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AN ALTERNATIVE MANEUVER TO TREAT GINGIVAL RECESSION

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ABSTRACT

This article reports a clinical case in which was applied autologous bone graft associated with subepithelial connective tissue graft, harvested by gingivectomy procedure with technical modifications to increase gingival graft extension, also to be used as guided tissue regeneration, to treat a single gingival recession. After 1 year and 2 months of follow-up, the coverage of the recession was 4.0 mm, which corresponded to the gain of attached keratinized gingival tissue. An increase in the gingival tissue thickness was observed, without significant probing depth. The procedures applied to treat this case may be biologically and clinically useful to treat gingival recession.

KEYWORDS: Case report, connective tissue, esthetics, gingival recession.

1. INTRODUCTION

Gingival recession is defined as apical migration of junctional epithelium, loss of attachment, resorption of alveolar bone, with root surfaces exposure without formation of periodontal pocket. It is prevalent in patients with poor or good plaque control, with or without gingival margins inflammation being always part of periodontal disease process[1]. Its etiology is a complex interaction of bacteria and predisposing risk factors, as: anatomical features, iatrogenic process, emotional conditions, behaviors (habits), traumatic occlusion, mechanical trauma, chemical trauma, tobacco consumption and has been found frequently on buccal surfaces than on other aspects of the teeth[1,2,3].

Gingival recession in its localized or generalized form, often result in non-esthetic condition and exposed root surfaces are prone to abrasion, caries and hypersensitivity[1]. The management of gingival recession, a consequence of periodontal disease progression is based on a thorough assessment of the etiological factors and degree of periodontal tissue involvement[1,4]. Once the etiology of the condition has been uncovered and addressed, the treatment plan to arrest or reverse the gingival recession may be established[4,5].

The treatment plan will be based on the severity of symptoms as dentinary hipersensibility, the future consequence of the lesion as radicular caries and the goal of the patient as esthetic concerns[5]. In this case, the regenerative periodontal procedures as subepithelial connective tissue graft employed as guided tissue regeneration and autogenous bone graft were applied, attempting to gain new clinical attachment, keratinized gingiva, improve bone level, and minimize postoperative gingival recession.

2. CASE REPORT

A 22-year-old female patient was referred to the Periodontology Clinic, São Paulo State University-UNESP, in January 2013, for evaluation and treatment of single recession in the lower left central incisor. Her complaints were esthetics and dental sensitivity. She was non-smoking, presented good systemic health, did not take any medication in the previous 3 months, had no known allergies and brushed his teeth with a soft-bristle toothbrush using horizontal motions.

Figure 1. Gingival recession.

The clinical examination revealed a plaque index of 39%,[6] a gingival index of 18%,[6] and probing depth almost in all teeth ≤ 2 mm however, by lingual side in posterior teeth in the maxilla, the marginal and papillary gingiva appeared enlarged and prominent with probing deep around 4mm, but without attachment loss. Approximately 3 mm of excessive gingival tissue was observed in relation to the cementum-enamel junction. Radiographic evaluation showed no bony defect. Only lower left central incisor displayed evident gingival inflammation with 4 mm of clinical attachment loss (Figure 1).

The lesion was caused by anatomic features (lower left central incisor buccally malpositioned in the arch), associated with traumatic occlusion (Figure 2) [1,2,3]. The traumatic occlusion was treated by adjusting centric position and anterior guidance, to distribute anterior teeth contacts on protrusion movement (Figure 3) [7]. As the marginal tissue recession of lower left central incisor extended to the mucogingival junction and a clear attachment loss and tooth malposition existed, classification of the gingival recession was consistent with class II according to Miller[8]. The patient was given a detailed explanation concerning the procedure, and informed consent was obtained from her. The patient underwent complete root scaling with sonic scaler and oral hygiene instructions[10]. After 1 month, the plaque index was 22%,[6] and the gingival index was 8%; thus, a subepithelial connective tissue graft in association with autologous bone graft was proposed, aiming for root coverage of lower left central incisor[9,10].

