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Case Report

Root Coverage Surgery with Subepithelial Connective Tissue Graft in the Treatment of Gingival Recession: A Clinical Case Report

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Abstract: Gingival recession, a common periodontal condition, occurs when the gingival margin migrates apically to the cementoenamel junction (CEJ), exposing the root and potentially causing dental hypersensitivity, caries, and aesthetic dissatisfaction. Causes include bacterial biofilm, frenulum and frenum insertions, band of keratinized gingiva, gingival phenotype, alveolar morphology, tooth positioning, and mechanical trauma. It is classified into three types: RT1 (no CEJ exposure), RT2 (interproximal loss equal to or less than buccal loss), and RT3 (interproximal loss greater than buccal loss). Among root coverage techniques, the subepithelial connective tissue graft (SCTG) is highlighted for its predictability, color compatibility with adjacent gingival tissue, and good blood supply, reducing the likelihood of necrosis. This qualitative and descriptive study reported a clinical case of root coverage surgery with SCTG in a 60-year-old female patient with Miller class III and Cairo RT2 recessions on teeth 31 and 41. The palate was chosen as the donor site for the graft due to its adequate thickness. The SCTG technique combined with a laterally positioned flap and double papilla was used. The procedure resulted in reduced dentinal hypersensitivity and patient satisfaction with aesthetics, along with an increase in keratinized tissue, despite not achieving total root coverage. The success of the treatment was attributed to the precise indication of the case and professional skill.

Keywords: Periodontology; Gingival recession; Connective tissue.

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1. Introduction

Gingival recession (GR) can be defined as the apical migration of the gingival margin towards the cementoenamel junction (CEJ), resulting in the exposure of the root surface. It can appear in isolation or multiple sites within an arch or both arches, affecting both the buccal and lingual surfaces [1]. The consequences of these recessions can include functional and aesthetic damage to periodontal tissues, such as changes in gingival contour and loss of keratinized mucosa [2, 3]. In most clinical cases, the association of etiological factors results in the multifactorial etiology of gingival recessions [4], with the most frequent being trauma from excessive brushing, periodontal disease, altered tooth positioning, smoking, local factors that promote plaque retention, orthodontic treatment, and defects of the alveolar bone crest [5].

Gingival recessions are classified as gingival deformities around teeth according to the current classification of Periodontal Diseases [6]. They can cause sensitivity, pain, and aesthetic changes in patients [7]. According to Miller's classification, gingival recessions can be divided into four classes: classes I and II have no interproximal bone loss and can achieve total root coverage; class III has mild to moderate interproximal bone loss, where partial root coverage can still be achieved; and class IV has severe proximal bone loss, eliminating any possibility of root coverage [8, 9]. Cairo et al. [1] classified gingival recessions into three types: Type I Recession (RT1) with no interproximal attachment loss and no clinical exposure of the CEJ; Type II Recession (RT2) associated with interproximal attachment loss, where this loss is equal to or less than the buccal loss; and Type III Recession (RT3) related to interproximal attachment loss greater than the buccal loss.

To restore the lost gingival tissue, several surgical techniques have been advocated to eliminate or correct the anatomical defects caused by trauma to the gingiva or alveolar mucosa, gingival recessions, papilla alterations, and the loss of soft tissue thickness and height around teeth and implants. Among these surgical techniques, the main ones include pedicle flaps such as the coronally advanced flap and the laterally positioned flap, with or without subepithelial connective tissue graft (SCTG) [10, 11].

Given these observations, the aim of this paper was to report a clinical case of root coverage surgery with a subepithelial connective tissue graft (SCTG) in Miller class III and Cairo RT2 gingival recessions in the anterior mandibular region.

2. Case Report

A 60-year-old female patient sought treatment at the Fontenele Coutinho Dental Clinic, reporting "sensitivity in the lower teeth and dissatisfaction with her smile." After anamnesis and extraoral clinical examination, the patient was found to be systemically healthy. However, after intraoral clinical examination and simplified periodontal examination, the presence of bleeding on probing and supragingival calculus in the V sextant was noted. Scaling and root planing (SRP), dental prophylaxis, and oral hygiene instructions were performed.

