

CASE REPORT

Buccal Pad of Fat As A Scaffold In Healing of Intraoral Defects - A Review of Two Cases

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ABSTRACT

Introduction: The following case report aims to highlight the excellent properties of buccal pad of fat as a scaffold and autogenous dressing in healing of intraoral defects after excision of benign/pre-malignant/malignant lesions of the oral cavity. The buccal pad of fat presents an easy, safe and dependable means of reconstruction of intraoral defects following wide excision of benign/premalignant/malignant lesions.

Case report: A report of 2 cases both males respectively in their 5th & 4th decades of life diagnosed as dysplasia & verrucous carcinoma of buccal mucosa undergoing wide excision & primary reconstruction with autogenous buccal fat of pad is presented.

Conclusion: Buccal pad of fat has been traditionally viewed as a conventional dressing material in maxillofacial & plastic surgery. Through this case report, we attempt to qualify it as an excellent intraoral dressing as well as scaffold dressing in healing of intraoral defects such as following the excision of verrucous carcinoma & dysplastic lesions.

Key words: Buccal Pad, Fat, Intraoral lesion

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INTRODUCTION

The Buccal Pad Of Fat (BFP), which is often referred to as "la boule de Bichat"(after Bichat, 1802),¹ is a specialized fatty tissue. Anatomically, the buccal pad of fat is located between the buccinator muscle and the mandibular ramus, separating the masticatory muscles from each other, from the zygomatic arch, and from the ramus of the mandible. It is distinct from subcutaneous fat in that it is an encapsulated (fascial capsule), richly pedicled and therefore a highly vascular variety amongst the constitutional adipose. For many years BFP was usually considered a surgical nuisance because of its accidental encounter either during various operations in the pterygomaxillary space or after injuries of the maxillofacial region. It comprises of 4 anatomic extensions namely the buccal, maxillary, temporal, pterygoid and a main body overlying the anterior border of masseter muscle. It is surrounded by a facial envelope and, in the infant, is said to prevent indrawing of the cheeks during suckling.² The use of the buccal fat pad in the closure of palatal defects has gained popularity only in the recent years after the works of Egyedi,³ Neder,⁴ Tideman et al.⁵ The anatomy, vasculature, and innervation of the BFP, as well as its clinical applications in reconstruction of orofacial defects have been extensively studied. Particularly observed were the anatomic findings that BFPs in cadavers were unrelated to the general adiposity and that even in cachectic specimens the BFPs were normal in weight and volume.^{6,7} The average weight of each fat pad was found to be 9.3 g, and its average volume was 9.6 ml. They stated that

the BFP serves to line the masticatory space, separating the masticatory muscles from each other and from the mandibular ramus and the zygoma. This volume could in practice be accommodative to repair a defect measuring 4 x 4 x 3 cm in Maxilla & 7 x 5 x 2 cm. in mandible. It is a relatively technique sensitive procedure as the BFP chiefly owes its blood supply primarily to the small venules and arterioles situated in the base, therefore both excessive manipulation at the base and the rupture of surrounding vascular capsule results in free fat transfer rather than vascular grafting.

CASE REPORT

CASE 1: A 47 year old male reported to the department of oral & maxillofacial surgery with the chief complaint of pain and burning on consumption of hot, spicy foodstuffs with a history of bidi smoking (8-10 per day) since past 20 years. Clinical Examination revealed a reddish grey lesion overlying the region of 46,47,48 (extracted 1 year previously for the being grossly decayed) extending upto the buccal mucosa overlying 26,27,28 region superiorly, upto 46 region anteriorly and 2 cm anterior to the faucial pillars posteriorly (Fig. 1). A previously performed incisional biopsy had reported the lesion to be histopathologically “dysplasia” and a wide excision with 1 cm margins and reconstruction using buccal pad of fat was planned. An incision was made along the predetermined lines upto submucosa and a plane of dissection developed therein. The adequate margins were maintained and excision completed. A 1.5 cm long linear incision was then made at in the buccinator underlying the buccal mucosa opposite 26,27,36,37 region and the buccal pad of fat was teased out with its capsule (Fig 2) from this access using a curved artery forceps. The BFP was pulled anteroinferiorly in its entirety taking care to preserve the capsule and sutured to the margins of the defect using 3- 0 round body vicryl (Fig 3). Patient was followed upto 3 months postoperatively and uneventful healing was seen (Fig 4).