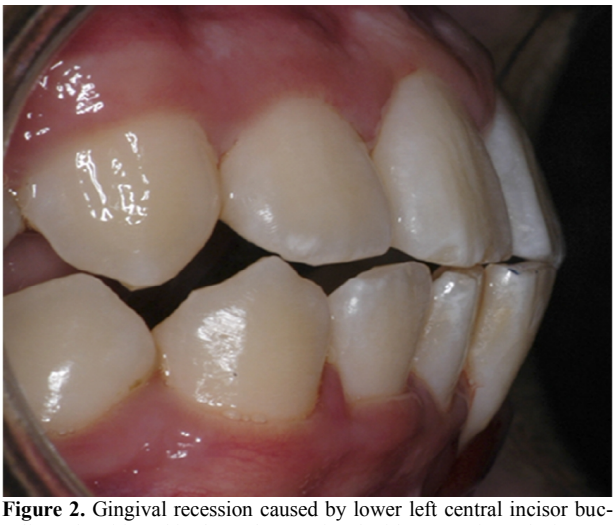

Figure 2. Gingival recession caused by lower left central incisor buccally malpositioned in the arch, associated with traumatic occlusion.

Initially, intra and extra oral antisepsis was carried out using 0.12% chlorhexidine digluconate. Following local anesthesia, the exposed root surfaces were submitted to physical treatment by root scaling with sonic scaler. Then, a sulcular incision was made through the buccal aspect with a 15C scalpel blade, preserving the integrity of the papillae.

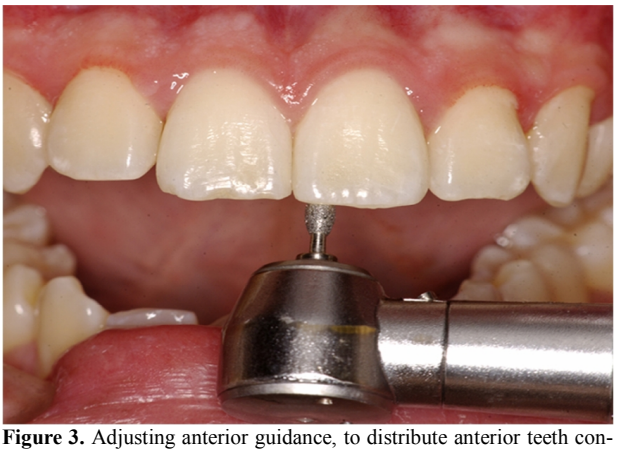

Figure 3. Adjusting anterior guidance, to distribute anterior teeth contacts on protrusion movement.

The incision was initiated in the distal aspect of the lower right lateral incisor and extended to the distal aspect of the lower left central incisor. A vertical incision was performed in the distal aspect of both teeth. The flap was elevated by carefully full-thickness dissection performed with a periosteal elevator. The exposed periodontitis-affected root surface was altered chemistrilly with topical application of tetracycline hydrochloride paste for 4 minutes. To the purposes of demineralization and decontamination, to make it a hospitable substrate to support and encourage migration, proliferation, proper phenotypic expression of periodontal connective tissue progenitor cells and attachment[11,12]. To influence faster bone graft union and incorporation, the bone surrounding root of lower left central incisor was decorticated, to expose bone marrow and endosteum (Figure 4) [13].

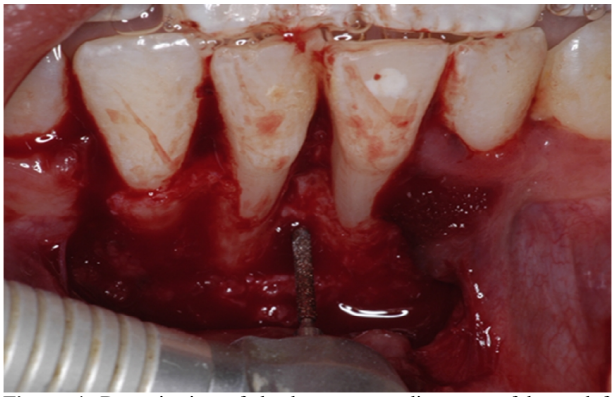

Figure 4. Decortication of the bone-surrounding root of lower left central incisor to expose bone marrow and endosteum.

