

BUCCAL FAT PAD IN RECONSTRUCTION OF ORAL DEFECTS

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ABSTRACT

An ablative surgical procedure in the oral cavity is curative for oral and maxillofacial pathologies, but simultaneously produces hard and soft tissue defects. These defects produce functional and psychological problems in the post operative period.

The Objective of the present study was to evaluate the efficacy of buccal fat pad in reconstruction of intra-oral defects, elaborate the surgical technique used and also identify its post operative complications

A prospective study was conducted on patients with oral defects covered by Buccal fat pad between July 2008 and January 2016 in department of oral and maxillofacial surgery of Khyber College of Dentistry Peshawar. The variables of the study were, Age, gender, cause of surgery and location of intraoral defect. Patients were subsequently evaluated for signs of epithelialisation and Post operative complications.

A total of 50 patients (33 males and 17 females) were recruited in the study. Male to female ratio of patients was 1.94: 1. and Mean age of 51.25 years SD + 12.94. The most common cause of intraoral defect was because of excisions of malignant tumors of oral mucosa and salivary glands. Maxilla was the most common site for the surgical defects observed. The epithelialisation process was completed in 3 weeks without any complications in 44 patients. However dehiscence of the graft was seen in 6 patients, yielding success rate of 88%. We also noted limited mouth opening in cases of retro molar area defects, but this problem was resolved with post operative physiotherapy.

It was concluded that buccal fat pad is a convenient, feasible and quick method of reconstruction for sealing intraoral defects.

Key Words: *Buccal fat pad, Bichat's fat pad, oral defects, oral defects reconstruction, maxillectomy defects.*

INTRODUCTION

The defects in the oral cavity have a profound effect on esthetics, functional and psychological well being of the patient. Surgical management of Traumatic Injury, oral pathology or congenital malformations may result in creation of unwanted defects in the oral cavity. Therefore, goal of treatment is not only eradication of the disease but also the management of surgically created intraoral defects. Various techniques have been suggested for the closure e-g buccal mucosal graft, split

thickness graft, allogenic graft, tongue flaps, fibromucosal plate flaps (the push back technique), facial artery musculo-mucosal flaps (FAMM Flap), temporal muscle flaps and buccal fat pad flap.^{1,2}

Bichat first described the buccal fat pad as an anatomical element in 1802 and Scammon was the first to describe its anatomy. A pedicled buccal fat pad for oral reconstruction was described by Egeydi in 1977.^{3,4} Since then; it has become a useful procedure in reconstructive surgery of various oro-mucosal defects in diverse methods. Reported advantages include easy availability of the flap, large blood supply (facial artery, maxillary artery and superficial temporal artery) that the recipient bed receives, ease of mobility, minimum donor site morbidity, procedure simplicity, low complication rates and less time consuming, compared to other flap reconstruction procedures.^{5,6} When precisely dissected and mobilized, the pedicled buccal fat pad can be used in reconstruction of defects up to 10 x5.5x1.1 cm in size.⁷

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The purpose of this study was to share our clinical experience about the utility of the pedicle buccal fat pad in sealing of oral defects. It also describes the surgical technique used and reports the post operative problems observed.

METHODOLOGY

A prospective observational study was conducted in the Department of Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar from July 2008 till January 2016. The Objective of the present study was to evaluate the utility of buccal fat pad (BFP) in reconstruction of intra-oral defects, elaborate the surgical technique used and also identify its post operative complications. For this purpose a detailed proforma was designed regarding variables of the study i.e., age of the patient, Reasons ablative surgery, location of the defect (cheek mucosa, maxillary tuberosity, palate and retromolar region). In case of oroantral fistula the underlying cause of communication was assessed (surgical extraction or fire arm injury).

