

# Treatment of Gingival Recessions Associated to Cervical Abrasion Lesions with Subepithelial Connective Tissue Graft: A Case Report

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## ABSTRACT

Extensive gingival recessions associated with cervical abrasions are common among the population. Several different surgical and/or restorative therapies have been proposed to correct these lesions. This manuscript reports the treatment of multiple gingival recessions associated to cervical abrasions. The procedure involved the utilization of subepithelial connective tissue graft (SCTG) combined with coronally advanced flap onto a previously restored root surface. At the postoperative follow-up visits, the success of the restorative/surgical approach was confirmed by the absence of bleeding to probing and periodontal pockets as well as presence of gingival tissue with normal color, texture and contouring. After 18 months of follow-up, the clinical conditions are stable with satisfactory root coverage and periodontal health. An excellent esthetical outcome was achieved and the patient is satisfied with case resolution. (Eur J Dent 2009;3:318-323)

Key words: Periodontal healing; Periodontal regeneration; Restoration; Dental materials.

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## INTRODUCTION

Gingival recession is defined as the displacement of the gingival margin apical to the cemento-enamel junction (CEJ) and may involve one or more tooth surfaces. Causative factors include periodontal disease, mechanical action of aggressive toothbrushing,<sup>1,2</sup> uncontrolled orthodontic movement,<sup>3</sup> improper restoration, tooth malposition and frenum pull. Root exposure resulting from gingival recession leads to tooth sensitivity, root abrasion, chemical erosion, root caries and adverse esthetics.<sup>4</sup> In many instances, cervical lesions involve both the crown and the exposed root causing the disappearance of the anatomic cemento-enamel junction.<sup>5</sup>

Extensive gingival recessions associated with deep caries or cervical abrasions caused by incorrect toothbrushing are commonly observed in dental practice. In these cases, complete coverage by traditional mucogingival surgical techniques might be contraindicated because of the need for extensive root planning, which could compromise the tooth.<sup>6,7</sup> The combination of an adhesive restorative material and surgical coverage might be a solution.<sup>8</sup>

Dragoo<sup>9</sup> observed that subgingival sites in patients with large root lesions restored with resin-modified glass ionomer materials presented clinically healthy periodontal tissues well adapted to root surface with no bleeding on probing and minimum sulcus depth. Histologically, this author observed adhesion of fibroblasts and connective tissue to the restorations.

Alkan et al<sup>10</sup> have obtained good clinical outcomes after placement of a subepithelial connective tissue graft (SCTG) on a resin-modified glass ionomer-restored root surface to treat a localized gingival recession. These authors reported a reduction in the probing depth and absence of clinical signs of inflammation. The occurrence of creeping attachment on the restoration was observed at the monthly periodontal controls.

Recent studies<sup>11,12</sup> have been reported in the dental literature with clinical and histological successful results investigating different restorative materials (resin-modified glass ionomer or microfilled resin composite) that could be used on exposed root surfaces affected by deep caries or cervical abrasions before surgical coverage.

The aim of this paper was reports the use of subepithelial connective tissue graft (SCTG) technique combined with coronally advanced flap onto resin composite restored root surface to treat multiple and adjacent gingival recessions associated to deep cervical abrasions.

## CASE REPORT

A 56-year-old Caucasian male was referred to a periodontics specialist complaining of the un-aesthetic appearance of his maxillary right teeth. During the clinical exam, it was noted the presence of multiple and adjacent Miller's class I<sup>13</sup> gingival recessions in teeth #13 and #15 and Miller's class II<sup>13</sup> gingival recessions in teeth #14 and #16. In teeth #14, #15 and #16, gingival recessions

were associated to 2-mm deep cervical abrasions. The cervical lesions were present on both root and enamel (Figure 1). The teeth presented shallow probing depth with bleeding on probing. The possible etiology was considered incorrect toothbrushing technique.

The patient was first submitted to initial preparation comprising scaling, root planning and oral hygiene instructions. After four weeks, the deep cervical abrasions were restored. For the restorative procedure, isolation was carried out using a rubber dam. Dentin and enamel were etched using 35% phosphoric acid gel for 15 and 30 seconds respectively, rinsed for 30 seconds, and the excess moisture blotted. Cavities were filled with a simplified adhesive system (Single Bond, 3M ESPE), applied according to the manufacturer's instructions and with a microfilled resin composite (Durafill VS, Heraeus Kulzer, Armonk, NY) (Figure 2a). Ten days after the restorative procedure, the surgical procedure for coverage of the exposed roots was performed using SCTG associated with coronally advanced flap. After antisepsis and anesthesia, an intrasulcular incision was made from tooth #14 through tooth #17 and a vertical incision was made mesially to tooth #14, followed by partial-thickness flap reflection. In tooth #13 a tunnel division was performed from the vertical incision on the mesial side of tooth #14 and intrasulcular incision on tooth #13, preserving the interdental papilla (Figure 2b). The exposed root surfaces were scaled and planned. The resin composite restorations were carefully polished and smoothed using a tapered, multifluted, carbide finishing bur under abundant saline solution irrigation. Final contouring and finishing were accomplished with progressively finer grit aluminum oxide disks.

