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Case Report

Dental Implant Replacement Followed by Xenogen Bone Graft, Conjunctive Graft and Roll Technique: A Case Report

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Abstract

Implant therapy in the anterior maxilla is a challenge for clinicians due tissue deficiencies often caused by various conditions, as well as the higher esthetic demanded by patients. Adequate marginal gingival contour and sufficient keratinized tissue width around the implant-supported prosthesis are essential for the maintenance of peri-implant health and optimal esthetics. Thus, this study reports a two-steps technique to improve implant position and increase the thickness of keratinized mucosa after aesthetics complaints. A 53-year-old female patient, after using an external hexagon-type dental implant in the central incisor region (tooth 21) for more than 10 years, presented a complaint of depression in the region of the implant. For optimal esthetic outcome, the implant was removed and an internal-hexagon implant was placed in a more adequate position, and xenogen graft surgery with connective tissue was performed. In a second step, it was applied the Pouch roll technique in order to increase the thickness of the keratinized mucosa in the same region. Thus, soft-tissue augmentation should be considered in implant-supported rehabilitation, being a reproducible, predictable, and less invasive procedure for small defects.

Keywords: Periodontics; Prostheses and Implants

Abbreviations

HE Implant: External Hexagon Implant; HI Implant: Internal Hexagonal Implant

Introduction

Osseointegrated implant therapy is a viable option for the rehabilitation of total and partial edentulous patients, improving masticatory, phonetic and esthetic functions [1]. The challenges related to Implantology are not only limited to the osseointegration process and adequate three-dimensional positioning of the implant in the bone. The aesthetic demands required by patients has lead to the development of techniques that closes aesthetic peri-implant tissue to natural periodontal tissue [2].

The predictability and success of this therapy depends on several factors, such as quality and quantity of bone tissue, implants position and distribution in the dental arch, adequate initial stabilization, good general health and oral hygiene, absence of parafunctional habits, as well as the presence of tissue surrounding the implant [1]. It is worth mentioning that in addition to the gingival architecture, the height and volume of bone tissue influence the

peri-implant aesthetics. When alterations in these structures occur, it is necessary to use reconstructive procedures, such as autogenous, allogen, xenogen or alloplastic bone grafts [3]. In this context, current studies are directed to explore if mucosal thickness would have similar implications around dental implants.

However, the influence of keratinized mucosa thickness on peri-implant tissues health is still a controversial subject [4]. Although several authors have reported no relationship between the presence of keratinized tissue and dental implants success [5-7], recent studies pointed out that the thickness of this tissue would have direct influence on implants success [8-11]. The absence of adequate keratinized gingiva was also associated with increased plaque accumulation, probing bleeding, inflammation and gingival recession [12,13]. These findings suggested that the thickness of the keratinized mucosa could determine future dynamics of soft tissues around dental implants [14].

The manipulation and rehabilitation of peri-implant aesthetic areas involve a range of surgical techniques aiming to fill defects around implants, which are called periodontal plastic surgeries (Miller 1988). The main issue is to identify the characteristics, advantages and indications of each technique and their potential in aesthetics gains, since the union between the soft tissues and implant surface is more fragile when compared to the tooth. This is due to the fact that the orientation of the periodontal fibers is parallel and not perpendicular to the implant surface. In addition, there is also a smaller number of cells and blood vessels, consequently decreasing the protection of this tissue [15,16].

Based on the above, this article reports a clinical case in which treatment was performed in two steps. Primarily, a dental implant was removed and replaced for another in a more adequate position, and xenogeny bone graft surgery with connective graft was performed; in a second step, the Pouch roll technique was used in order to increase the thickness of the keratinized mucosa around the implant previously installed.

Case Presentation

A 53-year-old female patient, after having undergone the installation of external hexagon-type dental implants in the central incisor region (tooth 21) for more than 10 years, presented a complained about a depression in the region of the implant, causing an aesthetic defect. During anamnesis, no relevant aspects were observed in the patient's previous and current medical history that could interfere in the diagnosis, treatment and prognosis of the intervention to be treatment (Figure 1).

