Bull Tokyo Dent Coll (2012) 53(3): 127–132

Case Report

Autogenous Bone Graft Combined with Buccal Fat Pad as Barrier in Treatment of Class II Furcation Defect: A Case Report

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Received 10 January, 2012/Accepted for publication 27 April, 2012

Abstract

The treatment of furcation defects is a complex and difficult task that may compromise the success of periodontal therapy. Here we report a new clinical treatment of a Class II furcation defect using an autogenous bone graft associated with a buccal fat pad (BFP) used as a membrane. The surgical treatment was performed following initial periodontal therapy. Post-operative follow-up appointments were performed at 3, 7, and 12 months. Clinically, after 3 and 7 months, a reduction in probing depth without bleeding on probing and an increase in vertical and horizontal clinical attachment level were observed. After 7 post-operative months, an increase in keratinized gingiva was observed. Radiographically, a significant improvement was noted, with the furcation defect almost completely closed. These results could also be observed after 12 postoperative months. It can be concluded that the combined use of autogenous bone graft and a BFP yielded clinically favorable outcome in the treatment of a mandibular Class II furcation defect.

Key words: Grafting bone — Furcation defects — Adipose tissue — Barrier

Case Report

A 49-year-old female patient was evaluated at Positivo University and referred to the Clinic of Specialization in Periodontics. Her anamnesis revealed no systemic health problems or deleterious oral habits. Through radiographic (Fig. 1a) and clinical (Fig. 1b) examinations, the presence of a Class II furcation defect at the buccal surface of tooth #46 was diagnosed. The buccal surface of the tooth exhibited bleeding on probing and a 7 mm probing pocket depth. In addition, a vertical and horizontal attachment loss of 10 mm and 6 mm, respectively, was present. Neither increased mobility nor premature contacts were seen. The patient did not complain about painful sensibility. The tooth had

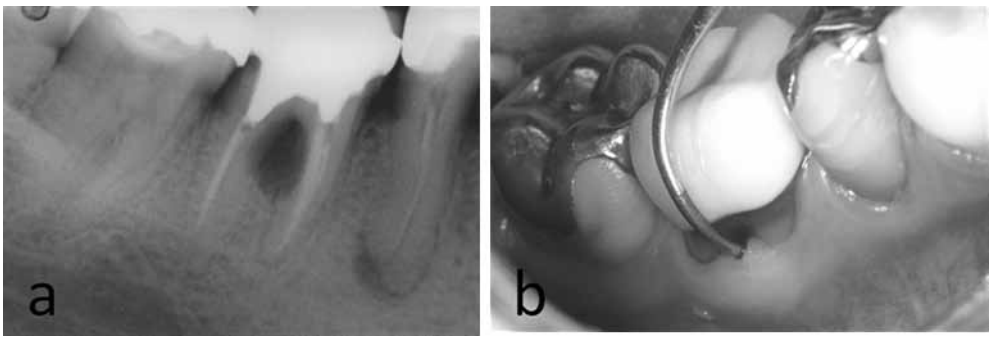

Fig. 1 a: Initial radiographic aspect of tooth, b: initial clinical aspect of tooth
Presence of Class II furcation defect at buccal surface of tooth #46 was diagnosed.

Fig. 2 Aspect of tooth after scaling and root planing

a maladapted fixed partial denture (custom-made metallic cast post-and-core and metallic-ceramic crown) installed about 20 years ago, and an overcontour was detected. This denture was probably the etiologic factor that initiated the furcation lesion, because it allowed the local accumulation of biofilm. The proposed therapy comprised the treatment of the Class II furcation lesion using guided tissue regeneration (GTR).