Periodontal probing and photographic images revealed 5 mm gingival recessions compatible with Miller class III and Cairo RT2 on the buccal surfaces of the lower central incisors (teeth 31 and 41), presenting a narrow band of keratinized gingiva, loss of interdental papillae, and a thin gingival phenotype (Figure 1). Given the extensive area of gingival recession on the two teeth and the donor site, the palate exhibited clinically normal characteristics, with sufficient thickness and extension to obtain tissue for covering the exposed root area. The subepithelial connective tissue graft technique associated with a laterally positioned flap and double papilla was chosen.

The patient was informed about the causes and consequences of gingival recession and prevention measures. Factors related to the formation of gingival recession, such as traumatic brushing and inflammation caused by biofilm, were controlled through oral hygiene instruction and adjustment of brushing technique. The preoperative protocol included the prescription of 8 mg Dexamethasone (Decadron®, Ache Laboratórios Farmacêuticos S.A. – Guarulhos – SP) one hour before the surgical procedure to control postoperative edema. The surgical procedure began with the patient's preparation and surgical table setup, and antisepsis was performed. For intraoral disinfection, a 0.12% Chlorhexidine Gluconate solution (PerioGard®, Colgate Palmolive Ltda – Osasco – SP) was provided for mouth rinse, 10 ml for 1 minute. For facial disinfection, 2% Chlorhexidine Digluconate Gel (Riohex 2%®, Rioquímica S/A – São José do Rio Preto - SP) was applied with sterile gauze to the perioral skin.

Next, injectable local anesthesia was administered using 4% Articaine with 1:200,000 Epinephrine (Articain®, DFL – Rio de Janeiro – RJ) through the infiltrative technique in the anterior mandibular region (recipient site). In the donor area, anesthesia was performed on the right greater palatine and nasopalatine nerves, along

with infiltrative anesthesia. The surgical procedure began with the preparation of the recipient site. Using a 15c scalpel blade (Swann Morton Ltd - Sheffield, England®), two semilunar incisions were made around the gingival margin of teeth 32 and 42, preserving a 2mm band of marginal gingiva, and completed with two vertical relaxing incisions extending to the alveolar mucosa (Figure 2).

Figure 1: Preoperative aspect of the lower incisor region presenting a Miller Class III and Cairo RT2 gingival recession, after scaling and root planing (SRP) to prepare the recipient site.

