

# Use of Buccal Fat Pad in the Treatment of Peri-Implant Mucosal Defect: A Case Report

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The present study describes a clinical case in which the buccal fat pad (BFP) was used to improve the contour of the peri-implant mucosa. To our knowledge, this is the first case report of such an application in the literature. A 58-year-old woman presented with teeth #2 and #3 missing and an indication for extraction of tooth #4. After clinical examination and CBCT analysis, immediate implants were placed in the region of the extracted tooth and that of tooth #2 for prosthetic rehabilitation using a three-unit fixed partial denture. There was an extensive mucosal defect in the region of tooth #3, with vertical and horizontal changes in the contour of the mucosa. As an alternative to the use of a subepithelial connective tissue graft, we opted for displacement of the BFP and its accommodation on the alveolar ridge of tooth #3 to improve the buccal tissue contour. After 5 years of follow-up, satisfactory gain and maintenance of mucosal volume were observed in the treated area, as well as improvement of buccal tissue contour. The use of BFP seems to be a feasible alternative for filling and treating peri-implant mucosal defects.

**Key Words:** dental implant, fat pad, periodontal atrophy, dental esthetics

## INTRODUCTION

There is a growing expectation for good esthetic outcomes in patients of rehabilitation treatments mimicking natural dentition. At the same time, the practitioner faces an increasing number of options that will result in successful functional and esthetic outcomes as long as biological principles are understood and respected.

Vertical and horizontal changes in soft and hard tissues after tooth loss are determinants of esthetic outcomes as they interfere with the correct three-dimensional positioning of the dental implant and consequently with facial soft tissue parameters, such as emergence profile and papilla.<sup>1</sup> Approximately 25% of the bone volume is lost in the first year following tooth extraction, causing a progressive alveolar loss of 40%–60% within 5 years.<sup>2</sup> Significant vertical and horizontal reductions affecting the three-dimensional profile of the alveolar ridge are observed. The extent of morphological changes is dependent on various patient-related factors and wide variation exists among individuals.<sup>3</sup>

In addition to the need of allowing bone tissue regeneration for an adequate three-dimensional positioning of the implant, the recovery of the peri-implant mucosal tissue must

also be considered. An apically positioned flap combined with a free gingival or connective tissue graft is commonly used to increase soft tissue volume within the oral cavity, providing good esthetic results.<sup>4</sup> However, use of autogenous tissue has some disadvantages that are generally related to the need for a second surgical site, thus increasing patient morbidity and surgery time. Allogeneic and xenogeneic materials, such as porcine-derived collagen matrix, have been employed to minimize these disadvantages. That said, the high cost of biomaterials and the lack of longitudinal follow-up studies are important drawbacks.<sup>4–6</sup>

Within this context, the use of the buccal fat pad (BFP) as a soft tissue graft for treatment of peri-implant mucosal defects in posterior regions of the maxilla combines the advantages of autogenous materials (eg, better bio-compatibility and lower cost) and substitutes (eg, less morbidity). Since the autogenous material is located close to the area to be treated, there would be no need for another surgery site or even for access to the palatal region.

Therefore, the objective of the present study is to demonstrate the possibility of clinical application of BFP as an alternative to subepithelial connective tissue for increasing the volume of peri-implant tissue and for long-term volume maintenance.

## CASE REPORT

A 58-year-old female patient with teeth #2 and #3 missing presented with an indication for extraction of tooth #4. During

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medical history review, the patient denied smoking and had good general health. Her surgical risk was classified as ASA 2.

Physical examination revealed severe crown destruction of tooth #4, tenderness to vertical and horizontal percussion, and tooth mobility. In addition, changes in the tissue contour were found that corresponded to the region where tooth #3 had been extracted (Figure 1).

Cone beam computed tomography (CBCT) showed an image suggestive of root crack but with no involvement of the buccal wall. The availability of bone in the region of tooth #4 would enable immediate implant placement during extraction. However, the amount of bone in the region of tooth #3 was insufficient for implant placement, whereas sufficient bone was available in the region of tooth #2. Therefore, the plan was to extract tooth #4 with immediate implant placement and place another implant in the region of tooth #2. In addition, BFP displacement was performed to fill the mucosal defect in the region of tooth #3.