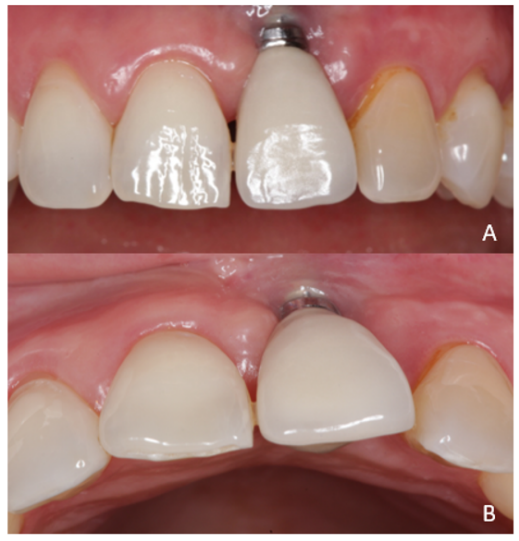

Figure 1: Initial clinical aspect. A: represents the vestibular view; B: represents the occlusal view.

After evaluating computed tomography scans, it was confirmed that the implant was installed adjacent to the vestibular crest (Figure 2). We chose to remove this implant the implant was removed and replaced with an internal-hexagon implant, followed by xenogeny bone graft associated with a connective graft. Before surgical procedures, the patient received biofilm control and guidance for maintenance of periodontal health.

In the surgical process, the patient received infiltrative local anesthesia in the vestibular and palatal region next to the defect, using lidocaine 2% with vasoconstrictor. After removing the (its) ceramic crown, the implant was removed with retriever (Figure 3). Immediately after removal of the HE implant, the (a) HI implant (3.5 mm x 11 mm, Implacil) was installed in the correct position (Figure 4). Once the recipient bed was prepared, the palate was anesthetized to remove the connective tissue. The incision was made parallel to the occlusal line with a 15C blade positioned at 90° in relation to the hard palate. A vertical incision was made in the distal and mesial regions of the fabric to be collected, and then remove it (Figure 5).

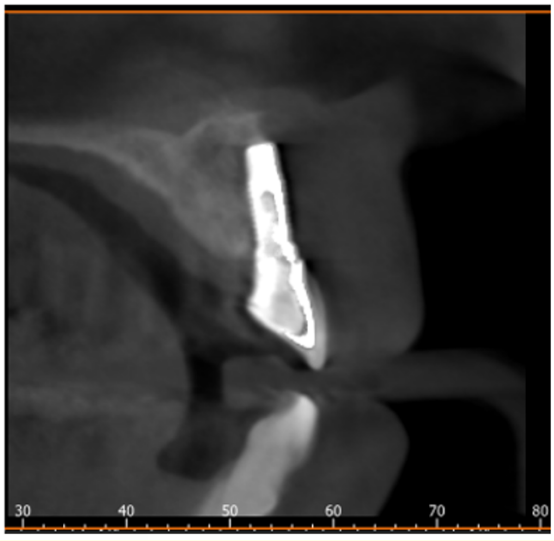

Figure 2: Computed tomography scans showed the (shows) buccal position of the implant.

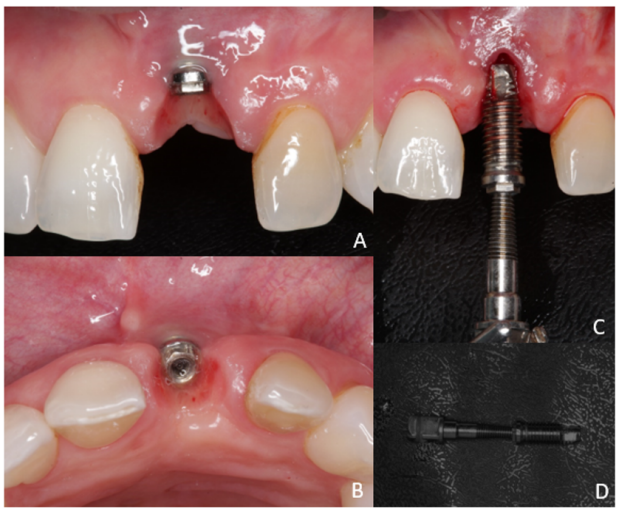

Figure 3: Removal of the initial external-hexagon implant. A, removal of the crown; B, occlusal view after removing the crown (crown removed); C, removal of implant with retriever; D, external-hexagon implant removed from the oral cavity.