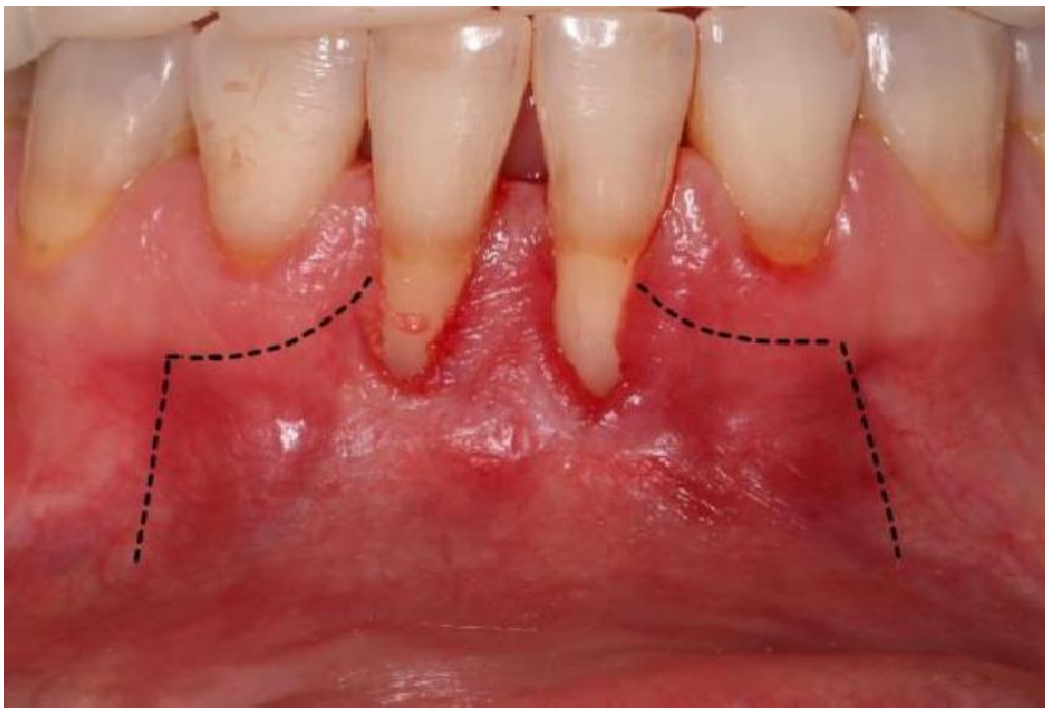

Figure 2: Model of the planning conducted for the surgical procedure in preparation of the recipient site for the graft. Preoperative planning of the patient, showing the performed incisions. Image illustrating the semilunar incisions around the gingival margin of teeth 32 and 42, along with vertical relaxing incisions extending to the alveolar mucosa.

The double papilla flap was moved laterally towards the recessions of the lower central incisors. Using the BW001 micro blade (Micro blade®, MJK LATAM - Château Gombert - France), tunneling of the central papilla of teeth 31 and 41 was performed, extending beyond the mucogingival junction, keeping it intact and attached at the coronal third. The palate was chosen as the donor region, where the graft was removed using the free gingival graft technique, being extraorally de-epithelialized. Two horizontal and two vertical incisions were made, sized to match the recipient area, with a depth of 1.5 mm (Figure 3).

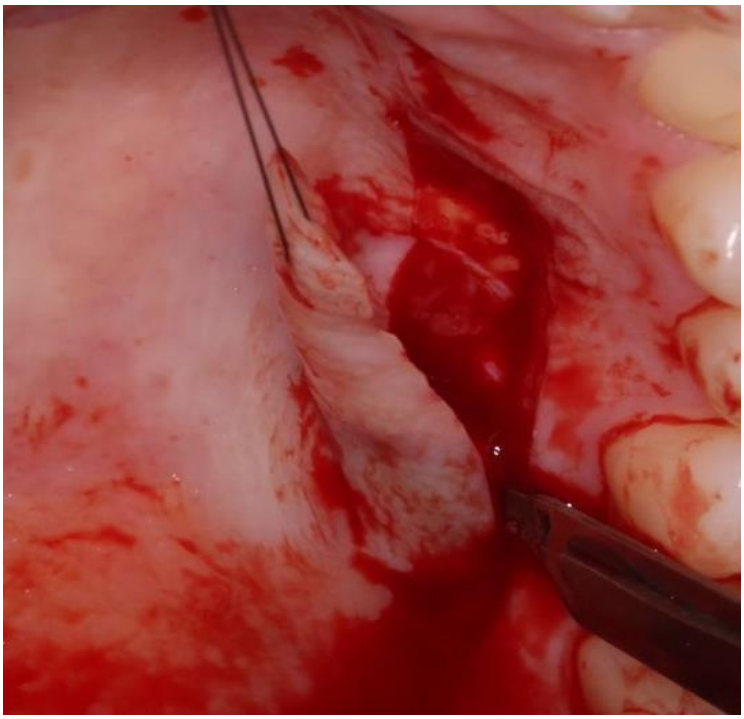

Figure 3: Removal of the graft from the palate. Surgical technique for removing the subepithelial connective tissue graft from the lateral palate with a free gingival graft (FGG).

The graft was placed on a moistened orange Arkansas stone (GOLGRAN® - São Caetano do Sul - SP) with a 0.9% saline solution (Equiplex® - Aparecida de Goiânia - GO). Using a 15c scalpel blade parallel to the graft surface, de-epithelialization and removal of fatty tissue from the connective tissue were performed (Figure 4). Hemostatic sponges (Maquira® - Maringá - PR) were positioned in the graft removal area, along with "X" sutures to control bleeding. The donor area was also protected with Flow resin (Opallis Flow, FGM® - Joinville – SC) for greater patient comfort.