To harvest a subepithelial connective tissue graft, the area elected was the palatal mucosa that could produce a graft large enough to completely cover the receptor area. On clinical examination, marginal and papillary gingiva by lingual side in the posterior teeth of the maxilla appeared thus far enlarged and prominent, in spite of initial periodontal therapy. Further palatal gingival margin as-

sessment revealed a fibrous and consistent tissue, without bleeding on probing depth. A gingivectomy procedure with technical modifications was planned, to correct gingival contour and improve aesthetics crown lengthening by reducing the amount of gingiva. First, an intra sulcular incision was made through the lingual aspect with a 15C scalpel blade until achieving the bone crest. This incision was initiated in the distal aspect of the upper left first premolar and extended longitudinally to the distal aspect of the upper left first molar, until exposing maxillary tuberosity. A vertical incision was performed in the distal aspect of upper left first premolar. The flap was deflected by carefully full-thickness dissection performed with a periosteal elevator. A straight horizontal releasing incision technique was executed on the level and in the direction of cementoenamel junction, from the distal aspect of upper left second molar until distal aspect of upper left first premolar, to remove excess of gingival tissue which was used as the tissue to be grafted (Fig. 5). After that, the epithelial tissue was removed from the graft by acute dissection to obtain only connective tissue. A scheme was performed to enlarge the extension of the graft to cover completely avascular root surface, with its major extension over adjacent vascularized tissues. For that reason, the connective tissue graft harvested with the maximum thickness was positioned on a sterilized glass plate and immobilized with a sterile spatula. The graft was split cross-sectionally with a 15C scalpel blade; however, it was not divided completely into two parts. After this procedure, the graft had almost twice the length of the initial graft and a thickness around 1.5 mm (Fig. 6). The autologous bone graft was harvested from maxillary tuberosity by using a roungeur (Fig. 7).[12]

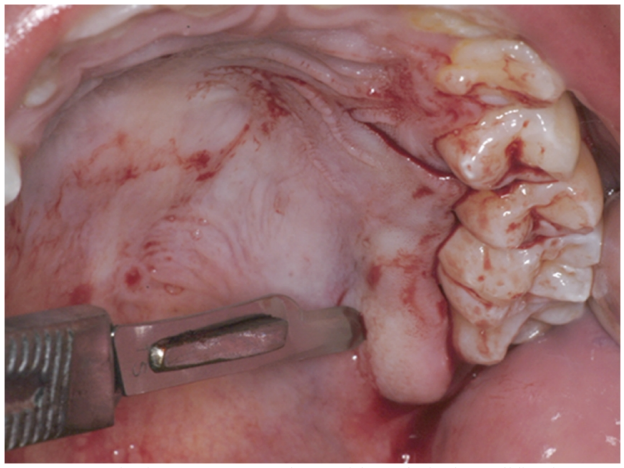

Figure 5. Gingivectomy procedure with technical modifications to harvest connective tissue to be grafted.

The palatal flap was then incised by internal bevel incision and the excess of connective tissue was dissected and the flap was thinned. The excess of connective tissue was not removed; it was dislocated and repositioned coronally, over the crest of alveolar bone. The flap was sutured to hold tissues passively in the position with suspensory 4.0 silk sutures (nonabsorbable organic material: silk black braided, #4-0, cutting needle, P-3, Ethicon, São José dos Campos, SP, Brazil) (Figure 8).

