Buccal Fat Pad in Intraoral Defect Reconstruction

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Abstract The use of buccal fat pad as a graft for intraoral defects is an uncommonly reported procedure but, it has been frequently used for closure of oro-antral and oro-nasal communications. Buccal fat pad was used to reconstruct 3 medium sized defects due to tumoral resection and oro-antral communication. It was used as an unlined pedicled graft. Three cases are discussed along with anatomical aspect of the buccal fat pad. The findings support the view that the buccal fat pad is versatile, logical, convenient, and reliable method for the reconstruction of oral defects up to 4–5 cm in diameter and it healed within 4–5 weeks.

Keywords Buccal pad fat · Pedicled graft · Intraoral defect · Healing

Introduction

Buccal fat pad in recent years has become a well accepted graft for covering intraoral defects. It is a mass of specialized adipose tissue able to enhance intermuscular motion of cheek, thus termed “syssarcosis” and is important in facial contour. Its appearance is distinct from subcutaneous fat and

resembles orbital fat in both form and function [1, 2]. First mentioned by Heister in 1732 and described in 1801 by famous French anatomist Xavier Bichat and referred to in medical literature as the “boule de Bichat” [1, 3]. Buccal fat pad is a supple and lobulated mass, easily accessible and mobilized, located between the buccinator muscle and the mandibular ramus, separating the masticatory muscles from each other and often considered to be a nuisance when encountered in intra-oral procedures such as facial bone osteotomies, elevation of buccal flap or procedure on Stenson’s duct [4]. Egyedi in 1977 was the first to report on the application of the buccal fat pad as a pedicled graft lined with a split thickness skin graft for closure of oro-antral and oronasal communication [5]. Nader in 1983 described the use of buccal fat pad as a free graft to cover intraoral defects [6]. Tideman et al. reported that buccal fat pad graft is epithelialized within 2–3 weeks thus making the graft easy to apply. In 1988 Vuillemin et al. used the buccal fat pad as pedicled flap to cover osseous grafts from ribs to iliac crest [7]. History reported successful results with use of buccal fat pad in reconstruction of both palatal and cheek defects. Buccal fat pad is mainly used to cover defects in the posterior maxilla, the buccal region, the hard palate, the soft palate, and the retromolar and pterygomandibular regions after tumor resection and oro-antral communication after tooth extraction [4].

Anatomical Considerations

The anatomy of buccal fat pad is complex. Scammon was the first to describe the anatomy, followed by Goughran [7]. A detailed review is based on series of cadaveric dissections done by Stuzin et al. The buccal fat pad is a rounded and biconvex structure, surrounded by a slight

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Fig. 1 Anatomy of buccal pad fat

capsule and located inside both masticatory spaces [2]. Buccal fat pad rests on periosteum that covers the posterior aspect of maxilla and is bounded by buccinator muscle medially, masseter muscle and mandibular ramus medially, and lateral pterygoid muscle superiorly [8]. It consists of a main body and four extensions: buccal, pterygoid, superficial temporal, and deep temporal [9] (Fig. 1). The main body lies on the anterior border of the masseter muscle and extend deeply to lie on 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 buccinator muscle the pterygoid extension passes down and back to lie on the lateral surfaces of pterygoid plexus. The temporal extension passes upwards below the zygomatic arch, and comprises deep and superficial portions. Buccal fat pad has rich plexus of blood vessels from branches of maxillary (buccal and deep temporal branches), superficial temporal (transverse facial) and facial arteries (small branches), which allow it to be used as axial-pattern pedicled flap [3, 5].

Report of Cases

Case Report 1

A 76 year male was referred for alveoloplasty in left posterior maxillary region. Patient gave history of a growth in the left maxillary alveolar region, which was diagnosed as malignancy and for the same had completed 31 cycles of radiotherapy one and half year back. After 6 months patient started getting his mobile teeth and root pieces extracted. Patient also gives a history of prolonged healing

Fig. 2 Oro-antral communication

of the extracted sockets. However, he got a denture constructed, which he wore for the past 1 year. During alveoloplasty he developed an oro-antral communication (Fig. 2), which was closed primarily. The same condition was operated twice later, unsuccessfully, for closure with buccal advancement flap under local anesthesia.

Patient was planned for closure of oro-antral communication with buccal fat pad grafting. The left buccal pad fat was mobilized and with a gentle traction secured to the margins of the defect with polyglactin 910 sutures (Figs. 3, 4). Patient was put on antibiotics, nasal decongestants, and anti-inflammatory drugs. Patient was on regular follow up till 6 months (Fig. 5).