The subepithelial connective tissue graft was inserted into the recipient site through the tunnel with the aid of a resorbable suture (Vicryl, Ethicon, Inc., Raritan, New Jersey, USA) and stabilized with simple stitches in the attached gingiva (left and

right sides), near the distal papilla of the lateral incisors. Additional suspensory sutures were used to stabilize and coronally position the graft. Simple sutures were also used to close the relaxing incisions, along with simple and suspensory sutures in the double papilla flap for coaptation and coronal traction of the flap (Figure 5).

In the postoperative period, the patient was instructed not to brush the area of the involved teeth for 14 days and to avoid mechanical trauma in the region. The patient received the following postoperative medication prescriptions: nimesulide 100 mg every 12 hours for 5 days, amoxicillin 500 mg every 8 hours for 7 days, dexamethasone 4 mg for 4 days, dipyrone 1 g every 6 hours for 3 days if needed for pain, and mouth rinses with 0.12% chlorhexidine digluconate twice a day (every 12 hours) for two weeks. After the surgical procedure, the patient received the following postoperative recommendations: a) Do not consume alcoholic beverages; b) Avoid touching the surgical wound; c) Do not brush the region for 14 days; d) For the first 24 hours, consume only cold or chilled foods (ice cream, yogurt, juices, and gelatin).

Figure 4: De-epithelialization of the graft. Positioning of the graft on the Arkansas stone for de-epithelialization.

Figure 5: Photograph of the sutures immediately post-operation.

Seven days after the surgery, the patient returned for suture removal and the removal of the Flow resin protection from the palate, where good healing was observed. Fourteen days postoperatively, the graft area sutures were removed, and satisfactory healing was noted (Figure 6). In images 14 B and 14 C, the clinical aspect of the 2-month follow-up can be observed, highlighting the increase of approximately 3 mm of keratinized tissue. Supragingival calculus was also observed, indicating poor oral hygiene, along with the emergence of frenulum and bridle issues, which will require future interventions such as scaling and root planing (SRP) and frenectomy.

Figure 6: Photograph of the sutures immediately post-operation.

3. Discussion

Gingival recession (GR) is characterized by the apical migration of the gingival margin relative to the cementoenamel junction, leading to the exposure of the root surface [12]. This type of lesion can be observed in specific locations or generalized throughout the oral cavity, potentially causing aesthetic discomfort and dentin hypersensitivity [13, 14]. The most prevalent symptoms of periodontal recession are hypersensitivity and aesthetic dissatisfaction, causing discomfort while speaking and smiling. Sensitivity occurs due to root exposure, allowing this dental structure to be in direct contact with oral environment stimuli [15]. In the clinical case described, the patient reported sensitivity and dissatisfaction with the aesthetics of her smile.

In this clinical case, gingival recessions were observed on the buccal surfaces of the lower incisors, resulting in root exposure and larger clinical crowns, consistent with the clinical findings of Souza et al. [16], who conducted a study with dental students from Unigranrio – RJ. Out of a total of 2,204 teeth examined, 136 teeth presented GR, with the lower incisors being the most affected, presenting 48 teeth with GR (35.30%). The etiology of gingival recession is multifactorial, with predisposing factors such as: bone dehiscence and fenestration; thin bone cortical; reduced height of keratinized mucosa and thickness of the free gingival margin; shallow vestibule; and abnormal frenulum and bridle. Causal factors can include mechanical trauma; occlusal trauma; inflammation; reduced biological width; removable prosthesis structures that can cause compression of anatomical structures; poorly adapted fixed prostheses; inefficient orthodontic treatment; non-carious cervical lesions (NCCLs); deleterious habits, among others [17-20].

The most common factor for periodontal recession is gingival inflammation associated with high levels of plaque and calculus accumulation [21], as seen in the presented clinical case where the patient, despite not reporting parafunctional habits, complained of being unable to properly clean her teeth. However, there are secondary predisposing factors that can cause periodontal migration, such as incorrect tooth positioning, iatrogenic factors, and atypical muscle attachment [22].

