

Technique of rotational palatal connective closure of post extraction sockets

Abstract / Introduction: Complete marginal soft tissue sealing of the socket after immediate implant placement and / or guided bone regeneration is essential. Among the techniques of socket closure, we highlight the pedicle flaps. **Objectives:** To describe and explain the technique of rotational palatal connective closure of post extraction sockets. **Methodology:** Case report of agenesis of tooth #15 treated by means of atraumatic extraction of tooth #55 and the technique of rotational palatal connective closure. **Results:** The patient had a very satisfactory 7-day postoperative follow-up. **Conclusion:** The technique presents esthetic excellence associated with marginal function and homeostasis, an extra source of nutrition from the pedicle, lower morbidity and absence of an isolated donor site. **Keywords:** Connective tissue. Tooth extraction. Periodontics.

Abraão Moratelli PRADO

Masters student in Dentistry, Federal University of Santa Catarina (UFSC).

Lucas Vieira PIM

Specialist in Implantodontics, UFSC.

José Moisés de SOUZA JR

PhD resident in Implantodontics, UFSC.

João Gustavo Oliveira de SOUZA

PhD resident in Dentistry, UFSC.

Ricardo de Souza MAGINI

PhD in Periodontology, School of Dentistry — University of São Paulo/Bauru.
Professor, Department of Dentistry, UFSC.

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Contact address: Abraão Moratelli Prado
Rua Capitão Américo, 148 – Córrego Grande – CEP: 88037-060
Florianópolis/SC – Brazil — E-Mail: abra_mp@hotmail.com

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INTRODUCTION

Success of rehabilitation with dental implants is directly linked to the degree of harmony obtained between the three bases of implant dentistry: bone tissue, soft tissue and prosthesis. If one of these three edges in the triad of success at implant dentistry is not crafted correctly, success will not be achieved.¹

Soft tissues are directly connected to esthetics – when they restore the parabolic architecture of the gingival margin and correct defects of thickness and / or height of the areas to be rehabilitated – and to function – not only when they are used to increase / rearrange keratinized mucosa of which role is important in implant homeostasis and longevity, but also when they prevent the passage of air between implants, avoid problems of diction and are used to promote closure of a extraction socket previously filled with graft material or submitted to immediate implant loading.^{1,2}

Soft tissue might be used around implants as follows: free grafting techniques with either epithelial / connective tissue or subepithelial connective tissue when its removal is performed at a distant donor area and, as a consequence, nutrition of the recipient area is limited and depends on the intimate contact between the tissue to be grafted and the host bed.^{3,4}

In order to enhance nutrition and, thus, increase predictability of techniques used to increase quality and quantity of soft tissue, pedicle flap techniques have been developed. These techniques have major advantages over free grafting: a) An extra source of nutrition from the pedicle; b) Greater predictability; and c) Lower morbidity due to elimination of a second surgical site.

Techniques using buccal pedicles have some disadvantages such as unfavorable esthetics due to decreased depth of the vestibule and discrepancy of mucogingival junction. However, to avoid these complications and to reduce morbidity of the procedure, a palatal flap is indicated. It only includes connective tissue buccally rotated so as to keep the mucogingival line intact and to increase quantity and quality of the surrounding soft tissue. The aim of this article is to report a clinical case and describe as well as elucidate the technique of rotational palatal connective closure which aims at achieving esthetic excellence associated with function and marginal homeostasis.

LITERATURE REVIEW

After tooth extraction, the search for alveolar sealing with pedicle flaps has been documented and developed since the early 1990s.⁵ One of the techniques consists in performing two total-thickness relaxing incisions at the buccal surface of the socket and displace the tissue towards the ridge in order to close the socket. Subsequently, at the tooth mesial to the socket, a partial-thickness flap is reflected to the donor site in order to cover the exposed bone area. This technique has some disadvantages, especially esthetic: reduction of the vestibule and alteration of the mucogingival line; requirement of a satisfactory amount of keratinized tissue in the area. However, it is recommended for jaw sockets and areas without esthetic requirements which do not have the palate as a donor site.

