

Buccal Fat Pad to Repair Intraoral Defects

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Abstract- The buccal fat pad (BFP) originally described as an anatomic structure without any obvious function. For a long period it was considered to be a surgical nuisance. However during the past three decades, the BFP has become a well-established tool in oral and maxillofacial surgery for reconstruction of small to medium sized acquired or congenital soft tissue and bone defects in the oral cavity.

The aim of present article is to review the database available regarding BFP, including its anatomy, clinical usage, success and complications and to ascertain the reason for its preference over other modalities in various applications in oral surgery.

Index Terms- oral and maxillofacial surgery, buccal fat pad, acquired or congenital defects

I. INTRODUCTION

The buccal fat pad (BFP) was first mentioned in 1732 by Heister¹ and better described by Bichat² in 1802. Egyedi³ was the first to report use of buccal fat pad (BFP) in oral reconstruction for the closure of oroantral and oronasal communications and Tiedman⁴ et al showed there was no need to cover BFP by a skin graft when used for defects of oral cavity.

Literature reports have illustrated that the BFP can be used as a pedicled graft for the closure of maxillary defects^{5, 6}. It has more recently achieved great importance in the field of aesthetic facial surgery with special regard to the modification of facial contours and the malar prominence. During the past 3 decades, the BFP has become a well-established tool in oral and maxillofacial surgery for reconstruction of the intra-oral surgical defects.

Anatomical considerations:

The BFP is a simple lobulated mass described as consisting of a central body and 4 extensions : buccal , pterygoid , pterygopalatine and temporal. The body is centrally positioned and is located above the parotid duct and extends along the anterior border of masseter muscle. It courses medially to rest on the periosteum of the posterior maxilla and overlies the uppermost fibres of buccinator muscle. Posteriorly it travels through the pterygoid maxillary fissure in contact with the maxillary artery⁷.

The BFP derives its blood supply from the buccal and deep temporal branches of the maxillary artery, transverse facial branches of the superficial temporal artery and branches of the facial artery. Owing to its rich blood supply, it can be considered as a pedicled graft with an axial pattern^{7, 8}.

II. FUNCTIONS

Possible functions of the BFP are:

To fill the masticatory spaces, acting as cushion for the masticatory muscles, to counteract negative pressure during suction in a newborn, and as a rich venous net, with valve like structures, possibly involved in the exo-endocranial blood flow through the pterygoid plexus⁸.

Average weight – 9.3g (8-11.5g)
Average volume – 9.6ml (8.3-11.9ml)
When properly dissected and mobilised, the BFP provides a 6x5x3 cm pedicled graft
Buccal extension –largest 30-40%
Body -25-30%
Pterygoid and temporal extension inconsistent.

Surgical approaches to harvest BPF

1st approach- An incision through the mucosa on the buccal aspect of the vestibule in the molar region.

2nd Approach- A vertical mucosal incision slightly lateral to the anterior margin of the ascending ramus (fig 4).

3rd Approach – elevate mucoperiosteal flap in the molar region on the lateral aspect of the maxillary alveolar process and incision of the periosteum at the level of buccal sulcus (fig5) suggesting a high success rate of BFP in the closure of Oro Antral Communication (OAC). However a few complications, such as mild obliteration of vestibule and recurrence of OAC, in up to 7.5% were reported in

one study. The vestibular depth became normal in due course of time resulting in no postoperative prosthodontics complications. Recurrent OAC needed a second operation to achieve closure.

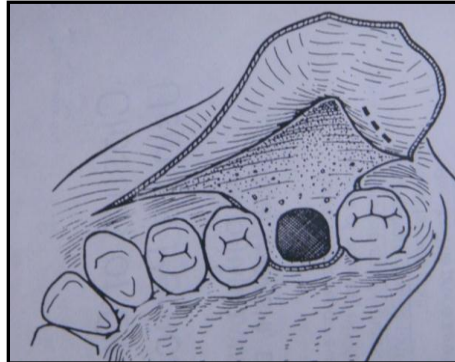


Figure 1) Mucoperiosteal Flap Design

BFP IN CLOSURE OF MUCOSAL DEFECTS: the BFP has also been used to cover the mucosal defects after excision of the mucosal pathologies. The epithelisation of the flap has been found to be satisfactory at 4-6 weeks (fig 11-15) showed reconstruction of the cheek mucosa with BFP after excision of the leukoplakia.