In this clinical case, the patient was diagnosed as Cairo RT2, which means there is interproximal attachment loss equal to or less than the buccal attachment loss [1],

and Miller class III, with gingival recession extending to the mucogingival junction, moderate bone and interdental tissue loss, and partial predictability of root coverage. To achieve better results and minimize surgical trauma, several treatments for periodontal recessions have been proposed over time. Thus, more predictable results for root coverage have been obtained using techniques such as subepithelial connective tissue graft (SCTG), guided tissue regeneration, and acellular dermal matrix [23-26].

Subepithelial connective tissue grafts are considered the gold standard for deeper recessions and are frequently used to increase the thickness of soft tissue in natural teeth due to their efficiency in gaining aesthetic gingival volume and papilla reconstruction, achieving better long-term results [21, 27, 28]. In this case report, the technique of SCTG combined with a laterally positioned flap and double papilla was chosen due to the presence of a narrow band of keratinized gingiva, loss of interdental papillae, and a thin gingival phenotype.

Studies indicate that SCTG combined with a laterally positioned flap can be indicated for Miller classes I, II, and III recessions, allowing for a root coverage rate between 70% to 98% [29]. In this circumstance, the use of this surgical technique was suitable for the clinical case in question, as it proved efficient in root coverage, clinical attachment gain, and keratinized tissue thickness. Most periodontal plastic surgeries require a donor area to achieve surgical success [30]. The most common regions for SCTG removal are areas with sufficient thickness of keratinized gingiva that allow for the removal of underlying connective tissue. The preferred donor regions are the palate, edentulous areas, and the retromolar area [31, 32]. The palate is the main donor site due to its significant tissue thickness [31, 33], confirming the choice of the donor area in this clinical case. Therefore, the decision-making process for GR treatment is complex and requires careful evaluation of clinical and anatomical parameters. Moreover, to ensure the success of the surgical technique, a prior treatment is necessary to avoid complications during and after surgery, requiring a thorough evaluation of the donor and recipient areas, considering factors such as systemic control, etiology and clinical characteristics of the recessions, surgical technique and wound asepsis, root surface treatment, recipient site preparation, vascularization, nutrition and tissue thickness, width of gingival tissue, and healing stability [34].

One of the factors to consider is the recipient area, which should have good bone support and vascularization to nourish the graft, thus avoiding tissue necrosis [35, 36]. Additionally, the patient's cooperation and proper maintenance of oral hygiene in the postoperative period are crucial [36]. Various authors concluded that, among several systematic reviews, the use of SCTG achieved greater root coverage results, making it the first choice for deeper recessions, providing long-term stability [37, 38]. Therefore, when properly indicated and executed, the treatment has a high therapeutic success rate, potentially achieving coverage up to the bone crest, as observed in the described clinical case, where the gingival recessions on teeth 31 and 41 were classified as Miller class III and Cairo RT2. Favorable results were obtained, such as increased keratinized tissue, reduced dental hypersensitivity, and patient satisfaction, consistent with Bouchard et al. [39], despite the final result of partial recession coverage, which was expected due to the existing interproximal bone loss, as exemplified by Rebello et al. [40].

4. Conclusion

Obtaining an accurate diagnosis is crucial for developing an effective treatment plan and providing the patient with individualized care that yields satisfactory long-term results and meets their aesthetic and functional expectations. In the case under discussion, based on the diagnosis of Gummy Smile (GS) due to Altered Passive Eruption (APE), Clinical Crown Lengthening (CCL) in the aesthetic area was proposed.

This approach enabled the restoration of smile harmony, reduction of gingival exposure when smiling, and an increase in tooth size, which significantly improved the patient's self-esteem and quality of life.

The application of Low-Power Laser (LPL) therapy in the postoperative period promoted satisfactory outcomes in terms of tissue healing. Therefore, it can be concluded that LPL was an effective adjunct therapy in the postoperative care phase of the surgery to correct GS. This case illustrates the importance of a tailored approach that not only addresses the physical corrections required but also enhances the patient's psychological well-being by improving their smile aesthetics.

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Supplementary Materials: None.

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