As preoperative medications, 1 g amoxicillin and 8 mg dexamethasone were administered 1 hour before the procedure. After intra- and extraoral antiseptics with 0.12% and 0.2% chlorhexidine digluconate, respectively, the operative fields were prepared and local block anesthesia was applied with 2% mepivacaine hydrochloride plus epinephrine (1:100 000, DFL, Rio de Janeiro, Brazil). The tooth was extracted using a periosteal elevator and micro-elevators to minimize trauma to the surrounding alveolar walls.

Implants of 3.5 × 11.5 mm and of 4.3 × 8.0 mm (Drive CM Acqua, Neodent, Curitiba, PR, Brazil) were installed, respectively, in the regions of teeth #4 and #2. The peri-implant gap in the region of tooth #4 was filled with hydroxyapatite (Osteogen, Intra-Lock, Boca Raton, Fla). Once the implants were placed, a periosteal incision was made on the buccal flap in the region of tooth #2 to gain access to the BFP (Figure 2). After dissection of the mucosal plane, division and pulling of the fat tissue were performed to accommodate it on the bone ridge in the region of tooth #3, without solving the tissue continuity from its origin but seeking to maintain vascularization (Figure 3). Next, the mucosal tissue was sutured over the BFP.

After 60 days, the implants were accessed for abutment placement. A metal-ceramic fixed partial denture was placed after transfer impression and fitting the ceramic framework. During this period, both vertical and horizontal improvement of the mucosal contour was observed in the region of tooth #3 (Figure 4).

Five-year clinical and radiographic follow-up showed good peri-implant health, as indicated by the maintenance of bone level and probing pocket depth with no bleeding. As shown, the use of BFP for padding resulted in the maintenance of mucosal tissue volume in the region of tooth #3, both vertically and horizontally (Figures 5 through 7).

## DISCUSSION

The use of fat tissue as autologous graft material is a technique described many years ago. Reports show that fat tissue was first used in 1893 by Neuber for the correction of facial defects, whereas its use for breast padding was reported at the end of the 19th and beginning of the 20th century.<sup>7</sup> In the field of

plastic surgery, studies describe the predominant use of abdominal fat tissue for remodeling facial contours, as well as for rejuvenation of the face by correcting deformities in periorbital and malar regions, including craniofacial defects.<sup>7-9</sup>

In dentistry, BFP has been used for the closure of oroantral fistulae because of its vast plexus of blood vessels, which facilitate the local anastomosis. In addition, this tissue is easily obtained and is usually located close to the site to be relocated when the defect is in the superoposterior region.<sup>10,11</sup> Its use has also been reported as a graft in sinus elevation surgery for implant placement and treatment of class II furcation lesions.<sup>6,12-14</sup> However, the treatment of peri-implant mucosal defects through a volume increase has not yet been described in the literature.

Subepithelial connective tissue grafts are a common therapeutic alternative for defects in peri-implant soft tissues. Because of its broad indication, the technique using connective tissue grafts has been widely applied despite the need for another surgical site, which prolongs operative time and increases morbidity and discomfort during the patient's recovery.<sup>4,5</sup>