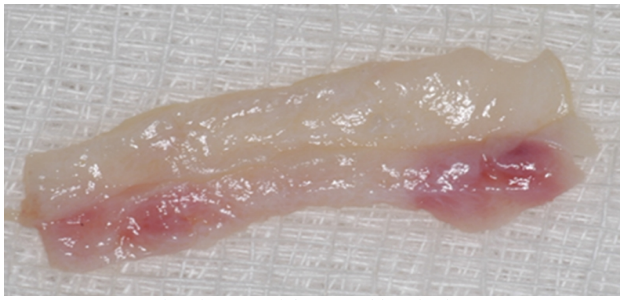

Figure 6. Connective tissue graft harvested by gingivectomy.

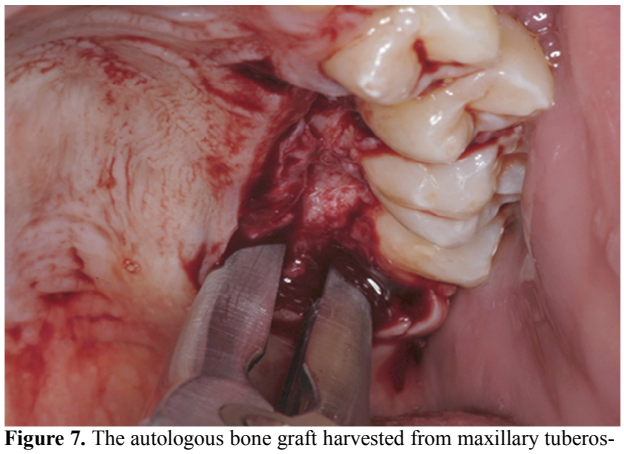

Figure 7. The autologous bone graft harvested from maxillary tuberosity by using a roungeur.

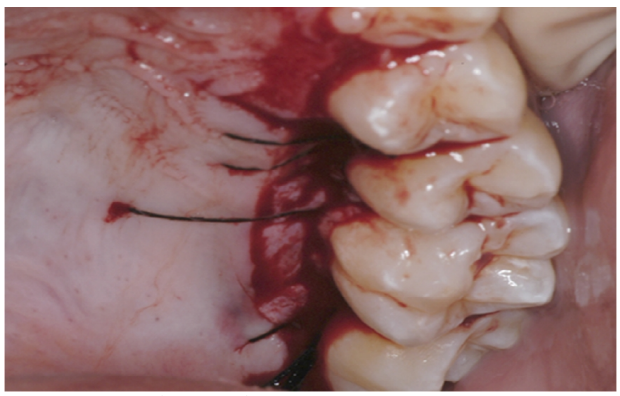

Figure 8. Donor site sutured.

The bone graft is positioned and trimmed on the receptor site and the subepithelial graft was placed and sutured over the grafted bone with suspensory sutures (nonabsorbable synthetic material: nylon black braided, #5-0 cutting needle, P3, Ethicon, São José dos Campos, SP, Brazil). The flap was then sutured to achieve primary closure over the grafted site (Figure 9, 10, 11). A periodontal dressing (Coe Pack GC) was applied over the donor site and on the receptor area.

Figure 9. The bone graft positioned and trimmed on the receptor site.

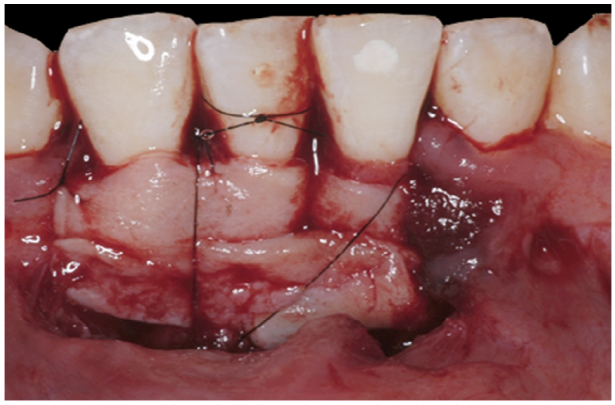

Figure 10. The subepithelial graft was placed and sutured over the grafted bone with suspensory sutures.

