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# Buccal Pad of Fat; An Asset for Oral-Maxillofacial Region- A Series of 12 Cases

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**ABSTRACT**
*The buccal fat pad flap (BFP) is considered to be an undemanding, simple yet dependable flap for the treatment of defects of oral cavity owingto its rich blood supply and location, which is proximal to the location of various intraoral defects. In this article, we present twelve cases of reconstruction with BFP and review its associated anatomical background, surgical techniques, and clinical applications. We believe that the BFP has shown a high success rate in various clinical applications, including the closure of carcinomas, oroantral communication central giant cell granuloma and oral submucous fibrosis as well as have a simple surgical procedure. However, the control of etiologic factors, size of defect, anatomical location of defect, general condition of patient and compliance could influence the prognosis after grafting. In conclusion, BFP is a reliable flap that can be used on various clinical defects of oral cavity.*
***Keywords:*** *Reconstruction Surgery, oral cavity, reconstruction techniques, Maxillofacial defects, Maxillofacial Reconstruction*

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## INTRODUCTION

Covering or reconstructing oral defects is a crucial step for effective wound healing and rehabilitation since tissue abnormalities in the oral cavity can be brought on by a range of illnesses and problems such as trauma, tumours, cysts, clefts, or fistulas. Unlike other extraoral wound locations, the soft tissue covering the alveolar bone in the oral cavity wound is rather thin, and the gingiva lacks a fatty layer.As a result, vascularized skin grafts are typically overly bulky. Additionally, the skin graft's tone and texture do not coincide with those of oral mucosa. The free palatal mucosal grafts match the gingiva in colour and thickness, but their usage was constrained by the palatal mucosa's small size and dimensions[1-3].Heister introduced the term "buccal fat pad" into literature in 1732, and Bichat improved upon it in 1802, although solely as an anatomical component. Egyed was the first to describe using BFP in oral reconstruction to close oroantral and oronasal connections. Tideman et al. demonstrated that when utilised for deformities in the oral cavity, BFP did so not require covering by a skin graft [4-7].

Multiple oral and maxillofacial abnormalities can be repaired with the buccal pad of fat. Buccal fat pad first forms during three months of pregnancy and continues to expand until delivery. Following that, the volume of buccal fat only slightly varies with age, by around 10mL[8]. Due to the straightforward surgical procedure for grafting, the proximity to the recipient location, the minimal donor morbidity, and the rich vascularity of BFP, a high success rate has been documented in the literature[9,10].Anatomical Background:- The buccal fat pad protrudes from the anterior mesenteric border and continues into the duct of the parotid, where the buccopharyngeal fascia supports it and covers the buccinator muscle. It is a movable structure made up of lobes. The primary body plus the buccal, temporal, pterygopalatine, and pterygoid extensions make up the buccal pad of fat. The major body of the fat pad is surrounded by the masseter muscle, buccinator muscle, and zygomatic arch. A very thin capsule protects BFP.At the anterior BFP boundary, the Stenson's duct pierces the buccinator. The weight is 9.3g and the average volume is 9.6 ml (range: 8.3ml to 11.9 ml) (range: 8ml to 11.5 g). When properly dissected, it offers a 6x5x3 cm graft. Using a 6 mm thick material, a 10 $cm^2$ area may be covered.The abundant vascularity of the BFP is facilitated by the superficial and deep temporal arteries and maxillary artery. A dense capillary network found inside the capsule covers the fat pad. After entering the capsule from various angles, arterioles create a capillary plexus. Blood from BFP is drained through the facial vein[11].We are presenting our

experience with the pedicled BFP flap for intraoral reconstruction through 13 different cases with oral defects in this article.

