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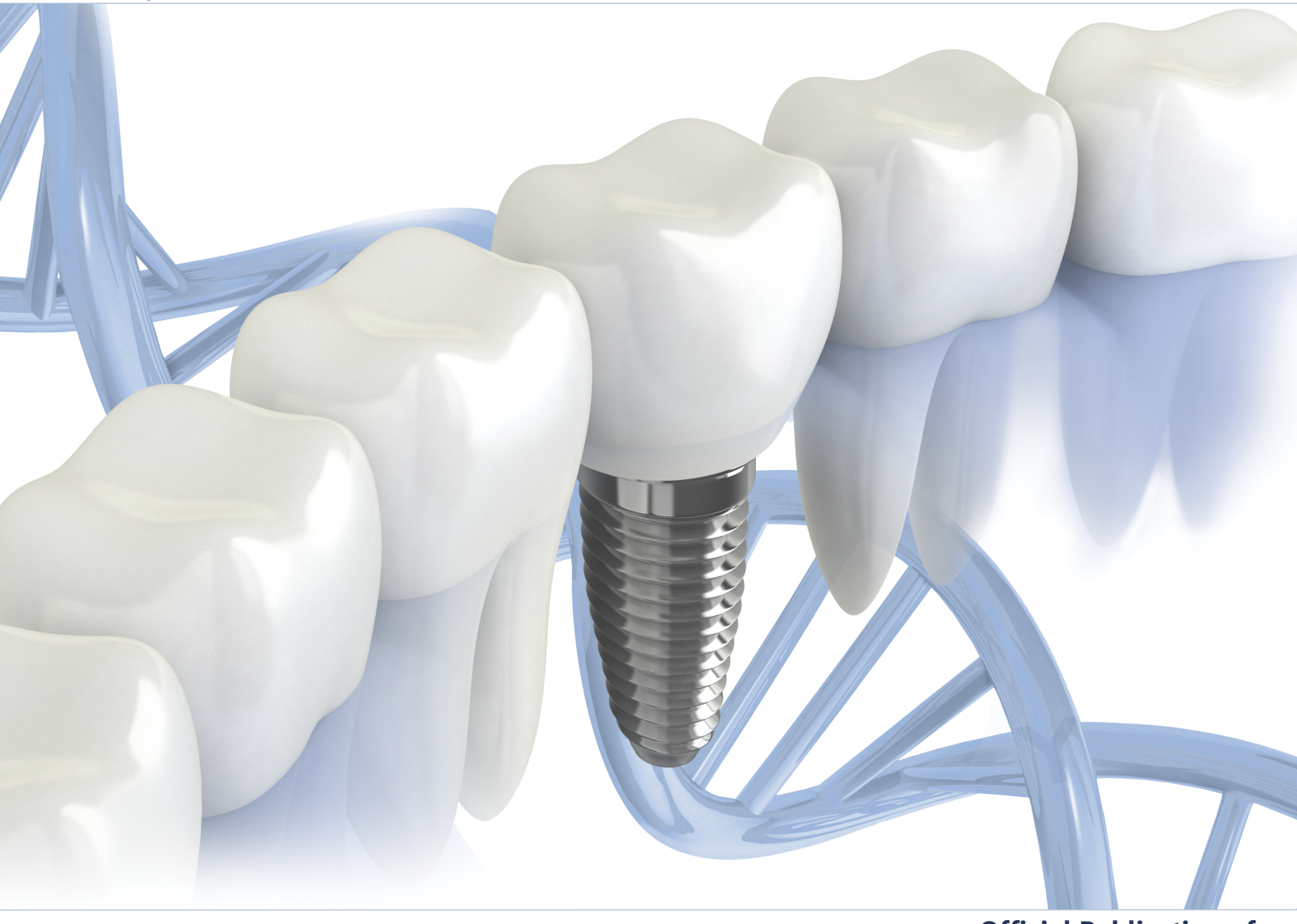

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Case Report

The Effect of the Interproximal Creeping Attachment in Aesthetic Site After Root Coverage Surgery with VISTA Technique - A Case Report

Abstract

Gingival recession is a common manifestation in most populations. The mechanism by which gingival recession occurs is not well understood, but it seems to be complex and multifactorial. The main etiological factors are the accumulation of dental plaque biofilm with the resulting inflammatory periodontal diseases and mechanical trauma due to faulty oral hygiene techniques, especially in thin biotypes. This case report describes the treatment of a vestibular recession associated with interdental bone loss, with the VISTA technique associated with a connective tissue graft. The case was evaluated at 3, 9 months and 48 months after the surgery clinically complete root coverage and increased thickness of keratinized tissue were achieved, and the interdental papilla was augmented improving the soft tissue quality for future orthodontic treatment. VISTA technique associated with a connective tissue graft to reconstruct vertically papilla is a promising alternative for minimally invasive treatment and stable after 4 years.

