Research Article

Use of Buccal Fat Pad Flap: A Good Reconstructive Option for Oral Mucosal Defects

Malik Ali Hassan Sajid[1], Uzair Bin Akhter[2], Shoaib Younus[3], Riaz Ahmed Warraich[4]

[1]Associate Professor, Department of Oral and Maxillofacial Surgery, FMH College of Medicine & Dentistry, Lahore; [2]Associate Professor, Department of Oral and Maxillofacial Surgery, Sharif Medical & Dental College, Lahore; [3]Associate Professor, Department of Oral and Maxillofacial Surgery, Institute of Dentistry, CMH Lahore Medical College, National University of Medical Sciences, Lahore-Pakistan; [4]Professor of Oral and Maxillofacial Surgery, Institute of Dentistry, CMH Lahore Medical College, National University of Medical Sciences, Lahore-Pakistan.

Abstract

Background: Various congenital and acquired defects affect the different sites of oral cavity. There are multitude of reconstructive options available for oral cavity defects, but for smaller oral mucosal defects many local flaps does not suite due to peculiar & difficult intraoral sites while regional and free flaps become too sophisticated and difficult to harvest. For such instances, buccal fat pad flap could be a good reconstructive option for small mucosal defects of the oral cavity.

Objective: To evaluate the outcome of buccal pad of flap for reconstruction of oral mucosal defects.

Methods: In this case series, Buccal Fat Pad (BFP) was utilized in 33 patients with different indications of oral mucosal defects. All defects were not more than 5x3cm. After application of flap, patients were evaluated for infection, wound dehiscence, loss of flap whether partial or complete, recurrence and epithelization. Data was entered and analyzed using SPSS 22, INC, Chicago USA.

Results: Epithelization was complete in 29 patients (87.8%) 6 weeks postoperatively. Partial flap loss was seen in 2 patients (6.06%). Complete flap loss was also noted in 2 patients (6.06%). Infection occurred in 4 patients who had large maxillary defects on 3rd post op day. Wound dehiscence occurred in one (3.03%) patient only which was left for secondary healing. None of the patients developed trismus (limited mouth opening), esthetic problem, facial paralysis or parotid duct stenosis.

Conclusion: The Buccal Fat Pad (BFP) flap is a simplistic and reliable local flap for the reconstruction of various intraoral mucosal defects due to its rich blood supply, minimal dissection, ease of harvesting and close proximity to the oral cavity defect.

Corresponding Author | Dr. Malik Ali Hassan Sajid, Associate Professor, Department of Oral and Maxillofacial Surgery, FMH College of Medicine & Dentistry, Lahore. **Email:** draliz14@yahoo.com

Key Words: Buccal fat pad (BFP), Oral mucosal defect, Oroantral Communication (OAC), Oroantral fistula (OAF), Oral Submucous fibrosis (OSMF).

Introduction

Various congenital and acquired conditions (leukoplakia, oral sub mucous fibrosis, periodontal infection, trauma and surgical excision) lead to intraoral mucosal defects. Many a times it is associated with bony defect leading to oroantral fistula. This causes difficulty in feeding with food impaction, recurrent sinus infection and speech problems.[1] Reconstruction of primary as well as recu-

rrent oroantral defect is necessary and can be performed with local flaps including; buccal advancement flap, palatal rotation flap, nasolabial flap, temporalis muscle flap or tongue flap. Using local flaps may have disadvantages like decrease in vestibular depth, leaving large denuded areas and they cannot be used to close larger defects.[2] While regional and free flaps become too sophisticated and difficult to harvest having limited approaches for their invasiveness.[3]

In recent past buccal pad of fat flap has achieved great popularity among surgeons for closure of primary and secondary oral soft tissue and bony maxillary defects caused by oroantral communication or fistula, removal of small cysts and tumors, leukoplakia and/or oral submucous fibrosis (OSMF). Since it was first described in 1802 by Bichat, its use for reconstructive purposes has been reported around 1977. Since then, various reconstructive applications of buccal pad fat flap are described in the literature.[4]