Surgical approach:

To prevent injuring Stensen's duct during the surgery, local infiltration with lidocaine (1%) and 1:100,000 epinephrine was carried out first, followed by identification of the duct with a lacrimal probe before incision. Across the resection field or by making an incision through the superior vestibular sulcus, the BFP flap was removed. The buccinator fibres and mucosa are cut open to reveal the BFP and maxillary periosteum. Its fascia was severed, and the fat pad was pulled into the mouth while being pushed beneath the zygomatic arch by the cheek skin. With the use of tissue forceps, the flap was pulled, rotated, or moved onto the defect, then loosely sutured. Following surgery, physical rehabilitation was advised for four to six weeks

**CASE REPORTS**

**CASE 1**- A 40 years old male presented to the oral and maxillofacial surgery department with the primary complaint of non-healing ulcer in both left and right back tooth region. Clinical and histopathological examination revealed it to be squamous cell carcinoma of right posterior maxillary and mandibular alveolus for which wide excision, segmental mandibulectomy, maxillary alveolectomy, R-MRND and reconstruction with a buccal pad of fat and sternocleidomastoid flap was done. The patient was further subjected to radiotherapy. Follow-up was done for the next two years during which duration the patient remained disease-free. [Fig. 1;a-b]

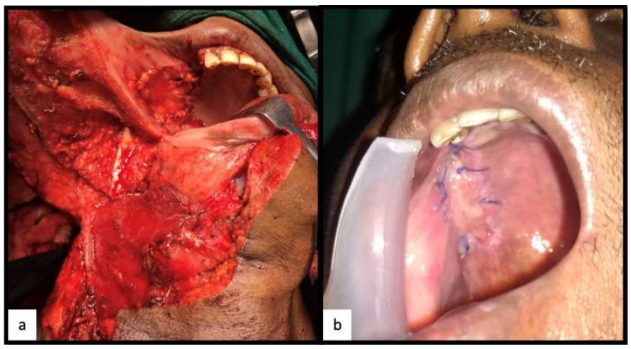


Fig.1;a Intraoperative view of resection and reconstruction with buccal pad of fat.
Fig.1;b Post-operative pic of site reconstructed with buccal pad of fat.

**CASE 2**- A male patient of 43 years reported the chief complaint of an ulcer on the left side of his gum for one year. This lesion was histopathologically confirmed as verrucous carcinoma of right side posterior alveolus of the lower arch. Wide excision followed by reconstruction with a buccal pad of fat was done. The flap was mobilized through the defect site in the buccal mucosa by blunt dissection rather than the usual technique of maxillary vestibular incision. No reoccurrences were noticed in a year-long follow-up period and the flap showed complete reepithelization. This case exemplifies the versatile nature of the buccal pad flap for the reconstruction of deficiencies in the posterior mandibular vestibule region. [Fig-2; a-c].

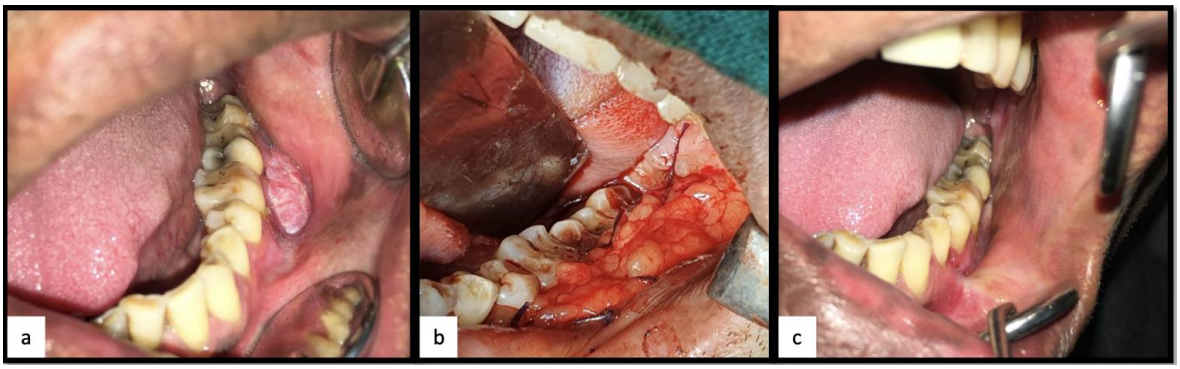


Fig. 2;a Preoperatively picture showing verrucous carcinoma in left mandibular alveolus.
Fig. 2;b Reconstructed site with buccal fat pad
Fig. 2;c Reconstruction of defect with buccal pad of fat.