An autogenous connective tissue graft from the palate was obtained according to technique proposed by Bosco and Bosco.<sup>14</sup> Using vycril 5.0 sutures the SCTG was tunneled on tooth #13 and sutured on the distal region of tooth #12. In the region of teeth #14 to #16 the SCTG was stabilized with compressive suture covering part of restored roots (Figure 2c). Therefore, the flap was advanced coronally to the SCTG, covering it completely, and secured with simple interrupted sutures and Y-shaped suspensory sutures. The vertical incision was closed with simple interrupted sutures (Figure 2d). The surgical sites were then covered with periodontal dressing.

After surgery, the patient received pain control medication (paracetamol 750 mg every 6 hours) when needed, antibiotic (amoxicillin 500 mg every 8 hours during 7 days) and chemical plaque control (0.12% chlorhexidine gluconate rinse - every 12 hours for 14 days). The periodontal dressing was changed after 7 days and was removed together with the sutures the 14<sup>th</sup> postoperative day. The patient was maintained under professional supervision for oral hygiene control.

Clinical measurements, including gingival recession height, probing depth and bleeding to probing, were recorded during the preoperative clinical examination and at 2, 8 and 18 months postoperatively. Two months after the procedure, the patient reported to be completely satisfied with the esthetical outcome. No periodontal pockets or bleeding to probing were observed within this period (Figure 3a). At 8 (Figure 3b) and 18 (Figure 3c) months after the procedure, the periodontal tissues presented normal color, texture and contouring. Additional root coverage had occurred between 8 and 18 months as a result of creeping attachment. In addition, satisfactory root coverage was observed from tooth #13 to tooth #16, with no periodontal pockets and/or bleeding to probing.

## DISCUSSION

The success of surgical procedures for root coverage depends on several factors, such as elimination and/or control of the etiology of gingival recession,<sup>15</sup> evaluation of the interproximal bone level and choice for the most appropriate surgical technique, which are inherent to each

clinical situation and region to be treated.<sup>16</sup>

The soft tissue root coverage techniques may be contraindicated for root surfaces where the cavity preparation and/or cervical abrasion exceeds a depth of 1.0 to 3.0 mm.<sup>6,7</sup> Procedures that move soft tissues coronally inside abrasion regions may hinder the patient's plaque control and may make the restorative procedure more difficult, especially achieving a correct marginal fit and emergency profile of the composite restoration. On the other hand, restoration of cervical abrasion, by itself, cannot solve the patient's esthetical problem caused by the excessive length of the tooth.<sup>5</sup> Thus, the choice between restorations alone or combination of composite restoration with soft tissue root coverage is up to the clinician.<sup>8</sup>

In the present case, gingival recession associated with deep cervical abrasion lesions were found to be a complex clinical situation. The choice for covering the exposed roots with a combination of restorative and surgical procedures was based on the fact that the depth of the cervical abrasions (approximately 2 mm) would not allow an adequate root planning. In addition, at the beginning of the treatment, the patient received instructions on how to brush his teeth without causing damage to the periodontal tissues and root surfaces. These instructions were reviewed and reinforced at each treatment and follow-up appointment. Camargo et al<sup>7</sup> related an intense plaque control using a correct toothbrushing technique with non-excessive force is important to the maintenance of the long-term health in areas submitted to root coverage associated to restorative procedures.

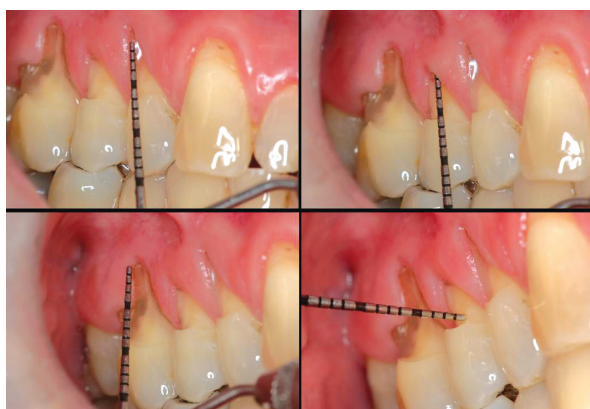


Figure 1. Preoperative clinical photograph showing multiple and adjacent gingival recessions associated with deep cervical abrasions in teeth #14, #15 and #16 caused by toothbrushing trauma.

