



Clinical comparison of coronary displaced flap and sub-epithelial connective tissue graft with or without enamel matrix protein derivative for gingival recession coverage. Clinical case presentation

Comparación clínica del uso del colgajo de avance coronal e injerto de tejido conectivo subepitelial con o sin proteínas derivadas de la matriz del esmalte para la cobertura de recesiones gingivales. Caso clínico

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ABSTRACT

The present article described a clinical case where it was assessed whether aggregation of enamel matrix derivative (EMD) to the procedure of coronary-advanced flap with sub-epithelial connective tissue graft (CAF + SCTG) would improve the amount of root coverage in Miller's class I and II gingival recessions when compared to the same isolated procedure in a patient suffering multiple gingival recessions, in a 6 month time-span. Twelve gingival recessions were included in the study: six treated with (CAF + SCTG + EMD) and six treated with (CAF + SCTG) in different quadrants. At beginning of procedure as well as six months later, the following clinical parameters were measured: gingival recession depth (RD), depth to probing (PD), clinical insertion level (CIL) and width of keratinized tissue (KT) in apex-coronary direction. A $p < 0.05$ was considered statistically significant. Results established that after a six month procedure CAF + SCTG + EMD and CAF + SCTG produced significant root coverage, respective averages were 2.83 ± 1.16 mm ($p = 0.001$) and 2.50 ± 0.83 mm ($p = .002$). All gingival recessions treated with EMD experienced 100% root coverage, sites treated with CAF + SCTG + EMD exhibited coverage of only 65.3%. When comparing results at six months, better results were observed with CAF + SCTG + EMD with respect to clinical insertion level ($p = .02$) and root coverage ($p = .06$). Nevertheless, neither the difference of clinical level insertion nor the gain in root coverage resulted significant. Additionally, no significant differences were observed between PD and KT. **Conclusion:** The present clinical case did not show additional benefits when EMD were aggregated to the CAF + SCTG in the coverage of multiple Miller's class I and class II gingival recessions.

Key words: Gingival recession, coronary-advanced flap, connective tissue sub-epithelial graft, enamel matrix derivatives, periodontal regeneration.

Palabras clave: Recesión gingival, colgajo de avance coronal, injerto subepitelial de tejido conectivo, derivado de la matriz del esmalte, regeneración periodontal.

RESUMEN

Se presenta un caso clínico donde se evaluó si la agregación del derivado de la matriz del esmalte (DME) al procedimiento del colgajo de avance coronal con injerto de tejido conectivo subepitelial (CDC + ITCS) mejorarían la cantidad de cobertura radicular en recesiones gingivales clase I y II de Miller comparados con el mismo procedimiento solo, en un paciente con recesiones gingivales múltiples a seis meses. Se incluyeron 12 recesiones gingivales, seis tratadas con (CAC + ITCSE + DME) y seis con (CAC + ITCSE) en diferentes cuadrantes. Al inicio y a los seis meses se midieron los parámetros clínicos tal como profundidad de la recesión gingival (PR), profundidad al sondeo (PS), nivel de inserción clínica (NIC), y ancho de tejido queratinizado en dirección apico-coronal (TQ). Un valor $p < 0.05$ se consideró significativo. Los resultados mostraron que a los seis meses ambos procedimientos, CAC + ITCSE + DME y CAC + ITCSE produjeron una significativa cobertura radicular en promedio 2.83 ± 1.16 mm ($p = 0.001$) y 2.50 ± 0.83 mm ($p = .002$), respectivamente. Todas las recesiones gingivales tratadas con el DME tuvieron el 100% de cobertura radicular y sólo el 65.3% de cobertura para los sitios tratados con CAC + ITCSE. Al comparar ambos procedimientos a los seis meses se observaron mejores resultados con CAC + ITCSE + DME en cuanto al nivel de inserción clínica ($p = .02$) y la cobertura radicular ($p = .06$); sin embargo, la diferencia del nivel de inserción clínico ni la ganancia en la cobertura radicular mostraron ser significativos. Por otro lado, no se observaron diferencias significativas en la PS y TQ. **Conclusión:** El presente caso clínico no mostró beneficio adicional cuando se agregó el DME al procedimiento de CAC + ITCSE para la cobertura de recesiones gingivales múltiples clase I y II de Miller.

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Received: March 2015.

Accepted: April 2015.

This article can be read in its full version in the following page: <http://www.medigraphic.com/facultadodontologiaunam>

VÉASE CONTENIDO RELACIONADO:

<http://dx.doi.org/10.1016/j.rodex.2015.10.009>,

Revista Odontológica Mexicana 2015;19:263-72.