In the late 1990s,⁶ another technique was described in the literature for post extraction sockets closure. The procedure aims at rotating the palatal connective tissue adjacent to the area to be sealed in the

form of a pedicle flap. A partial-thickness incision is made in the mesial palate of the operated socket. Connective tissue is then detached from the underlying bone and the pedicle flap is buccally rotated within the socket dimensions for marginal sealing of the site. Subsequently, the tissue is sutured. This approach has the main advantage of maintaining the vestibule and the mucogingival line, in addition to increasing soft tissue volume. However, it is limited to upper posterior teeth areas where the palate is present, and is contraindicated to thin and shallow palate.

CASE REPORT

Patient attended the dental clinic reporting discomfort, increase of dental mobility and color changing of tooth #55 (Fig 1). After the first interview as well as clinical and radiographic examinations, agenesis of tooth #15 was diagnosed. Treatment included extraction for subsequent implant-supported

rehabilitation. As the conditions of bone and gingival tissues were not favorable for immediate implant placement, extraction and tissue handling without involvement of the vestibular region were carried out before implant placement. Thus, the technique of rotational palatal connective closure was recommended to prevent changes in mucogingival junction position and promote the formation of a thicker tissue in the alveolar ridge.

After atraumatic extraction of the compromised tooth (Fig 2), the mesial-distal and bucco-palatal lengths of the socket were measured (Figs 3 and 4). These measurements guided the initial incisions, so that the palatal flap had adequate dimensions for the primary closure of the socket (Figs 5, 6 and 7). The palatal flap was divided from posterior to anterior at a distance of two teeth mesial to the socket (Fig 8). Subsequently, internal incisions were performed respecting the dimensions of the socket previously measured.



Figure 1. Gingival recession.

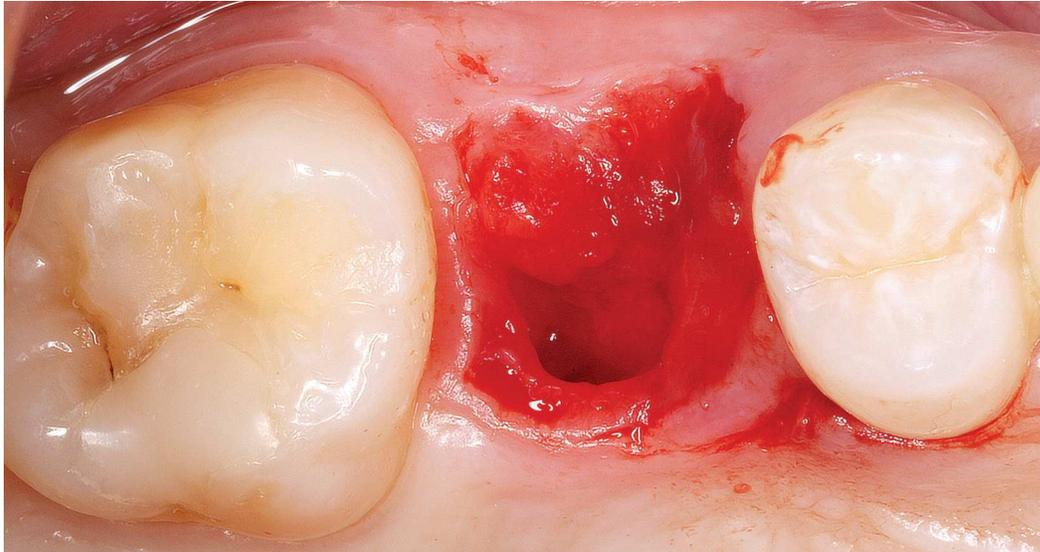


Figure 2. Post-extraction socket.