The patient authorized the treatment to be performed and the use of images taken during treatment and follow-up appointments. The patient received initial periodontal therapy, including oral hygiene instructions and subgingival scaling and root planing on tooth #46. Four weeks later at her re-evaluation, good plaque control and no signs of active inflammation were observed and the surgical treatment was performed. Extra- and intraoral asepsis was achieved by administration of polivinilpirrolidone-iodine (PVP-I) and 0.12% chlorhexidine digluconate, respectively, followed by inferior alveolar nerve block with 2% mepivacaine cloridrate containing 1:100,000 adrenaline. An intra-sulcular incision from the mesial surface of tooth #47 to the distal surface of tooth #45 and two relaxing incisions were made using a 15c blade and scalpel. A total flap was raised at the buccal surface. Following this, root scaling and planing were performed in the furcation area using periodontal curettes (Fig. 2). An inverted cone diamond bur on high speed was used to remove the buccal overcontour of the metallic-ceramic crown. The tooth was conditioned with tetracycline hydrochloride solution (500 mg capsule diluted in 5 ml saline). The root surface was conditioned to decontaminate the area and remove the smear layer, thereby exposing the collagen fibers[6].

Once the receptor site was prepared, the autogenous bone graft was collected from the patient's right maxillary tuberosity. Next, part of the buccal fat pad (BFP, 1×1 cm) was removed to be used as a membrane. The BFP is located within the masticatory space and is in intimate association with the muscles of mastication. The BFP consists of an encapsulated central body (corpus) with four extensions: buccal, pterygoid, superficial, and deep

Fig. 3 Access and removal of BFP

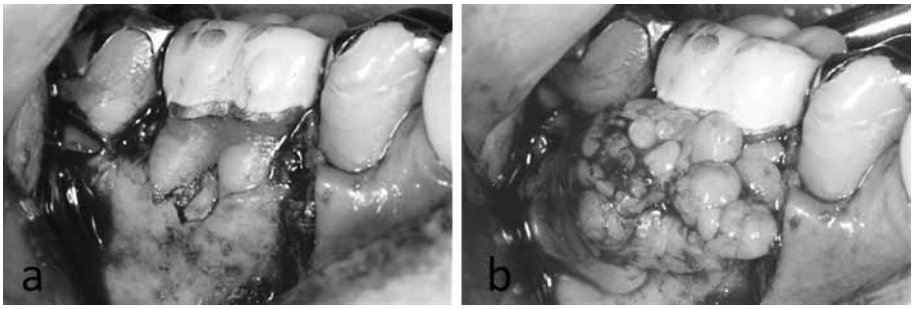

Fig. 4 a: Autogenous bone grafted in furcation defect region, b: placement and suture of BFP to be used as membrane

temporal. The corpus lies along the anterior wall of the masseter muscle and against the periosteum of the posterior wall of the maxilla. The corpus and the buccal extension account for 50% of the BFP and are the most clinically significant portions[5].

This was executed by a 2 cm incision with 15c blade at the bottom of the vestibule in the area of the right maxillary second molar. The area was carefully dissected to avoid vascular plexus contact. When visualized, the buccal portion of the BFP was moved with caution with the aid of surgical hemostatic pliers (Fig. 3) and part of the tissue was removed with Goldman-Fox scissors. The fat pad remnant was returned and the incision was sutured with 4.0 silk thread, using simple interrupted sutures.

Autogenous bone was immediately grafted after its removal inside the Class II furcation defect (Fig. 4a) and the BFP was placed and sutured over it with 5.0 Vycril (Fig. 4b). The fat pad used as membrane was positioned 2 mm further, at the mesio-distal and crown-apex direction of the defect. The flap was coronally positioned and sutured with suspensory sutures using 5.0 Vycril. The relaxing incisions were sutured using 5.0 Vycril with interrupted sutures. Other suspensory suture was performed with 4.0 silk thread for stabilizing the flap (Fig. 5).

Postoperatively, Nimesulide (100 mg pills) every 12 hrs for 3 days; Amoxicillin (500 mg capsules) every 8 hrs for 7 days; and 0.12% chlorhexidine digluconate (mouth rinse) for 1 min every 12 hrs for 10 days, were prescribed. The sutures were removed on the 10th postoperative day. The patient reported a slight swelling in the first 3 postoperative days at the donor site.