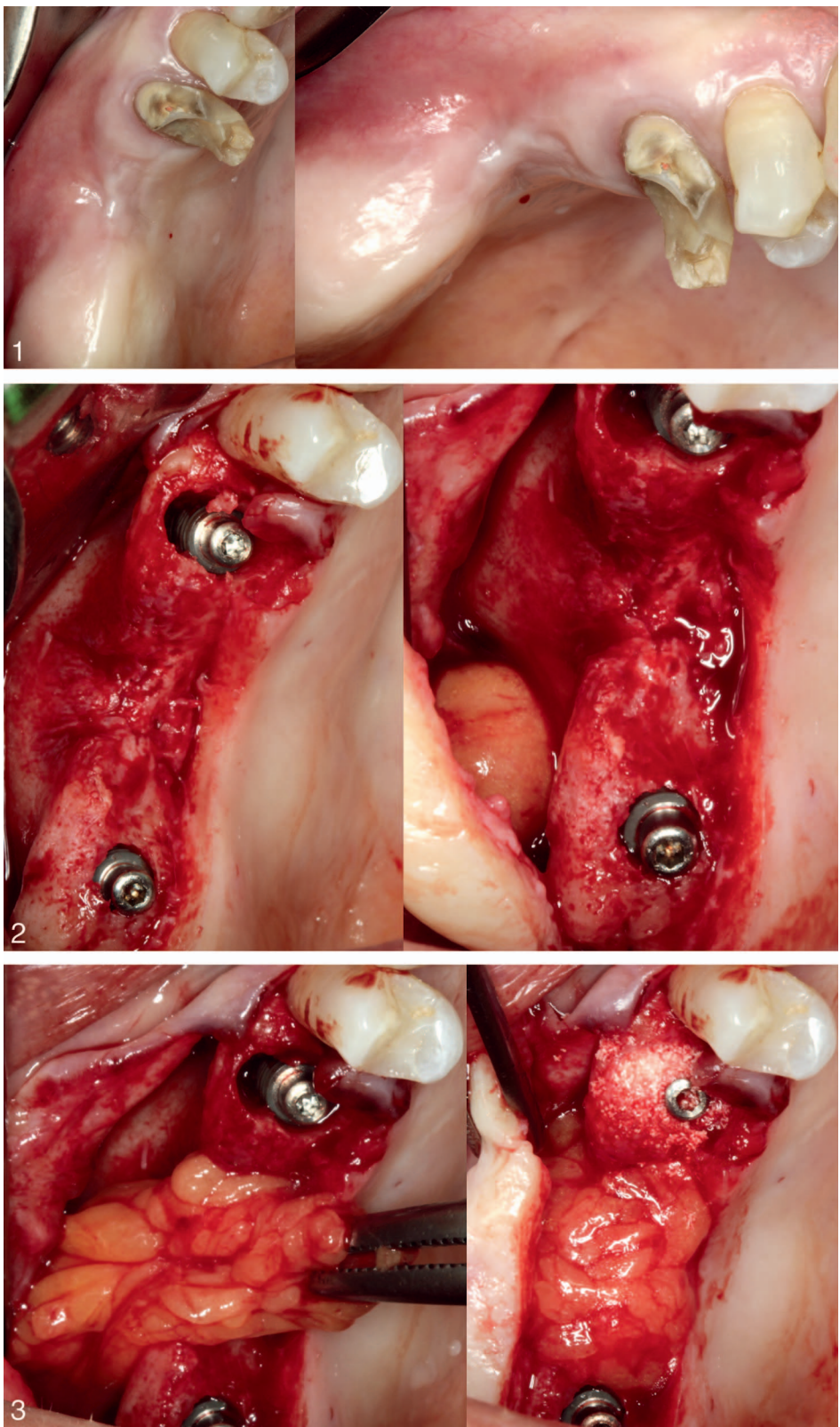
Anatomically, the BFP is found in the jugal mucosa and consists of a main body with four extensions: jugal, pterygoid, superficial temporal, and deep temporal. The jugal is located more superficially, a fact that makes surgical access easier. The main body is located laterally to the buccinator muscle and to the anterior border of the masseter muscle. The pterygoid extension is closely related to the medial and lateral pterygoid muscles. The temporal extension is located between the zygomatic arch, greater sphenoid wing, temporal tendon, and temporalis muscle. It plays a mechanical role and serves as a cushion, facilitating the movement of a muscle in relation to another during suction and mastication.<sup>15</sup> Therefore, use of BFP may have advantages, including the fact that it does not require a second surgical site when the area to be treated is located in the maxillary posterior region—greater biocompatibility because it is an autogenous graft, has a lower cost and a shorter operative time. Because it is a pedunculated graft, the prognosis and predictability are better as the greater flow of nutrients from the pedicle favors the process of remodeling and incorporation.<sup>7,15-18</sup>

The theory underlying the possible use of BFP for filling peri-implant mucosal defects is the process of metaplasia, which is the differentiation of an adult tissue into another tissue of the same lineage. We have worked with two different types of connective tissue for this purpose. Although the tissues have the same embryonic origin (ie, mesoderm), the process can take from 3 to 6 weeks.<sup>16</sup>