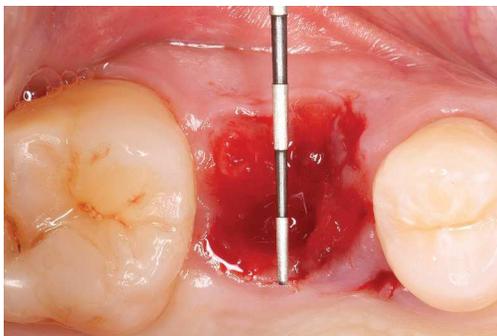


Figure 3. Bucco-palatal dimension of the socket measured with a millimeter probe.

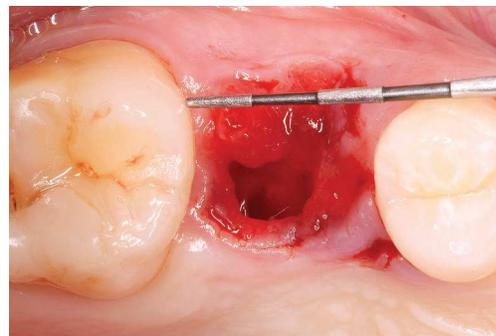


Figure 4. Mesio-distal dimension of the socket measured with a millimeter probe.



Figure 5. Millimeter probe used to measure flap width corresponding to the mesio-distal dimension of the socket.



Figure 6. Millimeter probe used to measure flap width corresponding to the bucco-palatal dimension of the socket.



Figure 7. Millimeter probe compressing and marking the tissue so as to favor inner incisions.

Connective tissue was divided according to the thickness of tissue desired. It is important to remember that thickness of 1.5 mm is ideal. For this reason, the clinician should perform total detachment of the flap, including the periosteum, to increase tissue thickness. In the case reported herein, the flap was moved / rotated so as to cover the socket (Fig 9). Later on, an envelope was prepared on the buccal region of the socket

to accommodate the end of the rotated flap (Fig 10). A suture was made to keep the flap in position without tension (Figs 11 and 12). The seven-day postoperative follow-up is shown in Figures 13 and 14.

DISCUSSION

The technique of rotational palatal connective closure is characterized by a partial thickness flap harvested from the

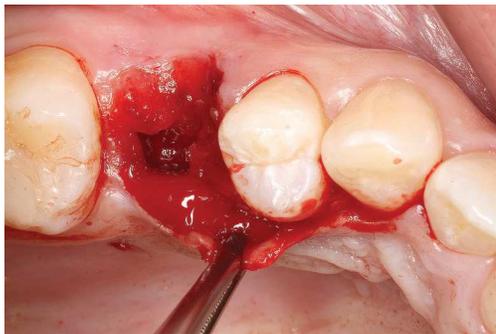


Figure 8. Divided flap: Note the distance up to two anterior teeth.

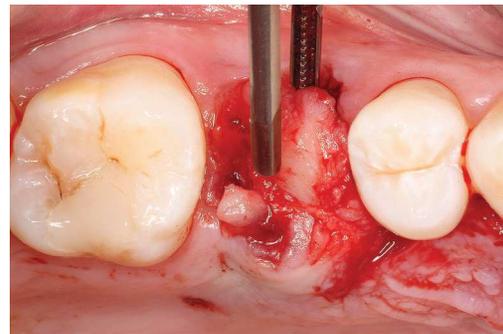


Figure 9. Connective tissue flap positioned over the socket.