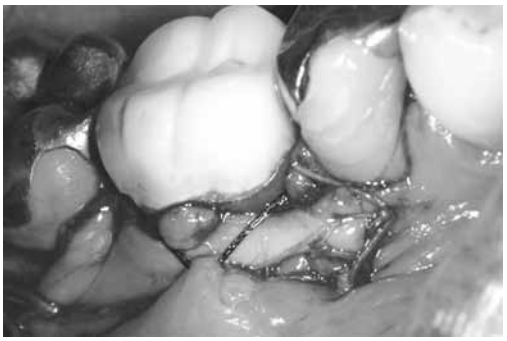

Fig. 5 Suture of flap
Suspensory and interrupted sutures were performed.

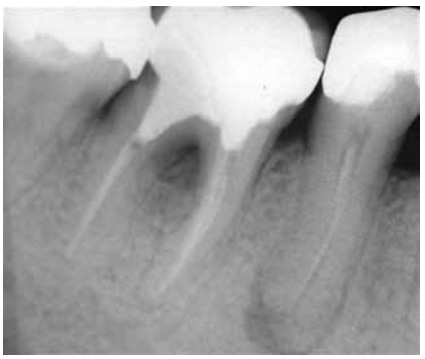

Fig. 6 Radiographic aspect of tooth after 3 postoperative months

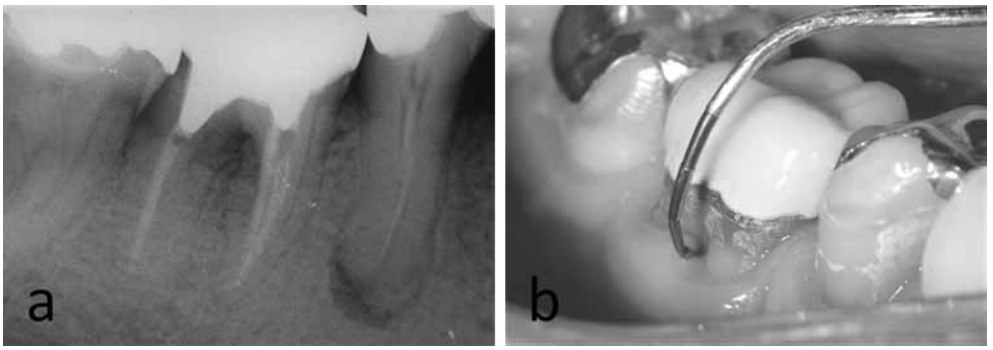

Fig. 7 Radiographic (a) and clinical (b) aspects of tooth after 7 postoperative months

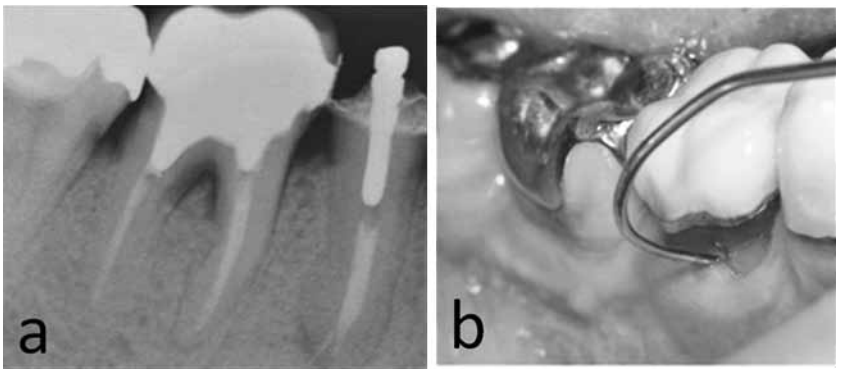

Fig. 8 Radiographic (a) and clinical (b) aspects of tooth after 12 postoperative months