All surgical procedures were performed under general anesthesia after taking Informed consent from patients. To gain access to the buccal fat pad, it was either approached through the resection field or a 2cm incision was made in the buccal vestibule near the 2nd maxillary molar tooth. Blunt dissection was performed with caution through the buccinator muscle. After the exposure, suction was strictly avoided to prevent the aspiration of fat. The necessary amount of buccal fat pad was then gently grasped using a none-toothed/de Bakey's forceps, mobilized, brought and spread over the defect. The fat pad was then sutured to the defect margins by simple, interrupted sutures with resorbable 3/0 vicryl. The fat was left uncovered. In a few cases there was incidental popping out of buccal fat pad during surgery, which was then used to its advantage in covering the defect. Great care was exercised to take care of anatomical structures in the region like buccal branch of the facial nerve and the parotid duct.

Oral rinsing of buccal fat pad was prohibited for 2 weeks. All the patients were put on Nasogastric (NG tube) feeding for 2 weeks as well. Antibiotics and analgesics were prescribed to be taken 3 times daily for 7 days. Patients were instructed to avoid brushing and trauma to the surgical site. Resorbable Sutures were used in all cases so a second procedure i.e., suture removal was not required. Patients were assessed postoperatively twice a day till discharged from the hospital. Follow up visits were scheduled weekly for 3 weeks and then once a month for one year. Patient who were operated for various maxillofacial tumors were kept on longer follow up. In every visit, status of the defect, Complete healing of the wound and presenting complaints and complications were addressed. Patient satisfaction was

also assessed with special regard to their phonetics, chewing and esthetics The SPSS version 20.0 was used to analyze the data using descriptive statistics. Data were presented in the form of tables and graphs/charts.

RESULTS

A total of 50 patients were recruited in this study. Amongst them 33 were males and 17 females with male to female ratio of 1:1.94. (Fig 1). The age of patients ranged from 21 to 80 years (Mean 51.25 years SD ±12.94). (Table 1)

TABLE 1: AGE GROUPS OF PATIENTS WITH FAT PAD RECONSTRUCTION

Age groups in years	No. of patients	Percentage
21 to 30	3	6%
31 to 40	7	14%
41 to 50	11	22%
51 to 60	19	38%
61 to 70	6	12%
71 to 80	4	8%
Total	50	100%