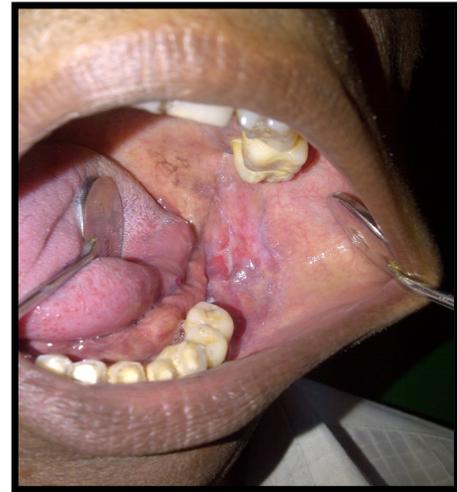


Figure-1: Reddish Grey patch overlying the 26,27,28 and 46,47,48 region

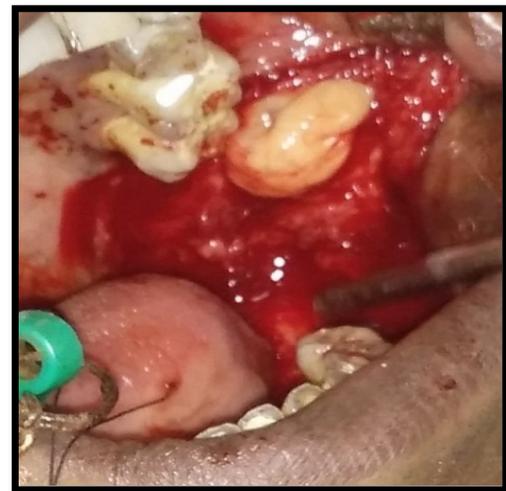


Figure-2: Buccal pad of fat being teased out along with its capsule.

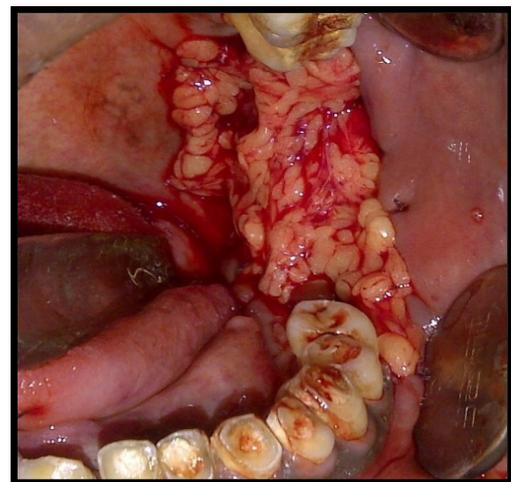


Figure-3: Buccal pad of fat being sutured to the defect margins using 3-0 round body vicryl.



Figure - 4: Post-op healing & successful uptake evident after 3 months.



Figure-5: Exophytic growth opposite 27,28 & 37,38 region

CASE 2: A 35 year old male patient reported to the department of oral & maxillofacial surgery with a chief complaint of pain, swelling and difficulty chewing in relation to the left cheek region opposite upper & lower back teeth since 3 months. As reported by the patient, the lesion was noticed 3 months previously and was increasing in its size gradually thereafter. Clinical examination revealed a 2cm x 2.5cm exophytic, corrugated, solitary growth overlying the buccal vestibule opposite 27,28,37,38 region (Fig 5).

An incisional biopsy was performed and the lesion was reported as verrucous carcinoma. A wide excision with 1.5 cm margin and reconstruction using buccal pad of fat was planned. A submucosal plane of dissection was developed as described previously following an incision extending upto submucosa and the fat of pad was teased (Fig 6). The capsule was preserved and the defect was covered and the autograft sutured to the periphery using 3-0 round body vicryl (Fig 7). Patient was followed for 1 year and uneventful recovery and remission was seen.

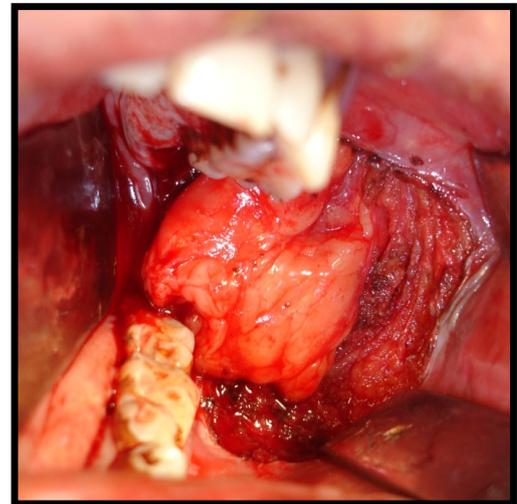


Figure-6: Buccal pad of fat being teased out along with its capsule after submucosal excision



Figure-7: Buccal pad of fat sutured to the defect margins using 3-0 round body vicryl