Periapical radiographs were obtained at after 3 (Fig. 6), 7 (Figs. 7a and b), and 12 (Figs. 8a and b) postoperative months. After 7 and 12 postoperative months, the tooth exhibited a 2 mm depth probing, without bleeding on probing, and 5 mm of clinical attachment level. Radiographic examination showed a very significant improvement compared to

baseline, presenting an almost complete bone closure of the furcation defect. At 7 postoperative months, the keratinized gingival zone increased and a 4.5 mm increase in horizontal clinical attachment could be seen (Fig. 7b). These results could also be observed after 12 postoperative months (Fig. 8b).

Discussion

The regeneration of attachment lost due to periodontal disease is one of the main goals of periodontal therapy[10]. Among regenerative therapies, GTR is used in the treatment of 2- and 3-wall infrabony defects[3] and Class II furcation defects[12], showing predictable results. Treatment of Class II furcation defects using GTR has presented a more favorable prognosis than surgical debridment[1,10]. The association of membranes with graft materials for the treatment of furcation defects intensifies the regenerative results when compared to the use of GTR alone[1]. Traditionally, the gold standard for osseous regeneration has been autogenous bone.

Either absorbable or nonabsorbable membrane can be used in GTR. Absorbable membranes have been manufactured with polylactic acid, copolymers of polylactic and polyglycolic acid, bovine collagen, dura mater, and autogenous connective tissue barriers[2]. Another alternative for autologous membrane has been the use of Bichat's ball, also known as the BFP. There have been reports of its successful use in the treatment of oral sinus communications[8]. Recently, the clinical use of Bichat's ball in the treatment of gingival recession was reported[5]. To our knowledge, there are no previous reports in the literature on the use of Bichat's ball/BFP in the treatment of periodontal bone defects.

In this case report, the furcation defect was Class II and was treated by autogenous bone graft collected from the maxillary tuberosity with the BFP used as a membrane. This association showed a favorable clinical result, with a 5 mm reduction in probing depth, 5 mm increase in vertical clinical attachment, 4.5 mm increase in horizontal clinical insertion, and an almost total closure of the furcation defect. Moreover, an increase in keratinized gingiva was observed after 7 postoperative months.

The option for collecting the tuberosity bone was chosen due to the ease of using it. Also, the bone donor site was close to the fat pad donor site, thus favoring a smaller morbidity. Moreover, the autogenous bone amount required was small because of the size of the furcation defect. Although the maxillary tuberosity bone is composed of marrow bone and fat tissue, with less vital bone[4], a satisfactory result for bone closure of a Class II furcation defect was observed.

The results obtained in this case report showed that the use of the BFP as a barrier is a new treatment option, because a favorable clinical result was achieved. However, to our knowledge, there are no earlier reports in the literature on the use of a fat pad as a barrier to achieve regeneration in periodontal bone defects. Further histological studies are necessary to determine whether an authentic periodontal regeneration occurred, new connective tissue attachment, or just repair.

The results presented in this case report may probably be justified because the fat tissue is a source of stem cells[11], containing progenitor mesenchymal cells that may be used in tissue engineering for bone regeneration[9]. These cells have the ability to differentiate into osteoblasts, indicating their potential in human bone tissue engineering. In this case report, both the BFP and the tuberosity bone contained fat tissue.

Histologically, the BFP is characterized by the presence of conjunctive tissue with adipose cells and the absence of lining epithelial tissue[5]. Considering the study by Melcher[7], who stated that the cell type repopulating the root surface is the one that will determine the attachment insertion to be formed, the fact that Bichat's ball does not contain epithelial tissue is an advantage, since this tissue is not desirable for regeneration.

It can be concluded that the association of an autogenous bone graft from the maxillary tuberosity with BFP is an autologous treat-

ment option with satisfactory clinical results for treating mandibular Class II furcation defects.

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