow probing depths.

Proof-of-principle human histologic evidence has demonstrated that limited periodontal regeneration can occur after root coverage procedures.

Most of the root coverage techniques result in the formation of a long junctional epithelial attachment.

What Are the Long- and Short-Term Advantages of Root Surface Biomodification?

Chemical root-surface biomodification has not been demonstrated to influence clinical results.

What Are the Relative Risks from a Patient's Viewpoint With the Different Approaches to Root-Coverage Procedures?

There is no evidence on the relative risks from the patient's viewpoint.

Should CTGs Contain Epithelium and/or Periosteum?

The limited available evidence suggests that inclusion of an epithelial collar does not provide additional benefits in terms of root coverage.

There is lack of evidence on the possible effect of periosteum-containing CTGs.

Do We Have Evidence for Innovation When Treating Thin and Thick Biotypes With Existing Treatment Modalities?

SCTG, ADMG, and CM can increase soft tissue thickness.

IMPLICATIONS OF REVIEW TO PATIENT-REPORTED OUTCOMES

Flap procedures alone or in association with biomaterials have been described as less painful, whereas use of palatal donor tissue has been associated with increased complications.

Limited data suggest a positive effect of root coverage procedures on dentinal hypersensitivity.

Other patient-reported outcomes (such as esthetics, patient satisfaction, and convenience) have not been adequately investigated.

RESEARCH PRIORITIES FOR THE FUTURE

The consensus group identified the following priorities for future research. 1) The majority of the evidence is based on single-tooth facial defects in maxillary canine and premolar teeth. Additional research on the treatment of multiple recession defects and other oral sites, including lingual/palatal sites, is needed.[3,4] 2) Most studies have been conducted on Miller Class I and II defects, and they do not differentiate results by class. Additional research on outcomes in Miller Class III and IV defects is needed. Data reporting should be stratified by Miller Class.[5] 3) There is limited evidence on patient-reported outcomes. Additional research on pain, esthetics, patient satisfaction, quality of life, and cost-benefit is needed.[3,6] 4) The only patient-related factor investigated (smoking) has been limited to SCTG and CAF procedures. Additional research on the effect of patient-related factors on root-coverage outcomes is recommended. 5) The evidence on site-specific factors (such as periodontal phenotype, presence of aberrant frenal attachment, root prominence, and shallow vestibule) is limited. Additional research on site-specific characteristics (such as root prominence, initial vestibular depth, aberrant frenal attachment, and tissues thickness versus tissue quality) is recommended. 6) There is lack of evidence on the potential significance of recession etiology as related to outcomes. Research on the significance of recession etiology for long-term treatment outcomes is recommended. 7) There is limited evidence on the long-term outcomes of root-coverage procedures. Additional research on how factors (such as patient habits, periodontal phenotype, and anatomic location) might affect the long-term stability of outcomes is recommended.[5] 8) Additional research on comparison of surgical techniques (recipient site surgical preparation) and biomaterials is recommended.[7-10]

CLINICAL RECOMMENDATION CONCLUSIONS

Predictable root coverage is possible for recession defects. For Miller Class I and II single-tooth recession defects, SCTG procedures provide the best root coverage outcomes. ADMG or EMD in conjunction with CAF can serve as alternatives to autogenous donor tissue.

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