DISCUSSION

The anatomy of the BFP is complex. Few detailed descriptions can be found in the anatomic literature,^{8,9} and only brief reference is made to the BFP in textbooks. A detailed review of the surgical anatomy can be found in Tideman

et al.,⁵ and, more recently, further descriptions of its anatomy were published by Stuzin et al.⁶ and Dubin et al.⁷ Briefly, the BFP has a central body with four extensions. The main body lies above the parotid duct on the anterior border of the masseter muscle and extends deeply to lie on the posterior maxilla and forward along the buccal vestibule. The buccal extension is the most superficial and enters the cheek below the parotid duct. It descends to the mandibular retromolar region and overlies the main part of the buccinator muscle. The pterygoid extension passes down and back to lie on the lateral surfaces of the pterygoid plates. The temporal extension passes upwards below the zygomatic arch, and comprises a deep and a superficial portion. The deep part lies directly on the temporalis muscle and its tendon, separating the muscle from the zygomatic arch. The blood supply of the BFP is from three sources: the maxillary artery (buccal and deep temporal branches), the superficial temporal artery (transverse facial branch), and the facial artery (small branches). Once the fascial envelope of the BFP is opened, spontaneous fat pad herniation into the mouth occurs. This is why, traditionally, the BFP is considered to be a nuisance when accidentally encountered during intraoral surgery such as orthognathic or trauma surgery. Because of the ease of access and rich blood supply, the use of the BFP as a pedicled graft is an attractive concept. The blood supply of the BFP is from three sources: the maxillary artery (buccal and deep temporal branches), the superficial temporal artery (transverse facial branch), and the facial artery (small branches).² Egyedi³ was the first to report the use of the buccal fat pad as a pedicled graft for the closure of oro-antral and oronasal communications: a split-thickness skin graft was used to line the oral side of the fat pad. Neder⁴ reported the use of the buccal fat pad as a free graft for reconstruction of defects within the oral cavity. Tideman et al.⁵ have shown that the buccal fat pad need not be covered by a skin graft when brought into the mouth because it epithelializes readily within 2 to 3 weeks. The healing of buccal pad of fat has been extensively studied at the histological level and the gathered body of evidence is supportive of the fact that the transferred BFP starts to epithelialize in a week

and completes its epithelialization within 6 weeks. At that time, the graft is covered with healthy-looking oral mucosa. It seems that the superficial layer of fat tissue is replaced by granulation tissue and is finally covered by stratified squamous epithelium migrating from the regions neighboring the margins of the flap.¹⁰ Samman et al.² examined histologically samples from healed reconstructions and found that the surface of the healed graft was formed by parakeratotic stratified squamous epithelium with flattened rete ridges. The subepithelial stroma consisted of sparsely cellular, dense fibrous connective tissue, and there was no lamina propria or submucosa. No fat cells could be identified when paraffin-embedded sections were stained with osmium tetroxide. These findings support the view that the surface of the fat is replaced by fibrous tissue at least to the depth of a 6 to 8 mm biopsy specimen. The surgical technique involved in the exposure of the buccal pad of fat is a matter of consensus amongst various authors.^{5,8,10} The reports of the buccal pad of fat as a scaffold in healing of osseous defects were published as early as in 1988 when, Vuillemin et al.¹¹ used the BFP as a pedicled flap to cover osseous grafts from the ribs and the iliac crest in 8 cases of immediate reconstruction of maxillary surgical defects. The flap was placed on the medial aspect of the bone graft, serving as an additional recipient bed and as a means of isolating the graft from the antrum. The outer aspect of the graft was covered by the palatal and buccal mucosa. Marx¹² questioned this method because of the high incidence of complications and its limited use for only cases of benign osseous tumors and cystic lesions, the extripation of which would allow an intact palatal and buccal mucosa along with the periosteum. Ho⁶ reported successful results with the use of the BFP in reconstruction of both palatal and cheek defects. Several recent applications of the buccal pad of fat have caught attention of the scientific community. In 2014, Rotaru H et al.¹² published a report analyzing the successful use of buccal fat pad in healing of defects caused by medicine related osteoradionecrosis of the jaws (MRONJ) in six patients graded as stage II disease (2 cases) and stage IV disease (4 cases), all of which showed satisfactory healing. The maximum size

of defect closed measured 62 x 18 mm. De Biasi M et al. in 2014 assessed the use of buccal pad of fat in successful surgical management of closure of oro-antral communications.¹³ In 2014, Kim YK et al.¹⁴ used pedicled BFP simultaneously with collagen membrane for largely successful repair (9 successful out of 12 implants) of perforated sinus membranes in sinus grafting procedures. Recent body of literature goes to show that our technique can be suitably modified for use in cancer patients with postoperative radiotherapy as the BFP graft does not appear to be compromised by radiation.¹⁵

Therefore, the buccal pad of fat scores over the conventional dressing materials in several aspects such as easy to harvest, rich blood supply (3 perforators), autogenous in origin (less immunogenic/allergenic) hence lower probability of graft rejection, rapid healing (epithelializing in 2-3 weeks time) and multiple applications and therefore holds a promising future in maxillofacial surgery.

CONCLUSION

We conclude that the buccal pad of fat is as an intraoral scaffold is rapidly healing, less invasive, easy to harvest & manipulate and a reconstructive material which is free from significant post-operative complications.

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