**CASE 3**- A female patient of 23years reported to the department with main complaint of growth in the palate on right side. This was clinically examined and histopathologically reported as central giant cell granuloma of the maxilla, leading to grade one mobility of 13,14,16 and grade three mobility of 15. Wide excision with curettage and peripheral ostectomy along with the extraction of 15 was done and the defect was reconstructed with a buccal pad of fat. [Fig. 3]

Fig. 3 Reconstruction of defect post resection of central giant cell granuloma

**CASE 4 to 11**- We have used a buccal pad of fat in 8 cases of oro-antral communication. In one of the cases, an oroantral communication was formed after the extraction of 26 for which primary closure was done with a buccal advancement flap. Due to the failure of the earlier procedure the patient again reported the complaint of oroantral communication for which a buccal pad of fat was taken for the reconstruction. The [Fig-4; a-b]

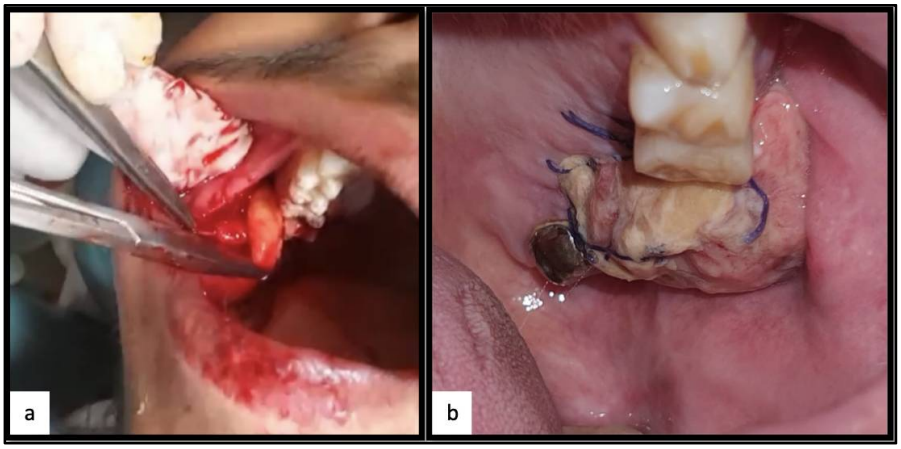


Fig.4;aMobilization of buccal pad of fat for oro-antral communication.
Fig.4;bReconstruction of site with oroantral communication

**CASE 12**- A female patient with 47years age reported to the oral and maxillofacial surgery department with reduced mouth opening and was diagnosed with oral submucous fibrosis. Surgical excision of the fibrotic bands was followed by using a buccal pad of fat for reconstruction. [Fig.-5]

Fig. 5 Use of Buccal pad of fat after surgical excision of fibrotic bands in oral submucous fibrosis

**Case 13**- A male patient of 45 years reported with a white painless no scrapable patchy lesion in the oral cavity for 5-6 months. This was then diagnosed as verrucous leukoplakia for which excision followed by reconstruction with buccal fat was done under Local anesthesia [Fig-6; a-b]. Two months follow-up revealed that although the flap adapted well and epithelized, the mouth opening of the patient was reduced from 3.4cm preoperatively to 1.4mm [Fig-7; a-b] at two months follow-up. However, the patient admitted to not performing mouth-opening exercises.

**DISCUSSION**

The buccal fat pad has a big impact on how the cheek and face are shaped. The optimal flap has high vascularity, low donor site morbidity, and easy mobility. Although the BFP's unexpected size is a drawback, preoperative assessment of the BFF volume using magnetic resonance imaging enables surgeons to assess before deciding on a course of therapy[12].

