

Deep Margin Elevation: A Modern Practice to Succeed Posterior Adhesive Restorations

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Background

Minimally invasive dentistry and adhesive dental restorations have changed the therapeutic options to restore posterior molars. Nowadays, to avoid useless teeth preparations and respond to the increasing aesthetic demands, the indication of resin or ceramic inlays and onlays is rising. However, the indication of this kind of restorations is restricted to small supragingival cavities. Therefore a severe decay or substance loss causing subgingival margins may be a real challenge to practitioners [2].

Elderton (1988) and Simonsen (1991) described the restorative cycle of death of the tooth. A tooth restoration fail leads to a larger restoration to restore the first defect, which leads itself to a bigger restoration and even an eventual root canal treatment. Thus, to avoid this restorative circle that may even lead to tooth loss, minimally invasive procedures must be considered to minimize the tooth substance loss and maintain pulp vitality. The most described indirect minimally invasive restorations are then ceramic or resin inlays and onlays [7].

However, cavities with deep cervical margins raise the issue of biological width, practitioners classically solve this problem by crown lengthening, either surgically or orthodontically [14].

To make the clinical procedures simpler and less fault-prone, Dietschi and Spreafico in 1998 introduced a technique named “cervical margin relocation”.

This concept suggests the application of a layer of composite in the deepest parts of the proximal areas in order to relocate the cervical margin supragingivally [11].

Standards of the technique

The cervical margin relocation technique is achieved by placing multiple layers of composite 1mm thick.

First, the rubber dam is placed. The margin limit of the tooth must be accessible to the practitioner to put the resin. A curved matrix should be used to isolate the tooth above the cemento-enamel junction. After that, the tooth proximal box is etched, an adhesive layer is also applied and light cured for 10 seconds. The margin limits are elevated with the resin application and light cured. A bitewing radiograph is finally conducted to evaluate the adaptation of resin composite in the gingival area [8].

Traditional or flowable resins are the most used materials as reported in several studies. However several other materials are also described; such as conventional or reinforced glass ionomers or resin cement [11].

Most of the studies concluded that resin composites are the best materials for CMR regarding the quality of the marginal seal, Traditional composites showed better result when used in 2 or 3 layers rather than just one layer [10].

Effects of the cervical margin relocation on dental tissues

No differences existed in marginal quality of the restorations placed directly on dentin or on marginal relocation in terms of caries development.

The cervical margin elevation does not seem to impact fracture behaviour of the tooth. Moreover, fracture behaviour of endodontically treated molars did not differ significantly between teeth with and without CMR [9].

CMR was found to significantly deteriorate the integration at enamel and dentin margins. It did not result in inferior marginal quality, regardless of the materials tested.

Effects of the cervical margin relocation on periodontal tissues

The use of resin composite or glass ionomer in a deep margin location doesn't seem to deteriorate the integrity of the periodontal tissues. The cervical margin elevation seems to be well tolerated by surrounding tissues.

Although, according to several studies, increased bleeding on probing scores were reported.

However Gingival Index and Plaque Index were not significantly different between posterior teeth with Proximal box elevation or inlays directly bonded to tooth tissue [4, 5].

Cervical margin relocation or crown lengthening?

According to recent studies crown lengthening and cervical margin relocation have both considerable success rate.

It is undeniable that crown lengthening is the old standard technique to elevate deeply located margins, nevertheless, its indications is decreasing in favour of cervical margin elevation, a minimally invasive technique that increases the patient's chances to benefit of adhesive aesthetic posterior restorations [2, 11].

Conclusion

The CMR technique has its place as minimally invasive procedure that goes well with aesthetic restorative materials such as Ceramics and Composites, which makes it very appealing.

It also may be an alternative to surgical crown lengthening when clinical parameters are in favour of this minimally invasive technique, yet it cannot definitely replace it.

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