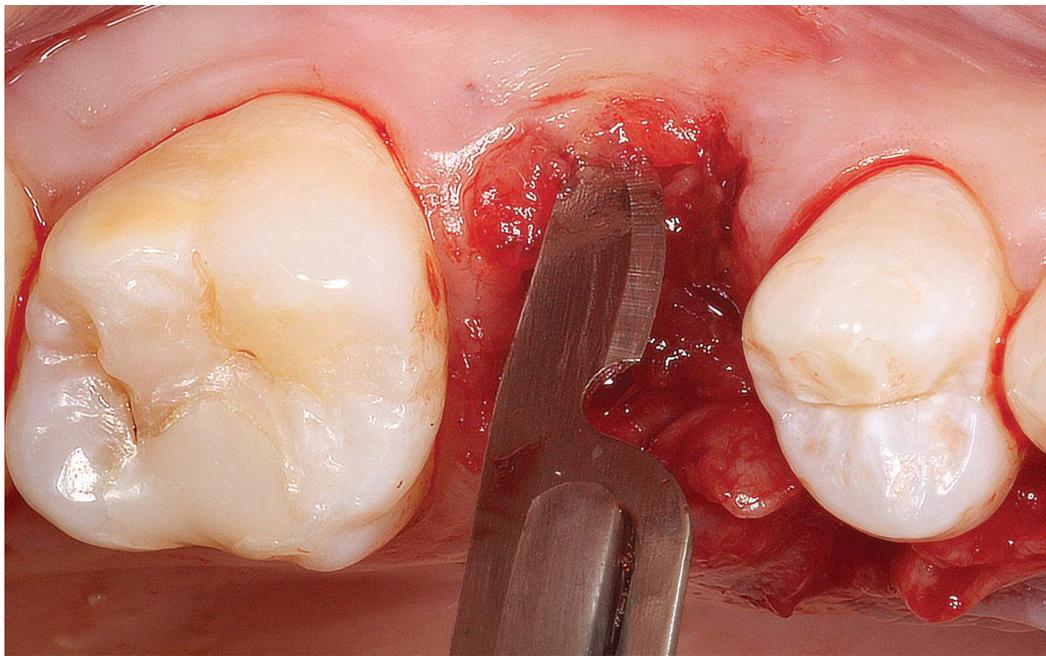


Figure 10. Envelope prepared on the buccal region of the socket to accommodate the end of the rotated flap.

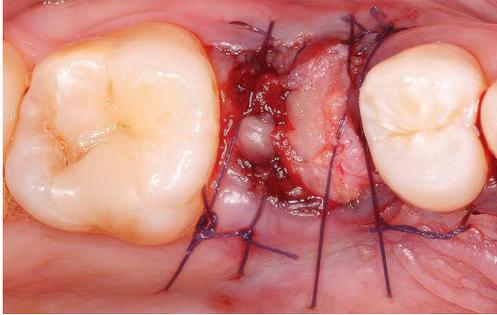


Figure 11. Suture occlusal view.

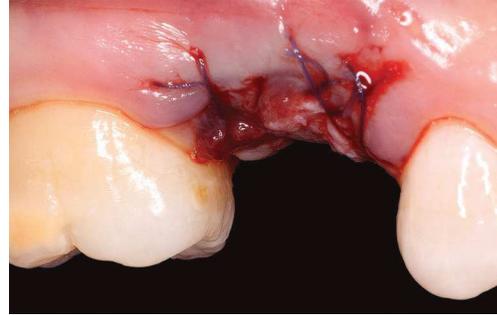


Figure 12. Suture buccal view.



Figure 13. Seven-day postoperative follow-up. Occlusal view.



Figure 14. Seven-day postoperative follow-up. Buccal view.



Figure 15. Implant-supported prosthesis two years in function.

palatal region, so that the connective tissue is separated from the bone in a pedicle shape and is turned toward the buccal region, thereby sealing the site and keeping the integrity of the vestibule and the mucogingival junction.

Importantly, this technique should be avoided in patients with shallow palate due to the proximity of the site with the palatine artery. Additionally, it should also be avoided in the anterior maxilla, given that soft tissue thickness is increased in the area extending from the distal of the canine to the mesial palatal root of the maxillary first molar, and thick alveolar and / or exostosis process is usually present in the first molar region, which limits the size of the graft. Furthermore, thickness of the area can be checked with a needle during anesthesia.⁷

Thus, in the event of small thickness of soft tissue on the palate, a turned flap containing both epithelial and connective tissues might be used.⁸ Its main advantage is that it can be performed in patients with thinner gingival profile of the palate; however, it provides the patient with great discomfort, as it leaves an open wound in the palatal region which postoperatively heals by secondary intention.

