

Modified Roll Flap Technique for Horizontal Ridge Augmentation – A Case Report

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Abstract

The modified roll flap technique is a procedure in which a pedicled connective tissue is harvested and rolled from the palate into the oral mucosa in order to increase the peri-implant soft tissue width. This technique is effective, provides an excellent alternative for the soft tissue recovery of deficient areas, improves gingival phenotype and aesthetics. The aim of this paper is to report a clinical case in which the modified roll technique was employed along with the placement of a provisional.

Keywords: Oral Surgical Procedures, Oral surgery, Dental implants

Introduction

Over time, aesthetics became a paramount subject in dentistry, which resulted in the development of techniques that promote buccal harmony to the patient. Dental implants, along with soft tissue grafting techniques, are a promising rehabilitation procedure for missing teeth [1].

One may often encounter hard and soft tissue deficiency in missing teeth area which will preclude the correct tridimensional placement of implants. Besides, the crestal deformity may cause hygiene and aesthetic issues [2]. A tooth loss causes an alveolar bone damage consequently leading to a crestal volume reduction. It also may be caused by trauma, infections, odontogenic tumors, developmental issues, among others [2-3].

As consequence, some surgical procedures were developed aiming to augment soft tissue in order to correct crestal deficiencies and enhance soft tissue width. These techniques are namely: free gingival graft, connective tissue graft, roll flap technique and modified roll flap technique [3].

The modified roll flap technique encompasses a broader rolling connective tissue volume, what consequently minimizes the bone exposure and preserves the epithelium above, coming up with an easier post operatory recovery time for the patients [2]. This technique is indicated for mild or moderate cases [5].

Case Report

A 22-year-old female patient was referred to an implant-based rehabilitation due to the loss of the right upper second premolar due to trauma.

Her medical exam revealed no alterations whereas the intraoral examination revealed the absence of the Upper right second premolar along with a buccal crestal depression. As consequence, it was planned for this case a roll flap technique, along with dental implant placement and provisional crown.

The patient was given 1 hour preoperatively: Amoxicillin 500mg (*EMS - Germed Farmacêutica, São Paulo-Brasil*), 2 capsules P.O., Dexamethasone 4mg (*EMS S/A, São Paulo- Brasil*), 1 tablet P.O. and Dipyrone 500mg (*EMS S/A, São Paulo- Brasil*), 1 tablet P.O. The anesthetic drug of choice was mepivacaine 2% and epinephrine 1:100.000 (*Cristália Produtos Químicos Farmacêuticos Ltda., São Paulo-Brasil*).

With the aid of a 15C blade an incision was conducted on palate, close to the alveolar ridge and after that the epithelium was removed so that only the connective tissue was left. Hence, the connective tissue flap was detached and moved buccally. From that moment on the implant was placed in the ridge.

Vertical mattress sutures were performed with PTFE 5-0 sutures so that the roll flap was placed buccally like an envelope.

A screw retained temporary restauration was built over a 4.5 x 4 mm titanium provisional abutment - *Linha Ideale (Implacil De Bortoli, São Paulo-Brasil)*, along with *Ideale 4,5 x 4 x 1,5 mm* abutment (*Implacil De Bortoli, São Paulo-Brasil*). A *Maestro 4 mm x 11 mm* implant was placed (*Implacil De Bortoli, São Paulo-Brasil*) reaching a torque close to 40N.

The patient was prescribed to take postoperatively Amoxicillin 500mg (*EMS - Germed Farmacêutica, São Paulo- Brasil*) 1 capsule every 8 hours P.O. for 7 dias; Nimesulide 100mg (*Eurofarma Laboratórios S/A, São Paulo-Brazil*) 1 tablet P.O. every 12 hours for 3 days; and Dipirona 500mg (*Sanofi Medley Farmacêutica Ltda., São Paulo-Brazil*) 1 tablet P.O. every 6 horas in case of moderate pain. Besides, the patient was advised to take a soft and cold diet.

The post operative follow up was taken monthly, both clinically and radiographically. The surgery site healed uneventfully, and the surgical procedure provided satisfactory aesthetical results.



Figure 1 – Region of tooth 14, showing deep gingiva.



Figure 2 – Occlusal region of tooth 14.

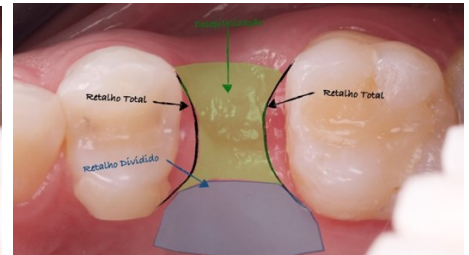


Figure 3 – Surgical incision planning.