Anatomically it is an encapsulated and lobulated mass which consists of a central body having four extensions (Buccal, Pterygoid, Temporal, and Pterygopalatine). Body of flap extends over masseter muscle and positioned over stensen's duct of the parotid, traveling posteriorly through pterygoplalatine fissure. Buccal part rests on periosteum of maxilla overlying the upper most fibers of buccinators muscle.[5,6] It gets its robust blood supply from various blood vessels including buccal, deep temporal branches of maxillary artery, transverse facial artery and facial artery branches. Its average weight is 9.3 grams with a volume of 9.6ml and can provide a pedicled graft of up to 6x5x3 centimeters.[7,8] Therefore buccal pad fat seems to be a simplistic, straightforward and favorable reconstructive option for treatment of intraoral mucosal defects having excellent vascularity, requiring minimal dissection and ease of harvesting.[9-11]

This study was carried out with an objective to evaluate the outcome of buccal pad of fat for reconstruction of oral mucosal defects as scarce data is available locally, this may contribute towards this particular aspect of the reconstruction for intraoral mucosal defects and in turn may also contribute in choosing better options for such defects.

Methods

This case series study was undertaken from June 2014 to June 2015 at Oral and Maxillofacial Surgery Department of Mayo Hospital Lahore and from June 2016 to June 2017 at Oral and Maxillofacial Surgery Department of Fatima Memorial Hospital-College of Medicine & Dentistry Lahore; patients were admitted from OPD of these institutions. Ratio of male-to-female was 1.6:1 (Fig I). The age range was from 16-58 years (mean age=26+/- 8.31 years). The indications for use of buccal pad of fat flap are shown in table 1.

The approval of the study was obtained from Institutional Review Board (IRB) and patients meeting the inclusion criteria were selected. Informed consent of the patients was taken as per Helsinki's declaration.

Patients included were having oroantral communication or oroantral fistula; mucosal defects after excision of oral submucous fibrosis and Leukoplakia; bony defects after enucleating cystic lesions (dentigerous/ keratocyst); and removal of tumors (pleomorphic/ oral squamous cell carcinoma) (Table 1). All defects included with maximum of 5cm x 3cm size (mean= 4 x 2 cm +/- SD= 10mm). All patients with recurrent bony and soft tissue defects treated previously with buccal fat pad flap were excluded from the study. Of 33 patients, 18(secondary cases) were treated with Local Anesthesia (LA: 1.8 ml cartridge of 2% lignocaine with epinephrine in a ratio of 1: 100000); and 15 (primary cases) were treated under General Anesthesia (GA).

Harvesting of buccal fad pad flap was performed as described by Stajcie.[4] It was approached via small horizontally placed incision of 1-1.5cm with bard parker knife # 15 through periosteum. After buccal mucosal flap was reflected, a curved hemostat was introduced bit superiorly through periosteal incision

in third molar region and then submucosal tunnel was created to retreat buccal fat pad in the mouth. Blunt dissection was carried out, suction was done & flap was mobilized. The surgical defect was obliterated by using the flap which followed by suturing it with surrounding mucosa without tension with a resorbable (Vicryl) 3/0 suture. The buccal mucosal flap was also closed without any tension with same resorbable (Vicryl) 3/0 suture. This flap was used as replacement of oral layer over the nasal layer made by turndown flaps in full thickness defects and as single layer for mucosal defects only. All patients were administered with post-operative antibiotics and advised to use softer diet for a week.

The criteria for complete healing of buccal fat pad was achieved if there was complete healing and no sign and symptoms of flap dehiscence, infection, partial or complete loss; while flap epithelization was also assessed on follow-up visits (15 days, 1 month, 3 months & 6 months) as part of successful healing.

Donor site morbidity was assessed postoperatively as trismus (limited mouth opening), speaking or chewing problem, esthetic problem, facial paralysis, parotid duct stenosis or recurrence at 6 months.

SPSS 22. Inc, Chicago, USA was used to process and analyze the data. The results were summarized and quantitative data like age was presented as mean & standard deviation. Qualitative data like epithelization with complete healing, partial loss and complete flap loss & recurrence were presented as frequencies and percentages.

Results

Epithelization and complete healing of buccal fat pad was observed 6 weeks post-operatively in 29 patients (87.8%; mean time of healing 5.1 weeks + /- SD= 8 Days) and *p*-value < 0.0001 (Table 3). However, partial flap loss was noted in 2 patients (6.06%) and *p*-value=0.1605 Complete flap loss was also seen in 2 patients (6.06%), and *p*-value = 0.1605. Infection occurred in 4 (12.12%) patients having maxillary defects on 3rd postoperative day which resolved with local measures and antibiotic coverage. Wound dehiscence occurred in one patient only which was left for secondary healing. None of the patients developed trismus (limited mouth opening), speaking or chewing problem, esthetic problem, facial paralysis, parotid duct stenosis or recurrence when assessed at 6 months postoperatively (Table 2).