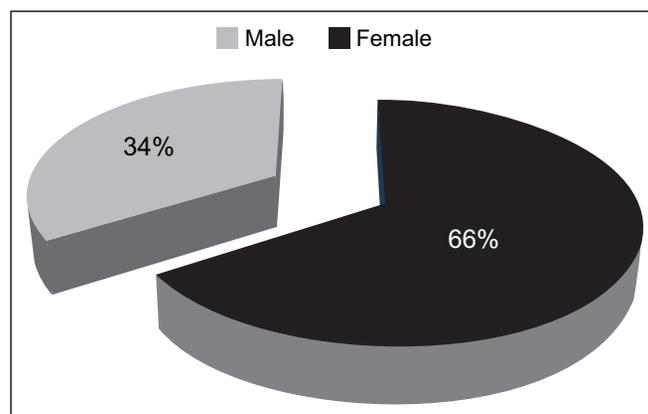


Fig 1: Gender distribution

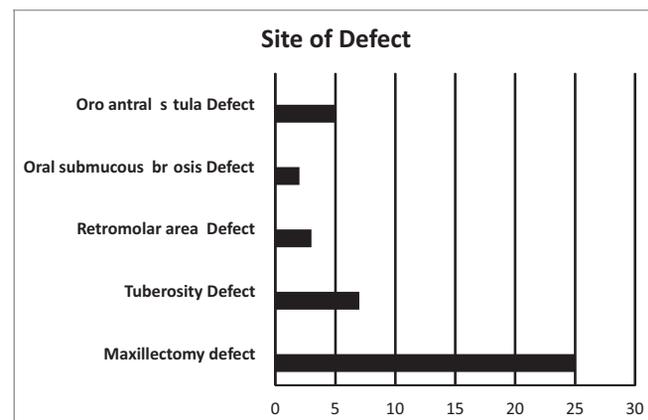


Fig 2: Site of defect

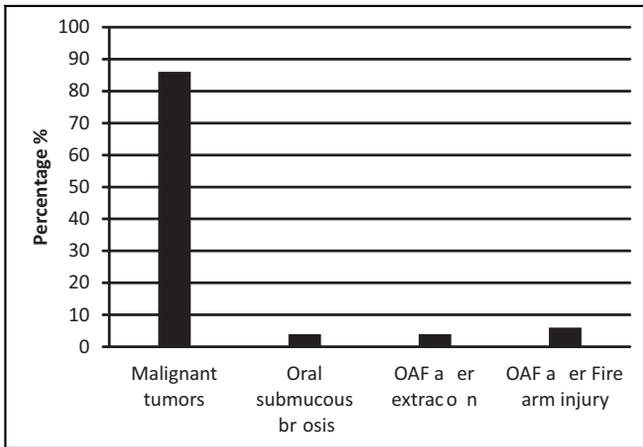


Fig 3: Causes of defects



Fig 4: Buccal Fat Pad Advancement flap in a partial maxillectomy defect



Fig 5: Complete epithelialization of the Buccal fat pad

Partial maxillectomy defects 25 were the most common defects reconstructed with BFP flap followed by cheek mucosal defects i.e., 8 patients, 7 patients were treated for maxillary tuberosity defects, 3 for retromolar area defects, 2 for oral submucous fibrosis and 5 for oroantral fistula. (Fig 3). The partial maxillectomy, cheek mucosa, maxillary tuberosity and retromolar area defects were because of resection of malignant tumors of oral mucosa and minor salivary glands. These included squamous cell carcinoma, Adenocarcinoma, Adenoid cystic carcinoma, Mucoepidermoid carcinoma and malignant melanoma. In case of oro-antral fistula, the causes were dental extractions in 2 cases and fire arm injury in 3 of the cases. (Fig 2, 3)

In all patients the defect was adequately repaired. Double layered closure technique was used in one case of oroantral fistula. In cases of uneventful immediate post operative period, signs of epithelialization were seen to be started by the end of 1st week (Fig 4). Complete epithelialization was noted by the end of 4 weeks (Fig 5).

The immediate post operative complications were pain and edema. Limitation in mouth opening occurred in 3 patients, all of which were treated for retro-molar area defects. On follow up visits, Dehiscence in 6 patients was noted on their follow up visits. None of the patient had any esthetic disturbances. All oral defects (except 6) were successfully resolved with Bichat’s fat pad technique, yielding a success rate of 88%.

DISCUSSION

Defects in intraoral region are inevitable when surgical resection of large, invasive tumors is performed. They can be due to firearm injury, oro-antral communications or release of fibrous bands of oral submucous fibrosis. These defects can be obturated with prosthesis or local flaps such as buccal advancement flap, palatal rotational flap or combined buccal and palatal double layered closure flaps. These options may be advantageous in various ways but they have certain limitations as well e-g production of denuded bone, vestibular sulcus obliteration and inability to close larger gaps. Similarly use of distant flaps is undesirable due to the invasive nature of procedure.²⁻⁷ In the past 3 decades, the use of buccal fat pad has gained popularity in the reconstruction of intraoral defects due to its obvious advantages.⁸

Tideman et al described the anatomical characteristics, blood supply, surgical technique in the clinical results of 12 cases of reconstructions of surgical defects in the oral cavity.⁹ Buccal fat pad is an easily accessible tissue with reasonable mobility and adequate blood supply from facial artery, maxillary artery and superficial temporal artery. The procedure is simple, less time

consuming involving minimum donor site mobility as compared to distant flap reconstruction procedures. It does not interfere with intraoral prosthesis, speech or deglutition. When properly dissected and mobilized, the buccal fat pad can provide 7x4x3 cm graft.¹⁰ In this case series, buccal fat pad was used to reconstruct partial maxillectomy defects, oroantral fistula, defects of cheek mucosa, maxillary tuberosity and retromolar area.

Hao has mentioned the maxillary defect to be ideal for reconstruction with buccal fat pad owing to its closer proximity to the region. The closer anatomy, therefore minimizes the risk of post operative infections as well.¹¹ In our study, 25 partial maxillectomy defects and 7 maxillary tuberosity defects were covered. In all these patients, the cause of defect was ablative surgical procedure for malignancies. These malignant lesions were identified as squamous cell carcinoma, Adenoid cystic carcinoma, mucoepidermoid carcinoma and malignant melanoma. Surgical excision of the lesion along with reconstruction of defect with buccal fat pad was planned. The closer anatomical proximity made buccal fat pad a convenient option for us to cover these defects, with minimum postoperative morbidity.

