Treatment of gingival recession with coronally advanced flap procedures: a systematic review

Cairo F, Pagliaro U, Nieri M

CRD summary
The review concluded that coronally advanced flap or enamel matrix derivative in conjunction with coronally advanced flap enhances the probability of obtaining complete root coverage in Miller Class I and II single gingival recessions. The review was generally well conducted and the authors’ conclusions are reliable.

Authors’ objectives
To assess the effectiveness of coronally advanced flap (CAF) alone or in combination with connective tissue graft, barrier membranes, enamel matrix derivative, acellular dermal matrix, platelet-rich plasma or living tissue-engineered human fibroblast-derived dermal substitute (HF-DDS) in the treatment of Miller Class I and II localised gingival recessions.

Searching
A register of clinical trials published in previous systematic reviews, MEDLINE and The Cochrane Oral Health Group Trials Register were searched for articles in any language. Search dates varied across sources (up to September 2007). Search terms were reported. Key journals and reference lists of identified articles were handsearched. Unpublished studies were sought by contacting investigators in the field.

Study selection
Randomised controlled trials (RCTs) that included a split-mouth model, had six 6 months or more follow-up and that compared the effects of CAF alone or in combination with connective tissue grafts, barrier membranes, enamel matrix derivative, acellular dermal matrix, platelet-rich plasma or HF-DDS in patients with Miller Class I or II localised single gingival recessions were eligible for inclusion. Studies that compared CAF with multiple combinations or compared variations of the same technique were excluded. The primary outcome measure was recession defects that obtained complete root coverage. Secondary outcomes included: gingival recession reduction (RecRed); clinical attachment level; keratinized tissue gain; postoperative healing complications; postoperative pain; aesthetic satisfaction; and root sensitivity.

The duration of follow-up ranged from six to 72 months. Procedures considered in patients with Miller I or II gingival included: CAF versus CAF+connective tissue graft; CAF versus CAF and barrier membranes; CAF versus CAF and enamel matrix derivative; CAF versus CAF and acellular dermal matrix; CAF versus CAF and platelet-rich plasma; CAF and connective tissue graft versus CAF and barrier membranes; CAF and connective tissue graft versus CAF and enamel matrix derivative; CAF and connective tissue graft versus CAF and acellular dermal matrix; and CAF and connective tissue graft versus CAF and HF-DDS. Patients’ age ranged from 18 to 71 years.

Two reviewers independently assessed studies for inclusion. The authors did not state how any disagreements were resolved.

Assessment of study quality
Two reviewers independently assessed study quality based on the adequacy of allocation concealment, blinding of outcome assessors and completeness of follow-up. Studies were grouped into low risk of bias and high risk of bias. Disagreements were resolved through discussions with a third reviewer.

Data extraction
Data on number or percentage of treated teeth that achieved complete root coverage, mean RecRed reduction, mean keratinized tissue width increase and mean clinical attachment level gain were extracted in order to calculate odds ratios (ORs) and corresponding 95% confidence intervals (CIs). Mean differences and standard deviations were extracted for continuous outcomes. Data was collected on number of events with complications, postoperative pain,
aesthetic satisfaction and root sensitivity.

Two reviewers independently extracted data. Any disagreements were resolved by discussion. Authors were contacted for missing data.

**Methods of synthesis**

The pooled odds ratios and 95% CIs were calculated for the dichotomous outcome (complete root coverage). Mean differences and 95% CIs for continuous outcomes were calculated using random-effects models. Results of split-mouth and parallel group studies were combined using the generic inverse variance method. Statistical heterogeneity was assessed using the Cochran Q and I² statistic. Sensitivity analyses were undertaken to investigate the effect of study quality on complete root coverage.

**Results of the review**

Twenty-five RCTs (27 reports) (n=530 patients, 794 recessions) were included in the review: 18 intra-individual (split-mouth design) RCTs (n=348) and seven parallel group RCTs (n=182). Most studies were categorised as high risk of bias.

**Complete root coverage**: Of the five comparisons (10 studies) where CAF was considered as the control surgical procedure, better results were provided in favour of CAF and connective tissue graft (OR 2.49, 95% CI 1.10 to 5.68; two RCTs) and CAF and enamel matrix derivative (OR 3.89, 95% CI 1.59 to 9.50; four RCTs).

**Secondary outcomes**: Mixed results were reported for the various combinations for the outcomes of recession reduction (RecRed), clinical attachment level gain, keratinized tissue gain, root sensitivity, aesthetic satisfaction and postoperative pain and complications.

**Authors’ conclusions**

Connective tissue graft or enamel matrix derivative in conjunction with CAF enhanced the probability of obtaining complete root coverage in Miller Class I and II single gingival recessions.

**CRD commentary**

The review addressed a well-defined question with clear inclusion and exclusion criteria. Several relevant sources were searched for published and unpublished trials without language restriction. Steps were taken to minimise error and bias in the review process, but it was unclear how any disagreements in study selection were resolved. Appropriate criteria were used to assess the quality of included studies and the results were used in the sensitivity analysis. Relevant characteristics of included studies were reported. Appropriate statistical techniques were used to combine study results and assess for heterogeneity. Narrative synthesis was applied where data were few and heterogeneous. This was generally a well-conducted review. The authors’ conclusions reflected the evidence presented and are reliable.

**Implications of the review for practice and research**

**Practice**: The authors did not state any implications for practice.

**Research**: The authors stated that further adequately powered RCTs should assess possible interactions between prognostic factors (such as baseline recession and baseline keratinized tissue) and the surgical procedures. They suggested that such studies should follow CONSORT guidelines (to minimise bias) and include patient satisfaction as a treatment outcome.

**Funding**

Self-funded by the authors and their institution (University of Florence, Italy).

**Bibliographic details**

Cairo F, Pagliaro U, Nieri M. Treatment of gingival recession with coronally advanced flap procedures: a systematic

PubMedID
18724847

DOI
10.1111/j.1600-051X.2008.01267.x

Original Paper URL
http://onlinelibrary.wiley.com/journal/121388294/abstract

Indexing Status
Subject indexing assigned by NLM

MeSH
Biocompatible Materials /therapeutic use; Biological Factors /therapeutic use; Collagen /therapeutic use; Connective Tissue /transplantation; Dental Enamel Proteins /therapeutic use; Gingiva /transplantation; Gingival Recession /surgery; Humans; Membranes, Artificial; Platelet-Rich Plasma; Surgical Flaps; Tissue Engineering

AccessionNumber
12009104114

Date bibliographic record published
09/09/2009

Date abstract record published
03/02/2010

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.