A similar procedure was described as the “L” flap technique, in which case mesiodistal and buccolingual gaps are measured so that the flap can be traced in the palate. The longest branch of the “L” must be transverse to the socket, while the smallest branch must be perpendicular to it. The distance between the parallel incisions should have the same dimensions of the socket to be closed. A triangle is traced coronal to the incisions in the area of the angle formed by the “L”. The base of this triangle is located in the smallest branch of

the “L”, while the apex is in the distal portion of the longest branch. Complete socket seal requires that the triangle base be equal to the buccolingual distance of the socket. The triangle is what gives a certain degree of mobility to the flap. This triangle is de-epithelialized and the “L” area becomes a divided flap. Subsequently, the flap is positioned and stabilizing sutures are performed. A raw area remains in the apical portion which will heal by second intention. This technique has wide applicability and can provide complete protection to the socket during the desired period. Nevertheless, it also requires professional skill.⁹ This procedure is indicated to patients with reduced thickness of soft tissue due to increased morbidity.

The literature presents several pedicle grafting techniques focused on Implantology, but no consensus has yet been reached with regard to the technique yielding the best results. According to the intra-oral region and patient’s esthetic needs, we can make use of various surgical alternatives of pedicle grafts. Their main advantages include greater predictability and less morbidity due to improved irrigation (pedicle) and absence of a second surgical site.

CONCLUSION

Among the techniques using palatal flaps for socket closure, the technique of rotational palatal connective closure offers lower morbidity due to providing first intention healing of the palate. It should be indicated in cases of thick palatal soft tissue. Nevertheless, the technique of choice should be directly related to the clinician’s practical knowledge, since the best technique is that which is best performed.

REFERENCES:

1. Palacci P, Nowzari H. Soft tissue enhancement around dental implants. *Periodontol 2000*. 2008;47:113-32.
2. Chung DM, Oh TJ, Shotwell JL, Misch CE, Wang HL. Significance of keratinized mucosa in maintenance of dental implants with different surfaces. *J Periodontol*. 2006;77(8):1410-20.
3. Covani U, Marconcini S, Galassini G, Cornelini R, Santini S, Barone A. Connective tissue graft used as a biological barrier to cover immediate implant. *J Periodontol*. 2007;78:1644-9.
4. Tal H. Autogenous masticatory mucosal grafts in extraction socket seal procedures: a comparison between sockets grafted with demineralized freeze-dried bone and deproteinized bovine bone mineral. *Clin Oral Implants Res*. 1999;10(4):289-96.
5. Becker BE, Becker W, Ricci A, Geurs N. A prospective clinical trial of endosseous screw-shaped implants placed at the time of tooth extraction without augmentation. *J Periodontol*. 1998;69(8):920-6.
6. Nemcovsky CE, Artzi Z, Moses O. Rotated split palatal flap for soft tissue primary coverage over extraction sites with immediate implant placement. Description of the surgical procedure and clinical results. *J Periodontol*. 1999;70(8):926-34.
7. Reiser G, Bruno JF, Mahan PE, Larkin LH. The subepithelial connective tissue graft palatal donor site: anatomic considerations for surgeons. *Int J Periodont Rest Dent*. 1996;16(12):131-7.
8. Nemcovsky CE, Artzi Z. Split palatal flap: a surgical approach for primary soft tissue healing in ridge augmentation procedures: technique and clinical results. *Int J Periodontics Restorative Dent*. 1999;19(2):175-81.
9. Goldstein M, Boyan BD, Schwartz Z. The palatal advanced flap: a pedicle flap for primary coverage of immediately placed implants. *Clin Oral Implants Res*. 2002;13(6):644-50.