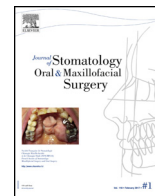




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Review

Alternatives to connective tissue graft in the treatment of localized gingival recessions: A systematic review

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ABSTRACT

Aim: The aim of this Systematic Review (SR) was to assess the clinical efficacy of alternatives procedures; Acellular Dermal Matrix (ADM), Xenogeneic Collagen Matrix (XCM), Enamel Matrix Derivative (EMD) and Platelet Rich Fibrin (PRF), compared to conventional procedures in the treatment of localized gingival recessions.

Material and methods: Electronic searches were performed to identify randomized clinical trials (RCTs) on treatment of single gingival recession with at least 6 months of follow-up. Applying guidelines of the Preferred Reporting Items for Systematic Review and Meta-Analyses statement (PRISMA). The risk of bias was assessed using the Cochrane Collaboration's Risk of Bias tool.

Results: Eighteen randomized controlled trials (RCTs) with a total of 390 treated patients (606 recessions) were included. This systematic review showed that: Coronally Advanced Flap (CAF) in conjunction with ADM was significantly better than CAF alone, while the comparison between CAF + ADM and CTG was affected by large uncertainty. The CAF + EMD was significantly better than CAF alone, whereas the comparison between CAF + EMD and CTG was affected by large uncertainty. No significant difference was recorded when comparing CAF + XCM with CAF alone, and the comparison between CAF + XCM and CTG was affected by large uncertainty. The comparison between PRF and others technique was affected by large uncertainty.

Conclusion: ADM, XCM and EMD assisted to CAF might be considered alternatives of CTG in the treatment of Miller class I and II gingival recession.

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Gingival recession is characterized by the exposure of the tooth root surface due to the migration of the apical gingival margin tissue relative to the cement enamel junction [1,2]. Plaque-induced inflammation and toothbrush trauma have been proposed as etiologic factors [3,4], even though this point still needs elucidation [5].

Diverse surgical techniques were proposed for the treatment of the gingival recessions. Preferably, treatment options should be based on systematic, unbiased, and objective evaluations of the literature [6].

A previous systematic review showed that the connective tissue graft (CTG) plus coronally advanced flap (CAF) is considered the gold standard technique in treatment of gingival recessions [7,8].

However, CTG has a number of disadvantages: a secondary harvesting surgery for donor tissue is required; increased morbidity may be associated with the donor surgery; and a limited amount of donor tissue is available, limiting the number of defect sites treated per patient visit [9,10].

To overcome such limitations, and in order to increase the effectiveness of root coverage techniques, other approaches have been proposed such as: Acellular Dermal Matrix (ADM) [11–14], Xenogeneic Collagen Matrix (XCM) [15–18], Enamel Matrix Derivative (EMD) [19–23] and Platelet Rich Fibrin (PRF) in combination with CAF [24–28].

Clinical decline and knowledge about the effectiveness of these new techniques remain very limited. More studies are needed (Scheyer et al., 2015) [29].

The aim of this Systematic Review (SR) was to assess the clinical efficacy of alternatives procedures; Acellular Dermal Matrix (ADM), Xenogeneic Collagen Matrix (XCM), Enamel Matrix Derivative (EMD) and Platelet Rich Fibrin (PRF), compared to

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conventional procedures in the treatment of localized gingival recessions.

1. Material and methods

A detailed protocol was designed according to the PRISMA (Preferred Reporting Items Systematic review and Meta-Analyses) statement [30]. The present manuscript was written according to PRISMA checklist.

1.1. Information sources and search

Literature search was conducted on electronic databases until September 2016 to identify studies included or investigated for this review. Three online evidence sources were used: MEDLINE (PubMed), Cochrane and EBSCO.

The search was performed independently and in duplicate by two authors (A.K. and E.Y.). Six keywords were used: 1) acellular dermis, 2) collagen, 3) dental Enamel Proteins, 4) platelet rich fibrin, 5) gingival recession, 6) randomized controlled trial, according to 10 combinations:

- 1 AND 5 AND 6;
- 2 AND 5 AND 6;
- 3 AND 5 AND 6;
- 4 AND 5 AND 6;
- 1 AND 2 AND 5 AND 6;
- 1 AND 3 AND 5 AND 6;
- 1 AND 4 AND 5 AND 6;
- 2 AND 3 AND 5 AND 6;
- 2 AND 4 AND 5 AND 6;
- 3 AND 4 AND 5 AND 6.

1.2. Eligibility criteria

1.2.1. Inclusion criteria

The inclusion criteria consisted of the following:

- randomized controlled trials (RCTs) that compared each of these techniques (ADM, EMD, XCM and PRF) with conventional mucogingival procedures for the treatment of single gingival recession of at least 6 months duration were considered;
- articles from the last 10 years;
- there were no restrictions on language.

1.2.2. Exclusion criteria

The exclusion criteria consisted of the following:

- non-RCTs, retrospective, cross-sectional, case series, case reports;
- RCTs comparing variations of the same technique;
- randomized controlled trials comparing CAF with multiple combinations.

1.3. Selection

Criteria used in this SR for studies selection were based on the PICO method, according to the following points.

1.3.1. Types of participants (P)

Patients with a clinical diagnosis of Miller Class I or II localized gingival recession defect.

1.3.2. Types of interventions (I)

The following surgical procedures for the treatment of single recessions were considered:

- CAF plus Acellular Dermal Matrix (CAF + ADM);
- CAF plus Xenogeneic Collagen Matrix (CAF + XCM);
- CAF plus Enamel Matrix Derivative (CAF + EMD);
- CAF plus Platelet Rich Fibrin (CAF + PRF).

1.3.3. Comparison between interventions (C)

All possible comparisons among the included surgical procedures were investigated.

1.3.4. Type of outcome measures (O)

The following outcome measures were considered:

- primary outcome: complete root coverage (CRC): recession defects that obtained CRC.
- secondary outcomes:
 - recession reduction (RecRed): change in gingival recession expressed as RecRed (mm) at follow-up visit,
 - keratinized tissue gain (KT gain): change (mm) in width of keratinized tissue at follow-up visit.

1.4. Assessment of quality and risk of bias

Three main quality criteria were examined: allocation concealment, blinding treatment outcomes to outcome assessors and completeness of follow-up.

After quality assessment, studies were grouped into three categories:

- low risk of bias, if all three quality criteria were met;
- unclear risk of bias, if one or more criteria were partially met;
- high risk of bias, if one or more of the three quality criteria was not met.

This evaluation was performed independently and in duplicate form by two review authors (A.K. and E.Y.). According to Cochrane Handbook for Systematic Reviews of Interventions [31].

1.5. Data abstraction

The following information was extracted independently by two review authors (A.K. and E.Y.). Data extracted were: title, authors' names, year of publication, study design, number of participants, outcome measures, type of intervention, duration of study, clinical outcomes and study quality.

2. Results

2.1. Study selection

The search results are presented in Fig. 1. The electronic search in MEDLINE (by PubMed), in the Cochrane Collaboration databases, and in EMBASE provided, respectively, 161, 75 and 179 articles published between 2006 and 2016.

Subsequently, after reading all the abstracts and discarding duplicates, 38 articles were selected.

The full text reading of the 38 articles allowed the selection of 18 studies that met the inclusion criteria of this systematic review.

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