Keywords: *Creep attachment, gingival recession, papilla reconstruction, periodontal diseases*

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Introduction

Gingival recession (GR) is a problem that affects the majority of young adults.[1] This condition can have several aetiologies that may be grouped into anatomical factors, pathological conditions and iatrogenic factors that may be grouped in: anatomical factors (e.g. lack of attached gingiva, muscular insertions near gingival margins, tooth misalignment, the inadequate thickness of the alveolar bone plate and root prominences); pathological conditions (e.g. periodontitis or viral infections); and iatrogenic factors (e.g. improper restorations invading the biological space, mechanical trauma, including trauma associated with tooth brushing or lip piercing).[2]

The root coverage (RC) of buccal GR with free epithelium and connective tissue graft (CTG) has provided consistent clinical results.[3,4] Thus, several techniques have been presented to reconstruct GR which may involve, in particular cases, the interdental papilla. However, no long-term results have recommended any particular technique over the other, mainly involving the interproximal region.

Within this scenario, the tunnel technique has been considered a more aesthetic and conservative approach to treating root coverage (RC), using CTG and maintaining the papillary integrity, due to avoid vertical releasing incisions.[5]

Over time, after periodontal surgery, a known phenomenon named creeping attachment occurs, which increases the attached gingiva width around the tooth and stops the progressive GR. Thereby, the purpose of the current case report was to digitally evaluate the creep attachment effect, either in buccal as interproximal sites, assessed on long-term (48 months), and to introduce for clinicians the result obtained with a minimally invasive treatment using the tunnel technique.

Case History

A 17-year-old healthy woman was referred to the Periodontology Department at the *Universidade Católica Portuguesa* (Viseu, Portugal) for evaluation of the GR involving the buccal and interproximal surfaces of the mandibular right central incisor [Figure 1a], which already had the interdental bone loss of 2 mm, the periapical radiograph showed some enlargement of the periodontal ligament space between both central

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incisors [Figure 2]. It was classified as RT2, with no pocket depth, local keratinized tissue reduced to 1 mm in the buccal site and no tooth mobility recorded. Moreover, the occlusal trauma was not evaluated because the patient had an anterior open bite.

Beyond treating the GR, the proposal was also to increase the keratinized tissue (KT) height, thickness and clinical attachment level (CAL), in order to improve the aesthetic, plaque removal and local mechanical resistance. Treatment planning consisted of initial periodontal therapy, periodontal plastic surgery, maintenance phase and re-evaluation. The patient received cause-related therapy with ultrasonic instruments and air-polishing devices and was instructed to use the modified Bass technique with a soft brush in order to minimize the local trauma.

Following local anaesthesia and root planning with Gracey curettes (LM®, Finland), the exposed root surface was conditioned for 2 min with tetracycline and cleaned with saline solution. Two buccal-access incisions in the mucosa were performed and intrasulcular incisions around the involved tooth were done using microsurgical blades specially designed for tunnel technique (Deppeler®, Switzerland) [Figure 3]. Through these incisions, a mucoperiosteal tunnel was created, exposing the facial bone plate and root dehiscence, extending at least one or two teeth beyond the tooth requiring RC, to mobilize gingival margins and facilitate coronal repositioning. The subperiosteal tunnel was extended interproximal under each papilla, as far as the embrasure space would allow, without making any surface incisions through the papilla, to achieve complete mobilization of the flap. Then, the papillae were gently undermined using a specially designed tunnelling knife (TKP, Deppeler®, Switzerland). A 1.0- to 1.5-mm-thick palatal CTG was harvested and de-epithelized, whereas the donor area was stabilized with Periacryl® (Glustitch).

A small and prepared CTG was placed between the two mandibular central incisors to correct the GR and the vertical papilla defect present [Figure 3]. The second graft was inserted from the tunnel by means of simple sutures and secured, on the inner side of the tunnel flap at the CEJ or 1 mm below using a suspended suture.