Figure 11. The flap sutured over the grafted site.

The patient was instructed to take analgesic medication (acetaminophen, 750 mg, three times a day for 4 days) and to use mouthrinse with 0,12% chlorhexidine digluconate twice daily for 21 days. The periodontal dressing and all sutures were removed after 10 days (Fig. 12). The patient was followed up weekly and monthly up to the third month.

The healing process was uneventful, and the patient did not report pain or discomfort during the overall postoperative period. During the postoperative follow-up, no sign of necrosis or hemorrhage was observed in the donor and receptor areas.

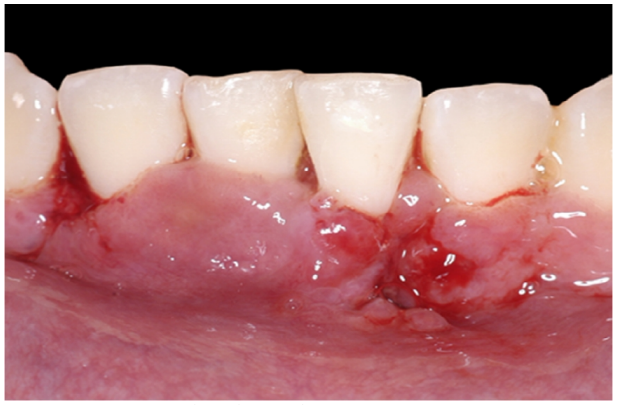

Figure 12. Postoperative after 10 days.

Figure 13. 1 year and 2 months of follow-up.

Figure 14. Donor site 1 year and 2 months of follow-up.

The color of the tissues was nearly homogeneous 3 weeks following the surgical procedure and esthetic improvements were observed 3 months postoperatively and were maintained during 1 year and 2 months of follow-up (Figure 13).

The coverage of the recession was 4.0 mm; this value corresponded to the gain of keratinized tissue. In addition, an increase in the tissue thickness was observed, without significant probing depth. The donor site also was uneventful with marginal gingiva positioned at cementoenamel junction with health aspect (Figure 14).

3. DISCUSSION

The etiology of gingival recession is considered multifactorial, where bacteria are essential, but always needs to be associated with predisposing risk factors to develop the disease[1,2,3,4]. The predisposing risk factor may be an inherent characteristic associated with an increased rate of a subsequently occurring disease, but does not necessarily cause the disease[4]. The gingival recession may cause esthetic concern, dental root sensitivity and radicular caries predisposition[1]. To treat gingival recession, always will be necessary to eliminate or to establish a control in all etiologic factors or improve host local defense against the entire etiologic factors, to promote homeostasis in diseased areas through a long stated period[4]. In this case the etiological factors playing determinant role in the gingival recession development were: bacteria, traumatic occlusion and the tooth buccally malpositionated; an anatomical feature[1,2,3]. To establish bacterial plaque control, the patient underwent complete root scaling and the oral hygiene instructions.

The traumatic occlusion was promoted due buccally malpositioned lower left central incisor. When the mandible was moved into protrusion, the lower left central incisor was aimed anteriorly and first come to contact with the maxillary upper incisor, promoting deleterious contact in mandibular eccentric movement[7]. Posterior centric contact was checked out and an occlusal adjustment was carried out, because premature contact in centric position may move the mandibular arch anteriorly, promoting undesirable anterior contact[7]. In the sequence, the lingual face of upper incisor was adjusted to distribute anterior teeth contacts on protrusion movement.[7] Malposition of lower left central incisor also may induce alterations in the widths of the keratinized and attached gingiva and a thin bony in buccal aspect, decreasing amount of bone marrow, thus, predisposing bone reabsorption and gingival recession[1,2,3]. When all etiologic factors may not be eliminated or controlled, the alternative procedure should be to improve host defense against aggressor agents to establish disease contro[4].