The buccal and deep temporal arteries from the maxillary artery, the transverse artery from the superficial temporal artery, and small arteries from the facial artery are thought to be the BFPs' at least three sources of blood supply, even though anatomists have described the blood supply to the BFP in a variety of ways. Since the tiny arterioles and venules in the flap base form some of BFP's vascular intake and outflow, which is partly transferred from the transverse facial artery in an axial pattern and partially as a random mesenchymal pattern, extreme caution should be taken to maintain a wide base of the flap. The great success rate and rapid epithelialization of the flap are thought to be largely attributable to the abundant blood supply[13].To prevent a free fat graft, that might inevitably result in a failed flap or its partial dehiscence, most authors agree to handle the flap gently and preserve the pedicled pad's thickness throughout the fat pad flap transfer. This has been described in earlier early research[14-16].

As shown in the cases above, the BFP was effective for immediate reconstruction of small to medium-sized defects of the oral cavity. Even this did not adversely influence the sequelae of the flap. Based on these observations, the authors believe that small to medium oral defects affect the maxilla, palate, and buccal mucosa of the mouth. A better outcome can be achieved using the buccal fat pad graft that is pedicled which is an effective and less invasive procedure than other surgical techniques. BFPs are ideal because they are easy to mobilize, provide excellent blood supplies, and have least donor-site morbidity. However, application of grafting is limited due to less volume and shorter length of the pedicled BFP flap. Unilateral BFP flaps can close defects with a maximum diameter of 4 centimetres in the midline of the maxilla[17].

It is very challenging to reconstruct oral cavity defects after resectioning of oral squamous cell carcinoma without any complication. The use of a buccal pad of fat for the reconstruction as an adjunct has proven to be a boon for the same. Post-operative healing in both cases of carcinomas was excellent. No postoperative complications like pain, trismus etc were seen. As it is locally available, no secondary surgical site was required which again proves its efficacy. Even postoperative radiotherapy didn't delay the healing with BFP [18].

Essentially, an oroantral fistula means that the oral cavity and the maxillary antrum are in a state of patent communication. It is usually associated with a dental implant or the removal of a tooth in a maxillary molar or premolar area. In cases of Oro-antral communication, the regurgitation of liquids and

food into the maxillary sinus may result in sinusitis thus making the reconstruction of the defect necessary. Frequently-used flaps for closure of Oro-antral communications are rotational palatal flap or buccal advancement flap. The buccal advancement flap may lead to Vestibular swallowing. Certain limitations of the buccal advancement flap are as it cannot be used in case of damage to the gingiva and previously attempted cases for closure. In our above-mentioned cases, the use of BFP shows excellent results. Furthermore, BFP grafting is a fairly straightforward method for treating oroantral fistula and requires less time to master[19].

In another case of central giant cell granuloma (case 3), BPF has again proven its utility in the reconstruction of a maxillary defect of approximately 2.5 cm and has proven a boon for such a young patient, who was scared of the second surgical site. Postoperatively, no complications were seen and healing was uneventful.

Despite BFP's high success rate in closing oroantral fistulas, dental implants are not recommended or indicated in the reconstructed defect area since dental implants do not stimulate bone growth. Although it still can be used with proper bone graft materials.

Other applications :

Due to the anatomical proximity of BFP, it has been widely as an interposition material in TMJ reconstructive surgeries. being a stable graft in TMJ, the BFP flap can be visualized on MRI 1 year postoperatively. The upper lip may lessen natural concavity in individuals undergoing maxillary advancement surgery by LeFort I osteotomy. BFP can be used as an augmentation material to recuperate the upper lip profile[20].Following the removal of the parotid gland, BFP can be utilised to avoid Frey syndrome[21]. The flap can be utilised to repair the maxillary sinus membrane's perforation during dental implant surgery[22].

## CONCLUSION

It is an ideal flap to reconstruct small to moderate oral and maxillofacial defects due to its easy accessibility, excellent vascularity, and minimal morbidity at the donor site.It is evident from the above series of cases that the BFP technique can be used to reconstruct surgical defects resulting from ablation of malignancies of the palate of moderate to high grade.In addition, postoperative radiotherapy had no impact in the healing process and survival of the flap. In a poorly vascularized recipient bed, BFP's rich vascularity can be an advantage. However, the limited volume of graft constrains its use in large defects. It is possible to cause facial disfigurement and mouth opening limitations by removing too much buccal fat pad. When applying BFP in clinical settings, it is important to consider both pros and cons.

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