Table 1: *Indications of Buccal Fat Pad flap*

Defects	N= number of patients	Percentage (%)
• Oroantral communication/ Fistula(OAC/OAF)	18	54.6%
• Tumor Excision		
1. Pleomorphic adenoma (Right posterior Palate)	3	9.1%
2. Oral squamous cell carcinoma (Right Posterior cheek & Left Retromolar area)	4	12.1%
• Leukoplakia	4	12.1%
• Oral submucous fibrosis(OSF)	2	6.1%
• Maxillary Cystic Defect	2	6.1%
Total	33	100%

Table 2: *Assessment of Outcome of Buccal Fat Pad Flap (N=33)*

Follow -Up	(n= number of patients)	%	Mean + SD	*p*-value
Epithelization with complete healing	29	87.7%	2.66 ± 1.004	**< 0.0001**
Partial loss	2	6.06%	0.18 ± 0.734	0.1605
Complete loss	2	6.06%	0.18 + 0.734	0.1605
Recurrence	Nil	0%	-	-
Trismus	Nil	0%	-	-

Table 3: *Healing of Buccal Fat Pad flap*

Healing week	(N= number of patients)	%
6	29	87.7%
5	2	6.06%
7	2	6.06%
Total	33	100%

Discussion:

Chaudhary et al. reported buccal pad of fat flap as one of reliable and popular method for closure of small to medium sized intraoral maxillary defects for mucosal defects of oral cavity. In the current study, we also opted for use of buccal pad of fat flap due to its rich blood supply and close proximity to oral mucosal defects.[8]

According to Mannelli[12] and Siddarth[13], most common indications noted for the use of buccal fat pad included recurrent oroantral fistula, which is well correlating with the current study. Patients with oroantral communication or fistula were treated with application of buccal fat pad flap. Even recurrent oroantral fistula (OAF) previously treated with buccal advancement flap was also treated secondarily with buccal fat pad which shows successful outcome.

Many authors like Denes[14] and his colleagues supported the same technique to expose, mobilize and suture buccal fat pad without tension using resorbable suture material as described in the current study.

In current study, the epithelization of buccal fat pad was complete after six (6) weeks post operatively (p-value < 0.0001) which seems to be well in line with the results of the study carried out by Sagayaraj[15] and Castellani[16] in which they achieved successful epithelization of buccal fat pad flap in 4-6 weeks without loss/necrosis.

Our experience showed that the buccal fat pad was successful flap in most of cases (87.7%) without any donor site morbidity (p-value =0.1605) and it correlates well with the results of other studies. [17, 18]

The size limitation for this flap was discussed wisely in the study of Rapidis.[19] They reported that maxillary defects which were more than 7x5 cm leads to wound dehiscence/ flap necrosis or loss of flap as the blood supply is compromised. Although the observation in the current study for the partial/ complete loss of flap and recurrence of defect after being closed with buccal fat pad could be explained in the light of above-mentioned study. The success rate of buccal pad of fat for reconstruction of oral mucosal defects is quite encouraging and higher in previous studies.[20-23]

The technique is so simple that it can also be performed under local anesthesia.[24] The current study also included outdoor as well as admitted patients treated either under local or general anesthesia.

The current study has limitation of a sample size which was not very large and it also did not include the pediatric population. Future studies may be

undertaken with larger sample size and focusing over more diverse use of buccal pad of fat.

Case series are especially vulnerable to selection bias which is a limitation of the current study. Surgical procedure done under LA and GA has been included which gives the surgeon same kind of circumstances and liberty per operatively with subtle differences which is another limitation of this study.

Conclusion:

The buccal fat pad flap (BFP) is a simplistic and reliable local flap for the reconstruction of various intraoral mucosal defects due to its rich blood supply, minimal dissection, ease of harvesting and close proximity to the oral cavity defect.

Ethical Approval: Given
Conflict of Interest: The authors declare no conflict of interest
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