Special attention was paid not to disrupt the interdental papillary tissues. The mucogingival complex was then advanced coronally and stabilized in the new position [Figure 1b].

The patient received analgesics, was not allowed to brush the surgical site for 21 days post-operatively and was also advised to use a 0.12% chlorhexidine gluconate mouth rinse solution twice a day for 1 min during the first 3 weeks post-surgery.[6] At this time point, the patient was

Figure 1: (a) Initial image of buccal recession tooth 41; (b) Suture end of the surgery; (c) 14 days post-operative; (d) Clinical outcome after 3 months; (e) Clinical outcome after 6 months; (f) Follow-up 48 months

Figure 2: Periapical radiograph of the mandibular central incisors

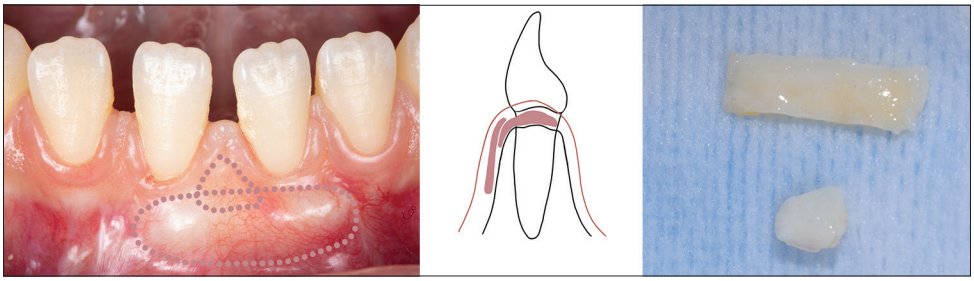

Figure 3: Surgery schematics

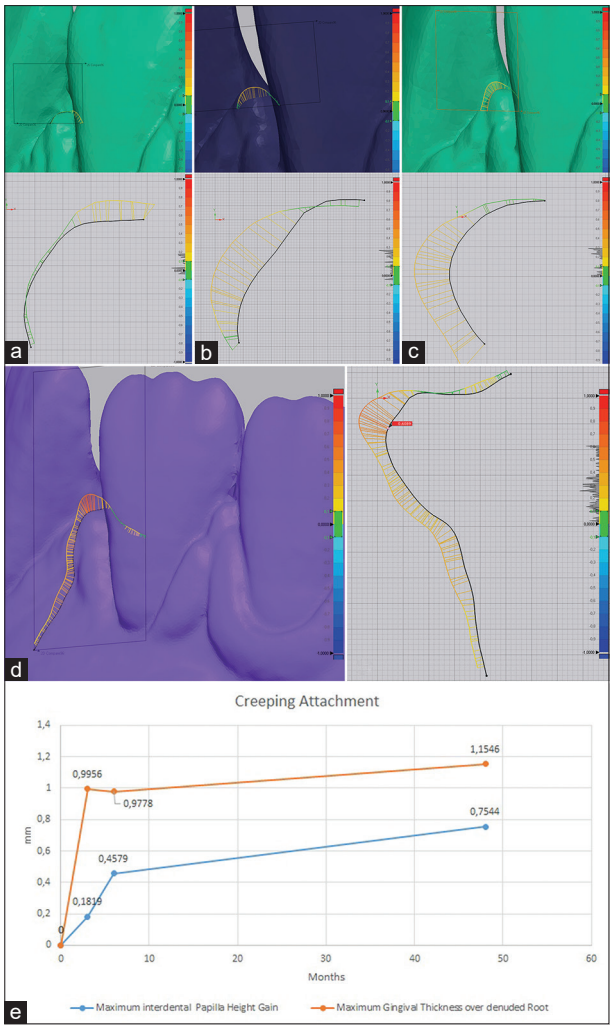

Figure 4: (a) Interproximal creep attachment at 3 months, (b) 3 months to 6 months (c) 6 months to 48 months, (d) Interproximal creep attachment from 3 months to 48 months (e) Interdental papilla height gain

instructed in mechanical tooth cleaning of the surgical sites using an ultra-soft manual toothbrush using the roll technique, gradually returning to regular oral hygiene habits at 1 month post-surgery recall appointments including professional supragingival tooth cleaning and individually tailored oral hygiene instructions were scheduled.

