

To cord or not to cord? That is still a question

Abstracted from

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Efficiency of Cordless Versus Cord Techniques of Gingival Retraction: A Systematic Review. *J Prosthodont* 2015; doi: 10.1111/jopr.12352. [Epub ahead of print] PubMed PMID: 26378615.

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Question: Corded or cordless techniques for haemostasis and gingival displacement during restorative treatment?

Data sources A broad computerised search with similar key terms was performed in different databases that included: Ovid Medline, Thomson's ISI Web of Science, PubMed, Science Direct, EMBASE and the Cochrane Library. Grey literature, dissertations, abstracts and theses were searched too. Reference lists of the selected articles were hand-searched.

Study selection The inclusion criteria included *in vivo* randomised clinical trials and quasi-randomised clinical trials using gingival retraction techniques with and without cord. Studies were included if they examined the primary outcome from the review: efficiency of haemostasis control, the amount of gingival displacement and the influence of the techniques on gingival/periodontal health. Secondary outcomes accepted for the review included subjective factors reported by the patient such as pain, sensitivity, unpleasant taste and discomfort and operator's experience with both techniques. Non-English papers, clinical reports, animals studies or *in vitro* studies were excluded.

Data extraction and synthesis Two authors independently searched and screened the articles. Disagreements were resolved by discussion. A third reviewer participated in the eligibility of the studies. The risk of bias was assessed using the Cochrane Collaboration tool. Due to the heterogeneity of measurement variables across the studies and the differences among the studies, a meta-analysis was not performed. A narrative assessment was performed for the outcomes: moisture/bleeding control, gingival displacement, gingival/periodontal health and the subjective outcomes.

Results From the initial search that retrieved 1,342 articles, 19 potential relevant full-text articles were considered for the review. Seven studies were selected for the systematic review. Four randomised clinical trials were included. Sample size ranged from eight to 252 participants per study. Five studies were conducted on patients requiring any indirect fixed restorations on prepared teeth. Two studies were done on unprepared teeth. In all studies, participants were in good health, had a healthy gingival condition and a sound periodontal status.

Conclusions Both techniques are reliable in achieving gingival retraction. The review supports the observation that gingival retraction paste can more effectively help to achieve a dry field and at the same time be less injurious to soft tissues, however its ability to displace

gingival tissues, compared to retraction cord, was compromising. Rather than considering the cost of material or the individual preference of the operator, choosing the right technique to maximise clinical efficiency should be based on scientific evidence. It seems that impregnated gingival cords are more effective on thick gingival tissue whereas paste is more effective when minimal retraction is required for haemostasis control, preservation of the gingiva and less tissue displacement.

Commentary

Gingival retraction has been advocated in dentistry as a necessary technique to use to produce a neat environment for accurate dental impressions, with the purpose to control bleeding and remove unwanted gingival tissue, especially for subgingival crown margins.

The retraction methods included different techniques which used mechanical, chemical, chemomechanical and surgical procedures.

What is also known is that the technique ideally should retract the tissues momentarily and as atraumatically as possible.

Mechanical techniques such as retraction cords which were addressed by the review are inexpensive, but by themselves are not good for haemostasis, could be time-consuming and painful for the patients.¹ Chemical products were added to the retraction cords to help to control the haemostasis, such as epinephrine, with the disadvantage of producing unwanted systemic side effects such as increased blood pressure and tachycardia, and it is suggested they be avoided in patients with cardiovascular diseases.^{1,2}

Aluminum sulphate, potassium sulphate, ferric sulphate and aluminum chloride were incorporated into the retraction cords to help achieve haemostasis since they do not produce the systemic side effects of epinephrine, however, the high concentration of such chemical products on the gingival tissue may still produce unwanted side effects such as irritation, tissue decolouration, acidic taste and even interfere in the setting of some impressions materials. All the cord techniques may be dreaded due to manipulation by practitioners and may be uncomfortable for patients.¹

Lasers, electrosurgery and rotary curettage are also a possibility for gingival retraction and are good for removal of excess tissue. However, the risk of potential epithelium damage needs to be considered.

Gingival retraction paste systems have been introduced to reduce the drawbacks of cord techniques and claim to be less traumatic for patients and more efficient for practitioners.

The systematic review focuses on the question to assess the cord and cordless techniques with a vast search that only included English articles.

The seven articles included have an acceptable overall risk of bias (except the three non-randomised clinical trials that were included).

That the results were presented as a narrative assessment due to the variability of the studies reinforces what we already know about gingival displacement and gingival periodontal health as being less traumatic with paste than the cord technique. The paste is more comfortable for patients. Both techniques are good for gingival displacement.

Without actual data it is difficult to assess the effectiveness and the magnitude of the effects of techniques compared to one another.

A systematic review with a meta-analysis published in Chinese in the *Shanghai Journal of Stomatology* in 2013,³ assessing the efficacy of retraction paste versus retraction cord with regard to gingival health, tooth preparation and clarity of the impression, included

nine randomised clinical trials (evaluated by the authors as having a moderate risk of bias.) The results presented in a meta-analysis show that gingival retraction paste has a better effect on gingival health (RR = 1.05, 95% CI 1.00-1.11) p value 0.04.

Gingival retraction is needed for tissue management in restorative dentistry.

Based on the available evidence, it remains the practitioner's judgment of the selection of the material used for that purpose.

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