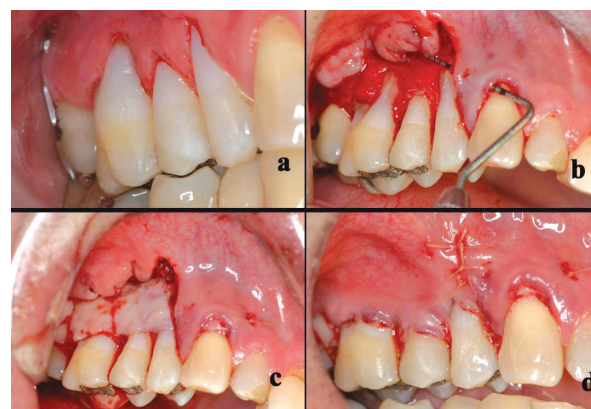


Figure 2. a) Deep cervical abrasions restored with microfilled resin composite; b) Partial thickness flap reflected from the distal of tooth #13 to the mesial of tooth #17; c) Subepithelial connective tissue graft positioned and sutured to the recipient site; d) Coronally sutured flap.

The use of adhesive restorative materials has been proved a biocompatible alternative for restoration of deep caries or cervical abrasion prior to surgical root coverage. The response of periodontal tissue to adhesive restorative materials has been studied by a number of investigators. Larato<sup>17</sup> has demonstrated that the roughness and subgingival position of acrylic resin restoration have been shown to be key factors in the development of gingival inflammation. Van Dijken and Sjöström<sup>18</sup> have reported that sites restored with resin-modified glass ionomer cements, compomers and resin composite were associated with greater amounts of gingival crevicular fluid compared to unrestored sites. However, no statistically significant difference was found between restored and non-restored areas with respect to the gingival index and plaque index.

Konradsson and Van Dijken,<sup>19</sup> analyzed interleukin-1 levels in the gingival crevicular fluid adjacent to subgingival restorations of calcium aluminate cement, resin composite and enamel and concluded that the restorations per se did not alter gingival health nor did they significantly affect interleukin-1 levels or induce gingival inflammation. In the present case, at 2-, 8- and 18-month postoperative controls, the periodontal tissues were healthy, showing normal color, texture and contouring and absence of periodontal pockets or bleeding on probing. There was also a significant esthetic improvement, as the patient desired.

Martins et al,<sup>11</sup> analyzed the histological response of periodontal tissues to subgingival class V resin composite and resin-modified glass ionomer cement restorations and observed biocompatibility of all tested restorative materials. The formation of a long junctional epithelium was the predominant type of healing, with absence of connective tissue attachment and new bone formation onto the restorative materials.

Another study<sup>20</sup> evaluated the periodontal response to the placement of subgingival amalgam and resin-modified glass ionomer cement restorations in dogs' teeth. It was observed that the inflammatory infiltrate associated with amalgam restorations was more intense than that associated to resin-modified glass ionomer cement restorations. Bacteria biofilm control minimized the inflammatory response in most restored sites.

A recent clinical study<sup>21</sup> evaluated the treatment of gingival recessions associated with cervical abrasions with resin-modified glass ionomer cement or microfilled resin composite combined with coronally advanced flap. After six months, the authors observed maintenance of root coverage with no damage to the periodontal tissues.

In the present case, the clinical conditions were stable after 18 months of postoperative follow-up. However, resin composite restorations are always susceptible to physical (occlusal chewing forces, repetitive expansion and contraction stress due to temperature changes) and chemical (dentinal fluid, saliva, food, beverages, and bacterial products) challenges in the oral cavity along time. These challenges acting in the tooth/material interface result in various patterns of degradation of collagen fibrils and resin components.<sup>22</sup> In addition, after continuous exposure to chemical agents, resin-based materials can undergo softening and roughening, making their surfaces more susceptible to the physical forces occurring during abrasion and attrition.<sup>23</sup> Therefore, further longitudinal randomized controlled clinical trials with larger population have to be conducted to evaluate the clinical longevity of adhesive fillings and mucogingival surgery.

In this case report, SCTG was the surgical technique of choice for root coverage. Although this procedure requires a donor site, the choice was based on its high success rate compared to



Figure 3. Postoperative course. a) 2 months; b) 8 months; c) 18 months.



other techniques<sup>8</sup> in sound and decayed teeth either restored or not.<sup>24</sup>

Creeping attachment is known as the postoperative migration of the gingival marginal tissue in a coronal direction over portions of previously denuded root. This phenomenon can be detected 1 to 12 months after graft surgery with an average coverage of ~1 mm. Alkan et al<sup>10</sup> demonstrated that the creeping attachment occurred after SCTG on a glass ionomer-restored root surface. In the present case, it was interesting to observe that creeping attachment occurred on resin composite restored root surface.

In the present case, treatment success was the sum of events that included an optimal polishing and smoothening of the resin composite, patient's commitment and cooperation in maintaining an adequate plaque control and choice for the most appropriate surgical root coverage procedure for this particular case.

## CONCLUSIONS

This single case report indicates that teeth with multiple gingival recessions associated to deep cervical abrasions can be successfully treated by the mucogingival surgery combined with restorative dentistry approach.

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