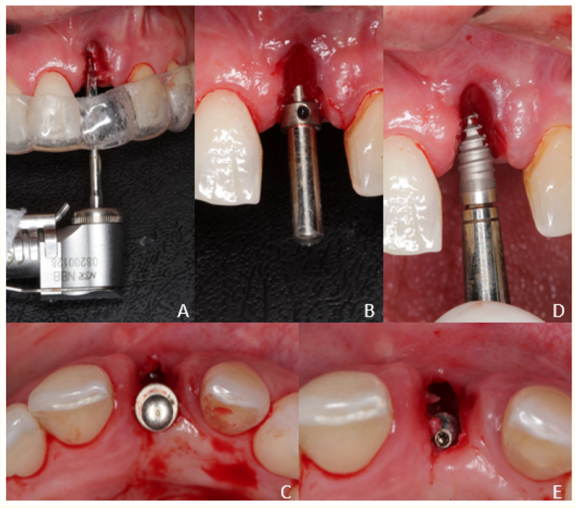

Figure 4: Installation of the new implant. A, use of a surgical guide for the correct position of the internal-hexagon implant; B, vestibular view of the implant position; C, occlusal view of the implant position; D, installation of the new implant; E, occlusal view after installation of the new implant.

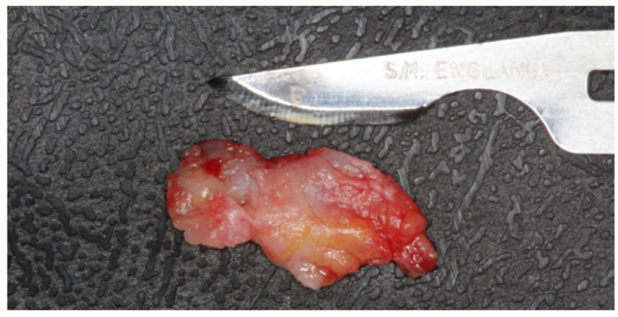

Figure 5: Connective tissue removed from the palate.

After tissue removal, local compression was applied with gauze, for five minutes, in order to reduce local bleeding, and then the suture was performed with 4-0 silk thread. The vestibular bone defect was filled with bovine hydroxyapatite (Lumina Bond) and covered with the graft removed from the palate. It is important to

emphasize that the immobility of the graft was fundamental for its revascularization. Subsequently, the flap was repositioned and sutured with 5-0 nylon threads (Figure 6).

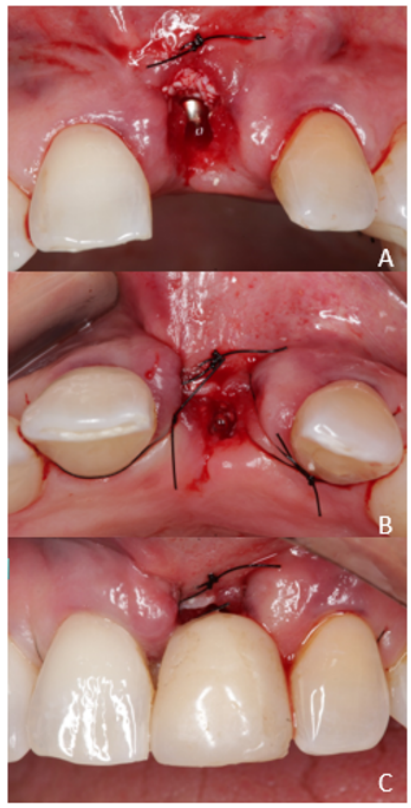

Figure 6: Tissue gain after surgery. A, placement of the xenogeny (bone) graft and connective tissue in the vestibular region; B, suture of the surgical area; C, placement of a provisional prosthesis after the surgical procedure.

After 4 months, once osseointegration was complete, the healing abutment was placed. For greater tissue gain, the roll technique was done by performing a bone marrow incision with a 15C scalpel blade on the bone crest. It was displaced to the palate and the dissection plane was crown-apical. Two other slightly divergent incisions were made in the palatal region to divide the epithelial flap.