The Other Uses of the BFP

Beside the above mentioned procedures the BFP can also be used

- a) In treatment of oral submucous fibrosis
- b) In repair of primary cleft palate
- c) In temporomandibular joint reconstruction
- d) As membrane in sinus floor augmentation



Figure 2: Leukoplakia in Cheek



Figure 3: Buccal pad of fat

Figure 4: Suturing of BFP

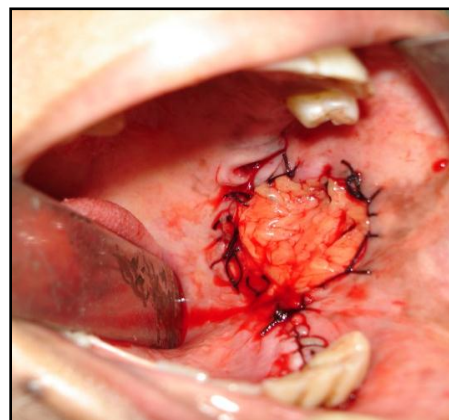




Figure 5: 10 days Post-Operative



Figure 6: 3 months post operative

III. DISCUSSION

Intra-oral defects may be obturated with prosthesis or closed with local flaps such as a buccal advancement flap, a palatal pedicled flap, or double layered closure flaps using buccal and palatal tissues^{9,10,11,12}. However the aforementioned procedures produce large denuded areas; result in decrease of vestibular sulcus and cannot be used to close large defects¹³. Regional flaps (tongue, temporalis muscle or nasolabial flaps etc.) have also been successfully used for intraoral reconstruction but, they are generally preferred for defects of much larger dimensions. In recent years, the use of BFP has gained popularity in the closure of oro-antral communications reconstruction of secondary to maxillary cyst defects and intra-oral tumor resections⁹⁻¹¹.

A retrospective study of 100 patients compared the BFP with nasolabial flap, tongue flap, and split skin graft for the coverage of postfibrotic band incision in oral submucous fibrosis with 25 patients in each group¹⁴. The authors concluded that the BFP serves as the best substitute, providing excellent function without deteriorating esthetics. It offered ease of surgery, little postoperative morbidity, and good patient acceptance. Levi et al. has innovated the use of pedicle BFP in conjunction with the Furlow repair and the hard palatal 2-flap procedure for closure of primary cleft palate, citing less dissection and reduced donor site morbidity of this material for their choice¹⁵. Pappachan and Vasant pedicled the BFP in conjunction with pedicled mucosal flaps and reported that the BFP helps to lengthen the soft palate without generating tension on the nasal side¹⁶. Rattan used the BFP as a useful adjunct to autogenous or alloplastic temporomandibular joint (TMJ) reconstruction after TMJ ankylosis release and multiple operated joints¹⁷. The rationale for placing fat around the joint is to obliterate dead space around the joint, thus preventing the formation and organization of hematoma. Hassani et al. used the BFP and performed sinus augmentation with a mixture of autogenous bone and natural bone mineral, covering the lateral sinus wall with the BFP¹⁸.

Size limitations of BFP must be known in order to provide successful outcome. Rapidis et al¹⁹. have stated that in maxillary defects measuring more than 4x4x3cm, the possibility of partial dehiscence of the flap is high due to the impaired vascularity of the stretched ends of the flap. In buccal or retromandibular defects up to 6x5x3 cm, reconstruction is accomplished due to the underlying rich vascular bed. Baumann and Ewers²⁰ have stated that it is very important to preserve the thin capsule of the BFP in order not to damage the small blood vessels. To date, reported complications with the use of the BFP flap are hematoma, partial necrosis, excessive scarring, infection or facial nerve injury²¹. The use of the BFP in patients with prior local radiotherapy, malar hypoplasia, thin cheeks or Down's syndrome is contraindicated^{6,13,19}.

IV. CONCLUSION

The success rate of BFP in the reconstruction of oral defects is quite high^{9,10,13-16}. The technique is so simple that it has been performed by different surgeons in a very highly successful way. However, factors such as careful manipulation of the flap, knowledge of its size limitations, and correct incision and sutures used must be taken into consideration. The rich blood supply of the BFP and its easy mobilisation and fewer complications make it an ideal flap. Furthermore, the BFP is located closely to the defect to be covered diminishing the risk of infection. Its sole disadvantage is that it can only be used once⁶. However, if properly applied in selected cases, it results in complete success.

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