The healing period was uneventful. The suture was removed 14 days later. Full coverage was obtained with minimal swelling [Figure 1c]. Clinical results at 3, 6 and 48 months were recorded, respectively [Figure 1d–f]. All the evaluated parameters are shown in Table 1 and Figure 4, with absolute and relative volumetric alterations over the denuded root using a superimposition technique (Geomagic®, Control X).

An initial model was overlapped by sequential digital models obtained, and after 6 and 48 months, the creep attachment area was shown where the graft healed and increased in thickness [Figure 5]. The KT height on the vestibular aspect was increased and the soft tissue graft blended with the adjacent tissues [Figure 1d–f].

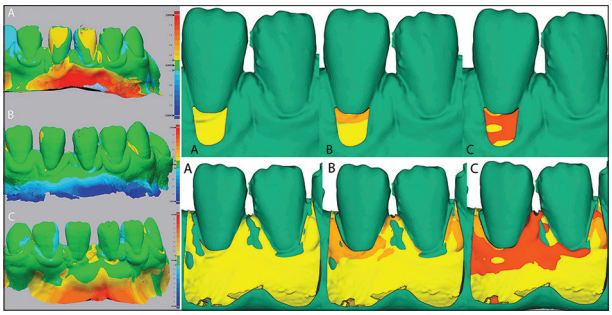

Figure 5: (A) Volumetric changes at 3 months, (B) 6 months, (C) 48 months

Cross-sectional images of the superimposition showed an increase in width and height of the buccal mucosa aspect with a vertical augmentation of the interdental papilla [Figure 4]. We showed that creeping attachment happens and is stable even after 48 months, and the papilla height gain remains stable.

Discussion

Modern dentistry aims to reduce patient morbidity and provide a minimally invasive procedure to allow less extensive manipulation of tissues than conventional procedures while accomplishing the same objectives. Thereby, the tunnel technique can be used in the treatment of GR, which may be associated with interdental bone loss.

Randomized controlled trials (RCTs) are lacking in the treatment involving interdental papilla loss, and a few case reports seem to confirm the use of CTG as the most effective biomaterial.[7-9] Most of the proposed techniques use horizontal incisions interrupting the blood supply to the papilla. Therefore, the VISTA (vestibular incision subperiosteal tunnel access) approach[5] advocates the use of recombinant growth factor technology as an alternative to donor site harvesting, particularly for the simultaneous treatment of multiple contiguous GRs. Conversely, subepithelial CTG-based procedures still provide the best outcomes for clinical practice because of their superior percentages of mean and complete RC, as well as the significant increase of KT.[10]

Thus, it was possible to verify the improvement of the periodontal parameters in the present case report, which showed that the creeping attachment happened and kept the buccal and interproximal tissues stable even after 48 months, presenting a successful papilla height gain. These results encourage future RCTs.

The current case describes the technique for the treatment of RT2 recessions, demonstrating stable, long-term outcomes. This technique improves the biotype before orthodontic treatment and manages to augment the papilla vertically.

The connective tissue graft seems to work as a barrier wall to improve root coverage and all periodontal parameters in the treatment of RT2 recessions.

Table 1: All evaluated parameters, recession characteristics, absolute and relative volume alterations and clinical results during the 48 months

Age (years)	Gender	Tooth	Recession	CEJ	Step (±)	Surgical approach
17	Female	41	RT2	detectable	–	VISTA

	Volume alterations at 3 months		Volume alterations at 6 months		Volume alterations 48 months	
Tooth	**Absolute**	**Relative**	**Absolute**	**Relative**	**Absolute**	**Relative**
41	4.71 mm^3	100%	4.574 mm^3	−2.89%	5.323 mm^3	13.1%
Buccal volume	91.715 mm^3	100%	57.745 mm^3	−37.04%	70.744 mm^3	−22.87%

	0-3 months	3-6 months	6-48 months
Recession depth reduction	1.83 mm	1.83 mm	1.83 mm
% Root coverage	100%	100%	100%
Area reduction	5.01 mm^2	5.01 mm^2	5.01 mm^2
Maximum gingival thickness	1.8438 mm	+0.2725 mm	+0.3339 mm
Maximum interdental papilla height gain	0.1819 mm	+0.2759 mm	+0.2966 mm

	3 months	6 months	48 months
Maximum gingival thickness over denuded root	0.9956 mm	0.9778 mm	1.1546 mm

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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