Figure 4 – Incision and de-epithelialization of the connective tissue.



Figure 5 – Detachment of de-epithelialized tissue.

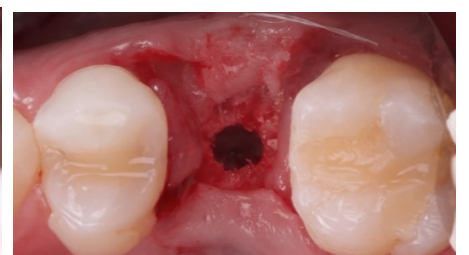


Figure 6 – Implant installation hole.



Figure 7– Preparation of the temporary tooth with a 5 x 4 titanium coping.



Figure 8 – Placement of the Implacil Maestro 4 x 11 Implant.



Figure 9 – Torque ratchet.

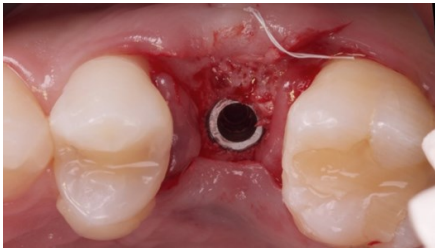


Figure 10– Occlusal view of the Implacil Maestro 4 x 11 Implant.

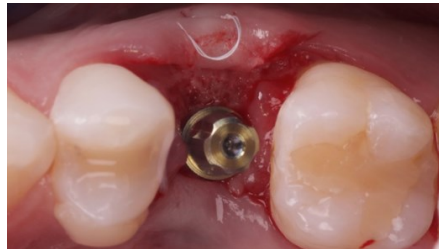


Figure 11 – Occlusal view of the Ideali Abutment 4.5 x 4 x 1.5.



Figure 12 – Occlusal region of the temporary tooth.



Figure 13 – Occlusal region showing the implant and scar tissue.



Figure 14 – Image of temporary tooth.



Figure 15 – Final image of the procedure.



Figure 16– Emergency profile.



Figure 17 – Installation day of the final crown in monolithic zirconia.



Figure 18 – Installation day of the final crown in monolithic zirconia.



Figure 19 – Follow-up 2 years.

Discussion

Dental loss is associated with crestal atrophy and bone volume deficiency, which may jeopardize the correct tridimensional implant placement and lead to an unsatisfactory aesthetic result [4, 6]. Therefore, in these cases reconstructive soft and hard tissue surgical procedures may be indicated [6].

The modified roll flap technique followed by a provisional restoration is indicated for soft tissue deficiency [2, 4] providing a satisfactory aspect in the buccal reconstruction [4, 6].

The modified roll flap technique presented by Scharf, Tarnow, in 1992, is an evolution of the roll technique described by Abrams in 1980, who prescribed such technique for the management of soft tissues after the placement of dental implants. It allows the correction of mild horizontal deficiencies as well as enhancement of the soft tissue width [4, 7].

In cases of mild bone loss, the augmentation may be accomplished by means of connective tissue grafting in order to increase gingival width and maintain aesthetics [5]. The vertical and horizontal bone loss rate is wider within the first year post tooth extraction, reducing the crestal bone volume up to 60% by the end of two year post extraction period, so that reconstructive procedures become mandatory [2, 8], either before or by the time the dental implant is placed [9].

The surgical technique of choice depends on the size and the position of the volume deficiency [4, 6]. These techniques comprise subgingival connective tissue grafting, roll technique, modified roll technique, mixed grafts, among others [4, 6, 10].

Whereas the traditional connective tissue grafting techniques demand two - stage surgeries and a moderate post operative discomfort [3-4, 6, 11], the Modified Roll Flap technique is a single-stage procedure hence exposing the patient to a mild post operative period [5, 12].

The main indication for the use of the Modified Roll Flap technique is the treatment of mild and moderate Miller Class I between the premolar area except at midline due to the presence of papillae [3, 10-11, 13]. This kind of flap allows the soft tissue to reach an ideal contour in order to place dental implants [15].

Moreover, since the Modified Roll Flap provides a vascularized graft, its stabilization is increased at the grafted area [3, 12, 16-17] and increases in almost 100% the buccal soft tissue width [1, 12, 15-18]. There is a width increase close to 2,5 mm and of keratinized mucosa close to 1,8 mm [14].

In addition to its simple feasibility, this technique is also reliable, predictable [8], less invasive [8], minimal trauma [1], and provides adequate aesthetics [5].

Conclusion

The Modified Roll Technique has proven to be a good choice for reconstruction in defective ridges since it improves the mucosal width and the peri-implanter phenotype, with minimal post operative discomfort.

Conflict of Interest

The authors declare no conflict of interest.

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