In order to improve local resistance in lower left central incisor, an autogenous bone graft associated with guided tissue regeneration was considered[9,10]. The autogenous bone graft from the maxillary tuberosity is the most viable periodontal bone graft, due presence of hematopoietic tissue and their osteogenic potentials to form the new bone, by processes of osteogenesis, osteoinduction, and osteoconduction[10]. Therefore, the bone graft harvested from maxillary tuberosity was positioned and trimmed on exposed root surface and adjacent decorticated vascularized tissues. A subepithelial graft was used as barrier membranes to direct the growth of new bone, to augment keratinized attached gingival tissue and to recover the root of lower left central incisor[9]. An adequate blood supply from the tissues adjacent to the graft bed seems to be the single most important factor for the survival of grafted tissue[5,9,12,13]. Then, a large extension of the graft to cover completely avascular root surface, with its major extension over adjacent vascularized tissues seem to be important. The method applied to harvest a large connective tissue graft in this case was significant to aid an initial stability of the subepithelial graft on vascularized portion of receptor site, which was decorticated, allowing the revascularization and maintenance of the amount of connective tissue graft during healing process. The subepithelial graft was placed and sutured over the grafted bone, attempting to exclude gingival epithelium interference, guiding only required tissue regeneration, to recuperate diseased root surface by establishing new resistant tissue development as bone, and keratinized attached gingiva[2,3,4,9]. The space created by bone graft may allow easily cells from the periodontal ligament and bone marrow exposed by decortication, to expand blood supply and to populate with mesenchymal stem cells penetration into the bone graft in its early reparative phase[9,10,13]. The release of local growth factors, which would be caused by receptor bed decortication, also has been suggested as one of the factors explaining the hastening of bone graft incorporation process[12,13]. These procedures could induce new bone formation and new connective tissue attachment to the avascularized root surface, preventing epithelial migration and the establishment of the long junctional epithelium until the base of the original periodontal defect[4,12,14]. The gain of keratinized attached gingival tissue and possible bone neoformation, may induce supplementary resistance against the gingival recession recidivism[4]. Then, the goal of treatment was not only to eliminate or to control etiologic factors; application of procedures which could recuperate some lost tissues improving its quality and quantity, may also increase host resistance against aggressor agents, helping to achieve homeostasis in altered area[4]. Another aspect regarding to the biologic mechanism that facilitates healing of lost periodontium by using guided tissue regeneration is attributed to stabilization of the root-clot-graft interface by membrane[12]. In surgical periodontal therapy when periodontal wounds are closed and sutured, one of the wound margins is an avascular and rigid periodontitis-affected and altered root surface and another wound margin is a soft tissue vascular flap margin[12,15]. This detail induces a fibrin clot formation with a fragile initial attachment to the altered root surface, for preventing epithelial down growth and to form a scaffold for development of a cell and collagen fiber attachment mechanism[12,15]. Then, a fibrin clot adherent to the altered root surface is a fragile but vital part of early periodontal wound healing. If this first series of events is disrupted, or if the initial attachment of fibrin or/and immature connective tissue is ruptured, then a pattern of healing including a long junctional epithelium to the base

of the original periodontal defect is expected to occur to prevent infection[12,14,15].

Then, the suture also may be considered as an important factor during regenerative attempts, stabilizing and protecting the root-clot-graft interface in earlier period of wound healing.[12] For this reason, the flap margin was sutured positioned coronally to the cemento-enamel junction, in a manner that could be well stabilized against the tooth, limiting the possibilities of gingival margin movement[12]. The patient is maintained over periodic plaque control supervision, to keep the area clinically health.

4. CONCLUSION

The present clinical results, after 1 year and 2 months of periodic control, show an adequate mucogingival complex in which the mucogingival tissues can sustain their biomorphological integrity and maintain an enduring attachment to the tooth and the underlying alveolar bone, allowing to conclude that the procedures applied to treat this case may be biologically and clinically useful to treat gingival recession.

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