After splitting the flap, an incision was made at the base of the connective tissue connected to the periosteum to release the graft, which was moved to the recipient area vestibular mucosa. The graft was folded under the vestibular flap and stabilized with isolated suture at the base of the flap. The vestibular flap was repositioned around the abutment with the graft stabilized by the suture, also performed on the sides and at the base of the wound with interrupted stitches of no resorbable Nylon 5.0 (Figure 7). The postoperative care consisted of orientation regarding oral hygiene, feeding and rest, and the prescription of analgesic Sodium Dipyrone (500 mg) and anti-inflammatory (nimesulide 100 mg) drugs. Chemical plaque control was also prescribed, being recommended mouthwashes with 0.12% chlorhexidine digluconate every 12-hour, during 1-minute each for 7 days.

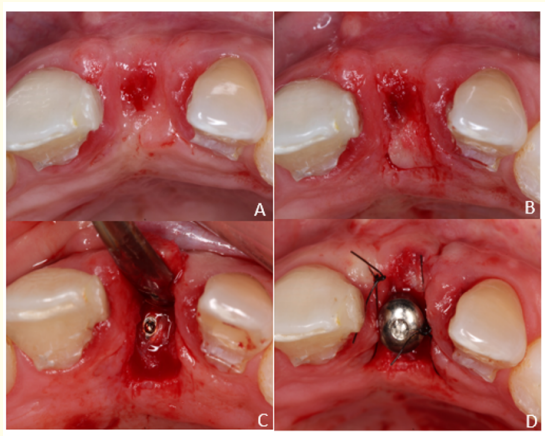

Figure 7: Installation of the healing abutment. A, occlusal aspect after removal of the provisional prosthesis; B, Injection (?) made for the Roll Technique; C, access to implant cover; D, healing abutment placement and suturing of the region (placed and suture).

The patient returned to the postoperative examination after seven days, and the suture was removed after 14 days. The patient was kept under control for 30 days and with two months of preservation, tissue gain in thickness was observed gained thickness. The patient was referred for prosthetic rehabilitation and, for gingival conditioning, a provisional crown was installed after three months of the mucogingival surgery. It was observed that, after the 6-month period of preservation, tissue thickness gain favored the vestibular emergence profile of the prosthesis and gingival papillae conformation (Figure 8).

Figure 8: Final clinical aspect of the patient. A: represents the vestibular view; B: represents the occlusal view.

Discussion and Conclusion

For optimal esthetic outcome, soft-tissue augmentation should be considered in implant-supported rehabilitation. Implant therapy in the anterior maxilla is a challenge for clinicians [17]. They are often confronted with tissue deficiencies caused by various conditions and high esthetic demands by patients [18]. Thus, achieving and maintaining an adequate marginal gingival contour and sufficient width of keratinized tissue around the implant-supported prosthesis are important for the maintenance of peri-implant health and optimal esthetics [19,20]. This study demonstrated soft-tissue stability with pouch roll technique to restore the marginal gingival contour.

The original pouch roll technique was first described by Abrams in 1980 [21] and was used reconstruct the gingival margin contour around the residual edentulous ridge for a fixed prosthesis. Later, Scharf and Tarnow [22] and Hürzeler [23] suggested the use of this technique to reconstruct the gingival margin contour of a mild or moderate buccal deficiency during the second stage of implant surgery. However, it is recommended that this technique be performed concomitant to implant surgery, which provides the second-stage surgery an additional opportunity for peri-implant tissue management.

Advantages of the modified pouch roll technique are the preservation of papilla integrity, increased soft-tissue thickness, improvement in esthetics by eliminating the buccal soft-tissue concavity, and healing by primary intention [19,24-27]. In cases of minimal bone volume, the use of narrow implants and/or the modified pouch roll technique could figure as an alternative to bone grafts, minimizing postoperative morbidity, risks of infection, costs and treatment time. However, restoring more than 2-3 mm of soft tissue demands bone-grafting procedures [17].

Therefore, the case report has demonstrated that this procedure is considered more reproducible, predictable, and less invasive for small defects.

Disclosure

This study there isn't interest conflict. Expecting your decision, we are looking forward to being included in this outstanding publication.

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