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Editors: Phoebus Madianos, Andreas Stavropoulos (EFP scientific affairs committee).

Rapporteurs:

Hiba Abu-Hussein, Anat Katorza, and Alaa Khutaba,
with Dr Jacob Horwitz.

Affiliation:

Postgraduate programme in periodontology,
Department of Periodontology, School of Graduate Dentistry,
Rambam Health Care Campus, Haifa, Israel

study

Root coverage for single gingival recessions: systematic review and meta-analysis

Authors:

Anna Dai, Jia-Ping Huang, Pei-Hui Ding, Li-Li Chen

Background

Several techniques for root-coverage procedures are proposed in the literature, including the coronally advanced flap (CAF), CAF with the additional use of a connective-tissue graft (CTG), and CAF with the additional use of CTG substitutes, such as acellular dermal matrix (ADM) or xenogeneic collagen matrix (XCM).

Root-surface conditioners – including enamel matrix derivative (EMD) and platelet-rich fibrin (PRF) – have also been tested as adjuncts to these procedures.

A previous systematic review, including meta-analysis, showed no differences for mean root coverage (MRC) and gain in clinical attachment level (CAL) between CAF + CTG and CAF + ADM (Gallagher & Matthews, 2017). Similarly, another systematic review failed to show strong evidence regarding the adjunctive use of EMD or PRF in terms of mean root coverage (Karam et al., 2016).

These systematic reviews assessed the short-term outcome of therapy (i.e. six to 12 months), but there are reports showing a tendency for relapse after a period of between two and five years. Thus, there is a need for a systematic assessment of the long-term outcome of root-coverage procedures.

Aims

The aim of this systematic review and meta-analysis was to evaluate the long-term (≥ 2 years) stability of root-coverage procedures used for single gingival recessions in terms of complete root coverage, mean root coverage, and width of keratinized tissue.

Materials & methods

This systematic review included only randomised controlled trials (RCTs) for the treatment of gingival recession in patients with a clear clinical diagnosis of non-restored, localised gingival recession without loss of interdental attachment, with a follow-up time of at least two years.

The primary outcomes were complete root coverage (CRC) and mean root coverage (MRC). The secondary outcomes were width of keratinized tissue (KTW) and patient-centred parameters.

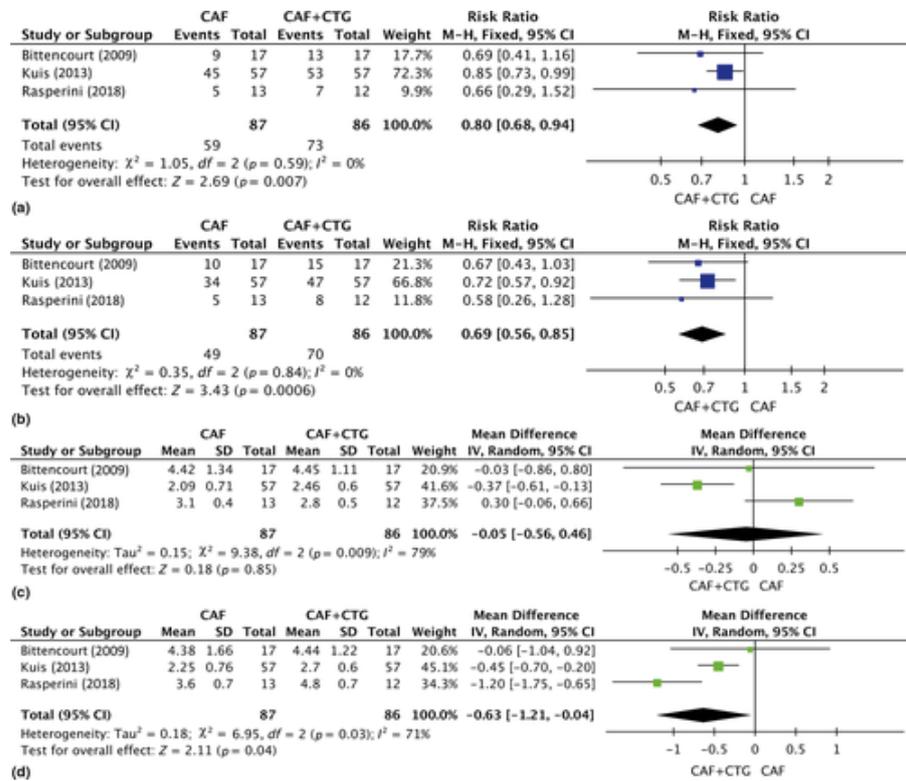
Three online clinical evidence-based databases (MEDLINE, the Cochrane Central Register of Controlled Trials, and Embase) and one grey database for unpublished data were used to search for papers published before July 31, 2018, without language restriction.

After selecting the studies, the following data were extracted: (a) authors, year of publication, study design, types of intervention, follow-up duration, setting, and funding; (b) characteristics of the participants and recessions; (c) primary and secondary outcomes.

Risk of bias – i.e. “low”, “moderate”, “high”, or “unclear” – was assessed for all included studies.

Figure

Forest plot comparing short-term and long-term outcomes of CAF + CTG versus CAF in the treatment of single gingival recessions in terms of the following: (a) complete root coverage (CRC) in short-term; (b) complete root coverage (CRC) in long-term; (c) width of keratinized tissue (KTW) in short-term; (d) width of keratinized tissue (KTW) in long-term



Results

From a total of 908 titles and abstracts, 15 RCTs were selected.

A total of 318 participants with 604 recessions were originally included in those studies; 48 patients dropped out during the follow-up period, which ranged from two to 14 years.

The results showed:

- After CAF, there was no significant difference in term of CRC between short-term and long-term results. Nevertheless, there was a statistically higher MRC (in %) in the short term vs. the long term.
- After CAF+CTG, there were no significant differences in CRC or MRC change in the short term vs. the long term.

- Comparing CAF+CTG vs. CAF, there was a statistically significant difference in favour of CAF+CTG in both the short- and the long-term results in terms of MRC:
 - After six months, the reported MRC was 91.9%±16.4% in the CAF group vs. 97.2%±10.6% in the CAF+CTG group.
 - After five years, the reported MRC was 82.7%±23.8% in the CAF group and 92.3%±19.2% in the CAF+CTG group.
- No significant differences in terms of change in KTW from short term to long term were observed for CAF or for CAF+CTG.
- In the short term, no significant differences in terms of KTW were observed between CAF and CAF+CTG. However, in the long term, CAF+CTG resulted in greater KTW than CAF alone ($p=0.04$).
- After CAF+EMD, there was no significant difference between the short-term vs. long-term results in terms of CRC ($p = 0.21$).

Limitations

- Most of the included studies had a moderate risk of bias and one was even assessed as having a high risk of bias.
- The different follow-up times of the included studies may add to bias.
- Lack of a standardised questionnaire made it difficult to quantitatively compare patients' aesthetic satisfaction after different procedures.

Conclusions & impact

- CAF alone may show some relapse over time.
- CAF+CTG shows better long-term stability compared with CAF.
- EMD as an adjunct may enhance the stability of the results of CAF.
- There is insufficient evidence available regarding the possible effectiveness of CTG substitutes or other root-surface modifications in terms of the long-term stability of results.
- For single gingival recessions, the use of CTG+CAF yields the best and most stable root-coverage outcome.

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