Can subepithelial connective tissue grafts be considered the gold standard procedure in the treatment of Miller Class I and II recession-type defects?

Chambrone L, Chambrone D, Pustiglioni FE, Chambrone LA, Lima LA

CRD summary
This review found that subepithelial connective tissue grafts provided substantial root coverage, clinical attachment, and keratinised tissue gain, and should be the gold standard treatment for recession-type defects. In view of limitations in the review, including the poor quality of trials, unexplained statistical heterogeneity, and the large number of comparisons reported, the authors’ conclusions do not appear to be reliable.

Authors’ objectives
To evaluate the use of subepithelial connective tissue grafts (SCTG) for recession-type defects.

Searching
MEDLINE, EMBASE, the Cochrane Central Register of Controlled Trials (CENTRAL), and the Cochrane Oral Health Group’s Trials Register were searched up to December 2007. The Journal of Periodontology, Journal of Clinical Periodontology, and International Journal of Periodontics and Restorative Dentistry were handsearched. Search terms were reported. The search was limited to papers and abstracts published in English-language journals.

Study selection
Randomised controlled trials (RCTs), of at least six months’ duration, comparing SCTG versus other methods for treating recession-type defects, were eligible for inclusion. The recession areas treated were required to be Miller Class I or Class II, of at least two millimetres (mm), and without caries and restorations. Trials were required to include at least 10 participants per group in the final examination. Outcomes of interest were the changes in gingival recession, clinical attachment level, keratinised tissue, percentage of sites with complete root coverage, patient satisfaction with aesthetic condition, patient preference, adverse effects, and postoperative complications.

The age of participants in the included trials ranged from 16 to 67 years. Most trials were predominantly of women. SCTG was compared with 10 other procedures that included acellular dermal matrix graft, coronally advanced flap, and guided tissue regeneration (GTR) with resorbable or non-resorbable membrane. Some trials compared different SCTG techniques. A large number of comparisons and outcomes were reported. Most of the trials were set in university dental clinics and were of six months’ duration (range six to 60 months).

Two reviewers independently selected the trials and disagreements were resolved by discussion with a third reviewer.

Assessment of study quality
The following components of trial validity were assessed, as adequate, inadequate or unclear: method of randomisation, allocation concealment, blinding of assessment, and reporting of follow-up rate. Trials were rated according to their risk of bias as low risk (all criteria were met), moderate risk (one or more criteria were only partly met), or high risk (one or more criteria were not met). Two reviewers independently assessed trial validity.

Data extraction
The data were grouped by type of intervention. Odds ratios were extracted or calculated for dichotomous data and mean differences for continuous data, with 95% confidence intervals. Variance was estimated using imputation methods, where necessary. Descriptive data were extracted for patient-reported outcomes and adverse effects.

Two reviewers independently extracted the data and excluded any on which they could not reach agreement. Trial authors were contacted for more information if required.

Methods of synthesis
Trials were combined to calculate pooled odds ratios and weighted mean differences with 95% confidence intervals, using random-effects models. Statistical heterogeneity was assessed using the Q and I² statistics. Descriptive data were combined in a narrative synthesis.

**Results of the review**

Twenty-three RCTs (n=554 participants, range 10 to 70) were included in the review. Fifteen used a split-mouth design. Two were judged to be at low risk of bias and 15 at high risk. Seventeen trials described an appropriate method of randomisation, two described adequate allocation concealment, 12 blinded the assessors to allocation, and all reported withdrawal rates.

The reduction in gingival recession was significantly greater with subepithelial connective tissue grafts (SCTG) than with acellular dermal matrix grafts (WMD -0.63mm, 95% CI -1.26 to 0.00; three RCTs; I²=52.5%) or resorbable guided tissue regeneration (GTR; WMD -0.41mm, 95% CI -0.62 to -0.20; seven RCTs).

The increase in width of keratinised tissue was significantly greater with SCTG than with resorbable GTR (WMD 1.46mm, 95% CI 0.81 to 2.12; seven RCTs; I²=84.9%); non-resorbable GTR (WMD 1.82mm, 95% CI 0.35 to 3.28; two RCTs, I²=88.7%); and resorbable GTR with bone substitutes (WMD 2.10mm, 95% CI 1.69 to 2.51; two RCTs).

The rates of root coverage associated with SCTG ranged from 8.6% to 96.1% for complete coverage and from 64.5% to 97.3% for mean coverage (23 RCTs). Resorbable GTR resulted in significantly fewer sites with complete root coverage than SCTG (OR 0.47, 95% CI 0.24 to 0.90; two RCTs).

There were no significant differences in clinical attachment level between SCTG and any comparator. Other meta-analyses had no statistically significant findings. Other outcomes included changes in aesthetic condition and adverse effects.

**Authors’ conclusions**

SCTG provided substantial root coverage, clinical attachment, and keratinised tissue gain and could be considered to be the gold standard for treatment of recession-type defects.

**CRD commentary**

The objectives and inclusion criteria were clear and relevant sources were searched for trials. The restrictions on language and publication status meant that the review was at risk of language and publication biases. It did not appear that publication bias was formally assessed. Steps were taken to minimise the risk of reviewer bias and error, by having more than one reviewer independently select trials, assess their validity, and extract the data. Appropriate techniques were used to combine the data and to assess statistical heterogeneity, but where heterogeneity was detected, it was not explored further. A large number of comparisons and outcomes were reported, with no indication of which outcomes were the most important, as no primary outcome was specified. Few findings were statistically significant and some analyses had substantial heterogeneity. Most of the included trials were small and of poor quality. All of these factors make it difficult to interpret the overall findings.

The authors’ conclusion that SCTG was superior to other interventions does not appear to be justified, based on the inconclusive evidence presented. In view of limitations in the review, including the poor quality of the trials, unexplained heterogeneity, and the large number of comparisons reported, the authors’ conclusions do not appear to be reliable.

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

**Practice:** The authors stated that SCTG could be regarded as the gold standard for recession-type defects, but that other procedures also improved gingival recession, clinical attachment, and width of keratinised tissue.

**Research:** The authors stated that well-designed blinded RCTs, with over a year of follow-up, were required to compare SCTG with coronally advanced flap. These trials should measure patient-related outcomes (e.g. preferences and pain), as well as changes from baseline (e.g. in gingival recession).
Funding
Not stated.

Bibliographic details
Chambrone L, Chambrone D, Pustiglioni FE, Chambrone LA, Lima LA. Can subepithelial connective tissue grafts be considered the gold standard procedure in the treatment of Miller Class I and II recession-type defects? Journal of Dentistry 2008; 36(9): 659-671

PubMedID
18584934

DOI
10.1016/j.jdent.2008.05.007

Original Paper URL
http://dx.doi.org/10.1016/j.jdent.2008.05.007

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Collagen /therapeutic use; Connective Tissue /transplantation; Gingival Recession /surgery; Gingivoplasty /methods; Guided Tissue Regeneration, Periodontal; Humans; Randomized Controlled Trials as Topic; Reference Standards; Skin, Artificial

AccessionNumber
12009103775

Date abstract record published
24/06/2009

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.