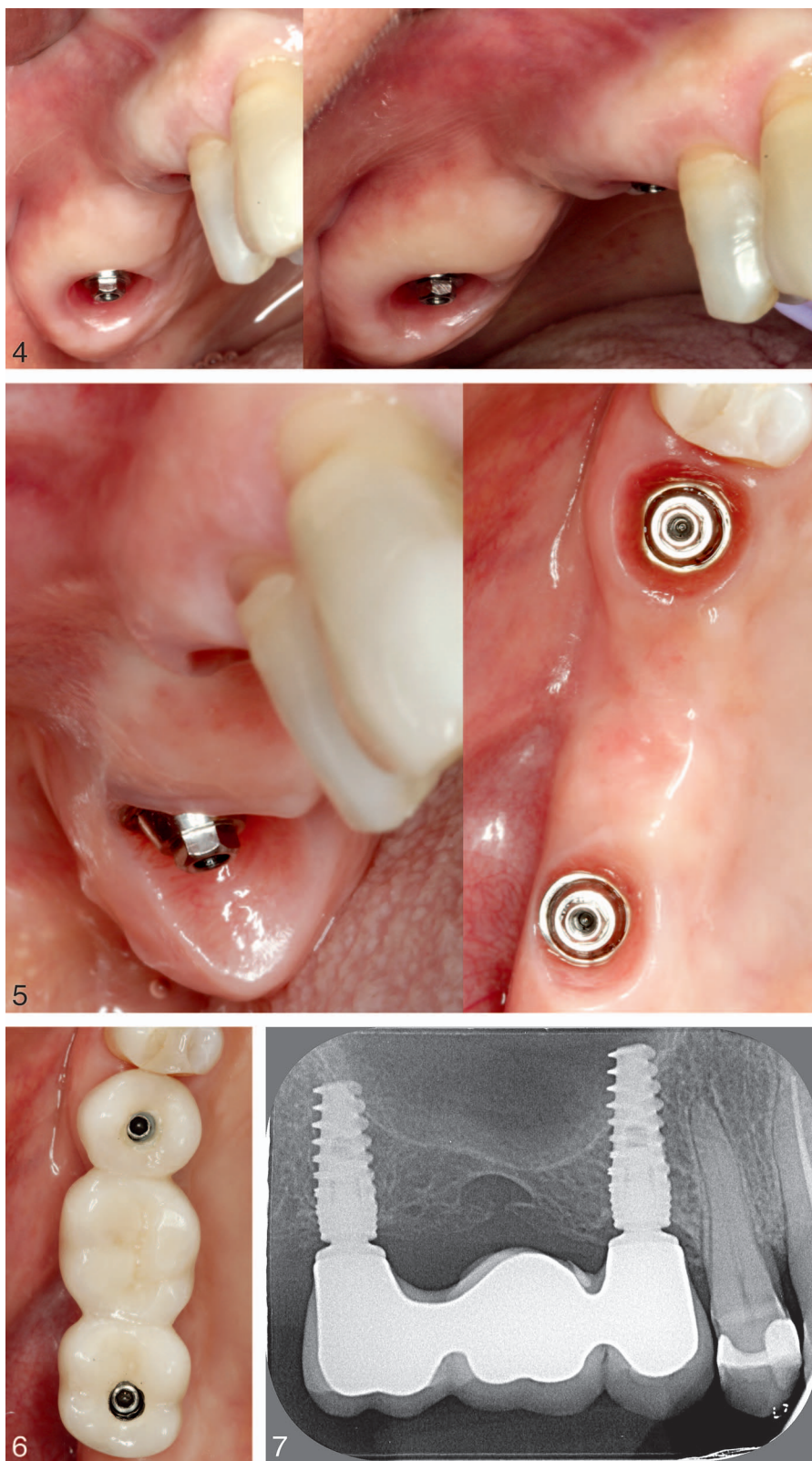
Since this is the first case report of the use of BFP, further studies are needed to compare the results of BFP and subepithelial connective tissue, despite the large number of publications on the use of fat tissue for other purposes.

## CONCLUSION

In the present case report, satisfactory gain in mucosal volume and its maintenance in the treated area were observed after 5 years of follow-up, suggesting that this technique may be a safe therapeutic alternative for the treatment of peri-implant mucosal defects in maxillary posterior areas.



**FIGURES 1–3.** **FIGURE 1.** Change in tissue contour in the region corresponding to tooth #3. **FIGURE 2.** Immediate implant placement at the extraction site of tooth #4 and in the region of tooth #2. Periosteal incision on the buccal flap in the region of tooth #2 to gain access to the buccal fat pad. **FIGURE 3.** Divulsion and pulling of the buccal fat pad to accommodate it on the bone ridge.



**FIGURES 4–7.** **FIGURE 4.** Soft tissue contour after 60 days. **FIGURE 5.** Clinical control after 5 years. Note the vertical and horizontal maintenance of mucosal tissue volume. **FIGURE 6.** Clinical control after 5 years. **FIGURE 7.** Radiographic control after 5 years.

### ABBREVIATIONS

BFP: buccal fat pad

CBCT: cone beam computed tomography

### NOTE

The authors declare no conflict of interest.

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