Although maxillary defects are ideal due to their location, the buccal fat pad can also be applied to defects in anatomical sites like retromolar trigone and palate.^{2,6} Our clinical observation in 3 cases of retromolar area showed BFP could be used with a high success rate. However limited mouth opening was the immediate post operative complains in all of them. Postoperative physiotherapy was advised to all of them once the epithelization was completed.

Oroantral communications described in the literature were secondary to extractions, excisions of cysts and tumors, sinus lifts ,periimplants.^{2,6} Methods of closure include buccal flap advancement, palatal flap advancement , Combined buccal and palatal technique, distant flaps, bone grafts and alloplastic materials. Stajcic reported straight advancement flap as an ideal technique in communications secondary to tooth extractions.¹⁰ However he also recommended use of buccal fat pad in cases where vestibular or palatine alveolar periosteum is very damaged. De Moraes¹² also reported a case in which buccal fat pad was utilized to seal an oroantral fistula in the same surgical step used for zygomatic implant technique. The results of these authors coincide with the data obtained in our series of 5 cases of oroantral fistula repaired using buccal fat pad. All our cases yielded satisfactory results without any presentation of altered vestibular depth or denuded bone as seen in case of buccal and palatal advancement flaps used in closure of oroantral fistula.

Many authors report that the buccal fat pad exposed within the oral cavity undergo epithelization within 2-3

weeks. Therefore total covering of the flap with a skin graft is not necessary to ensure treatment success.¹⁻⁶ In the present study, the epithelization was seen in 3 weeks in both the oral and sinusal zones. However it is important to ensure correct incision, careful handling of the flap, knowledge of its size limitations, complete coverage of the surgical defect, suturing without tension and strict postoperative instructions to patients; for uneventful epithelization and minimum post operative complications. A cover plate for the flap or nasogastric tube feeding is recommended for first few days.¹⁵ All the patients were put on Nasogastric tube feeding for the 1st 2 weeks.

The literature reports intra and post operative complications related to the oral defects closure using buccal fat pad. Rapidis et al stated that in maxillary defects more than 4x4x3cm, the probability of partial dehiscence of the flap is high because of the impaired vascularity of the stretched ends of the flap.¹³ This coincides with observation in our series where we had dehiscence in 6 cases of maxillectomy defects due to the larger size of area covered. Other commonly reported complications include intraoperative bleeding, hematoma, infection, foul smell partial necrosis, facial nerve injury and excessive scarring.^{14,15,16,17} Fortunately none of these complications were observed in our cases. However, limited mouth opening was observed in cases where defects of retromolar trigone were repaired.

Buccal fat pad can also be successfully used to close anterior maxillary defects in infants because in infants and in children buccal fat pad is abundant and smaller dimension of anteroposterior maxilla.¹⁸ Use of buccal fat pad as an interpositioning substance after gap arthroplasty of temporomandibular joint is also advocated in literature.^{19,20}

CONCLUSION

BFP flap in repairing oral defects is an excellent, quick, both patient and operator friendly way to achieve the desired outcome. The only disadvantage is that it can only be used for once. However; proper planning, strict adherence to surgical principles, careful dissection and postoperative care results in complete success. Patients with cheek defects resulted because of fibrous band excisions for oral submucous fibrosis and post radiotherapy cases needs special attention as the size of the fat pad is variable in these cases. Advanced imaging techniques like CT and MRI Scans preoperatively for evaluation of size of buccal fat pad is required for successful reconstruction of larger defects.

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CONTRIBUTION BY AUTHORS

- 1 Muslim Khan:** Execution and generation of Idea for the study. Principal Author and operator of the cases.
- 2 Nigam Sattar:** Helped in Literature search, Reference citation, and Statistical work, helped in discussion writing
- 3 Tariq Ahmad:** Helped in Methodology writing, Tables and Diagrams and relevant statistical work