INTRODUCTION

Gingival recession is defined as exposition of a part of the tooth's root due to the displacement of the gingival margin.¹ It is not considered a disease, but rather a defect which prompts the patient to complain about root hypersensitivity,² poor esthetics³ and root caries.⁴ It is a trait frequently found in subjects with suitable or deficient oral hygiene,⁵ it can appear isolated or in several contiguous teeth.⁶

Self-induced trauma due to vigorous brushing is the main etiologic factor in patients with good oral hygiene, it generally appears in the oral surface in young subjects.⁵ In patients with inflammation induced by bacterial plaque, gingival recession mainly affects inter-proximal zones.⁶ Several factors might enhance the presence of gingival recession, such as high muscle insertion, frenum traction and iatrogenic factors related to restorative and periodontal procedures.⁷

Isolated gingival recession or multiple recessions can be treated with periodontal plastic surgery procedures aimed at placing soft tissue grafts to cover root surfaces, to thus restore acceptable esthetics and decrease root sensitivity.^{8,9}

According to Miller's classification of gingival recessions,¹⁰ class I and II gingival recessions are more predictable to achieve root coverage, since in these recessions, inter-proximal tissues remain intact, blood supply for the survival of the graft will be provided from these locations. Success rate is unpredictable for Miller's class II and IV recessions, since there is a loss of inter-proximal tissues which will limit or prevent blood supply to the graft.

Several surgical procedures have been undertaken to achieve root coverage of multiple gingival recessions, among them we can mention coronary-advanced flaps,^{11,12} sub-epithelial connective tissue grafts¹³ connective tissue grafts with tunnel flap,¹⁴ all of which provide different rates of success and predictability.¹⁵ Nevertheless, the procedure involving a coronary-advanced flap combined with sub-epithelial connective tissue graft (CAF + SCTG), can be considered the gold standard, since this procedure exhibits greater root coverage predictability and greater color homogeneity with surrounding tissues.¹⁶

Recently, the use of enamel matrix derivative (EMD) has been applied as clinical treatment to promote periodontal tissues regeneration.^{17,18} It is a derivative from porcine embryonic enamel and is based on the high homology found between human and porcine enamel proteins, since they mimic the sequence of events involved in root cement formation, favoring

thus new insertion of periodontal ligament.^{19,20} This regenerative concept has also been demonstrated when used in root coverage procedures.²¹

Topical EMD application in CAF procedures has exhibited suitable results with respect to root coverage, clinical insertion gain and increase of apex-coronal dimension of keratinized tissue.^{22,23} Nevertheless, other studies could not demonstrate clinical improvement when compared with solely coronal advanced flap.^{24,25} There are a few studies on EMD application along with CAF + SCTG, where contradictory results have equally been found. Better results have been reported in a controlled clinical study in Miller's class I and II²⁶ recessions, as well as in another study conducted on Miller's²⁷ class III recessions, whereas other studies have reported no benefit whatsoever.^{28,29}

The purpose of the present clinical case was to study whether EMD application during coronal-advanced flap procedures with sub-epithelial connective tissue graft (CAF + SCTG) exerted an additional effect on root coverage of Miller's class I and II recessions in a patient afflicted with multiple gingival recessions.

CLINICAL CASE

37 year old female attending the Implantology and Periodontics Clinic at the Graduate and Research School, National School of Dentistry, National University of Mexico (UNAM), due to multiple gingival recessions. She requested coverage of said recessions due to hypersensitivity and esthetic problems. Clinical history did not reveal any systemic condition. During pathological personal history recording, the patient revealed orthodontic treatment with bilateral mandibular orthognatic surgery three years before. Clinical exploration showed Miller's type I, II and III recessions in all quadrants and edge to edge occlusion (*Figure 1*). X-ray examination showed intact inter-proximal bone crests, periodontal examination revealed plaque-induced gingivitis. The patient exhibited a 22% plaque index and bleeding upon probing in 34% of all sites.

The patient was subjected to initial therapy which consisted on oral hygiene advice, calculi removal, tooth polishing, as well as inter-consultation with the Orthodontics Clinic at the same institution in order to correct dental malposition. Three weeks later another assessment was undertaken which revealed a plaque index under 10%.

Surgical treatment plan consisted on root coverage with coronal advanced flap with sub-epithelial connective tissue graft (CAF + SCTG)

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