Case Report 2

A 75 year old woman reported with a slow growing, white pebbly, exophytic growth involving the left buccal mucosa

Fig. 3 Harvesting of buccal pad fat

Fig. 6 Clinical appearance

Fig. 4 Buccal pad fat graft in place

Fig. 7 Harvesting of buccal pad fat

Fig. 5 Post-operative 6 months

Fig. 8 Buccal pad fat graft in place

(Fig. 6) extending up to retromolar triangle. Clinical features were suggestive of verrucous carcinoma, confirmed with help of biopsy. Surgical excision of the lesion along with reconstruction with buccal pad fat was planned (Figs. 7, 8). Total healing was evident by 5th week post operatively (Fig. 9).

Case Report 3

A 26 year old male reported with a swelling in the right maxillary posterior region since 3 months. The swelling was initially painless and small in size and was associated

Fig. 9 Post-operative 5 weeks

Fig. 10 Clinical appearance with cortical plate expansion

with pain since 15 days. The lesion presented as a irregular soft swelling associated with molars and tuberosity extending palatally which was covered with whitish slough surrounded by an erythematous halo along with bulging of the cortical plates (Fig. 10). CT Scan revealed a 1.98×1.68 cm mass in the right maxillary sinus extending beyond lateral wall of right maxilla (Fig. 11). Biopsy report revealed the lesion to be a central giant cell granuloma.

A partial maxillectomy was performed and the defect was closed with the help of buccal pad of fat (Fig. 12).

Discussion

The use of buccal pad of fat has increased in popularity in the recent years because of its reliability, ease of harvest, low complication rate, rich blood supply, simple procedure, and minimal discomfort to patient [5, 10]. When properly dissected and mobilized, the buccal pad of fat provides a $7 \times 4 \times 3$ cm pedicled graft [7]. Studies have shown that

Fig. 11 CT scan showing extent of lesion

Fig. 12 Buccal pad fat graft in place

it completely heals within 4–6 week time and is covered by stratified squamous epithelium by fifth week [7, 11]. The average weight of each fat pad is around 9.3 gm and its average volume is 9.6 ml [7]. The size of the buccal pad of fat is fairly constant among different individuals regardless of the overall body weight and fat distribution [2].

It is being used as pedicled graft in facial augmentation procedures, repair of persistent oro-antral fistulae after dental extractions, treatment of oral submucous fibrosis [4, 12] reconstruction of medium sized maxillectomy defects from premolar to tuberosity region, and repair of defects of soft and hard palate [12], cheek mucosa, retromolar trigone [13], tonsillar defects [2]. It can also be used in combination with temporalis flap for larger defects.

Potential complications are minimal [7, 13]. However, hematoma, infection (0.6%), facial nerve injury, partial necrosis (7.9%), and excessive scar formation (5.4%) have

been reported. Post-operative radiotherapy and preoperative chemotherapy did not seem to jeopardize survival of the graft, although these treatments do delay epithelialization [5, 13].

The use of a pedicled buccal pad of fat is a logical, convenient and reliable method for the reconstruction of oral defects up to 4–5 cm in diameter in the ipsilateral side of the soft palate and posterior alveolar region of maxilla [5]. The procedure is technically easy and donor site is in close proximity to the defect. Furthermore it is located in the same surgical field as the defect to cover, therefore diminishing the risk of infection. It can be concluded that buccal pad of fat because of its access and rich blood supply, seems to be one of the safest reconstructive methods for small and medium intraoral defects.

References

1. Marzano UG (2005) Lorenz heister's molar gland. *Plast Reconstr Surg* 115(5):1389–1393
2. Martin-Granizo R, Naval L, Costas A, Goizuta C, Rodriguex F, Monje F, Munoz M, Diaz-F (1997) Use of buccal fat pad to repair intraoral defects: review of 30 cases. *Br J Oral Maxillofac Surg* 35(2):81–84
3. Baumann A, Ewers R (2000) Application of the buccal fat pad in oral reconstruction. *J Oral Maxillofac Surg* 58(4):389–392
4. Yeh CJ (1996) Application of the buccal fat pad to the surgical treatment of oral submucous fibrosis. *Int J Oral Maxillofac Surg* 25(2):130–133
5. Samman N, Cheung LK, Tideman H (1993) The buccal fat pad in oral reconstruction. *Int J Oral Maxillofac Surg* 22(1):2–6
6. Loh FC, Loh HS (1991) Use of the buccal fat pad for correction of intraoral defects: report of cases. *J Oral Maxillofac Surg* 49(4):413–416
7. Rapidis AD, Alexandridis CA, Eleftheriadis E, Angelopoulos AP (2000) The use of the buccal fat pad for reconstruction of oral defects: review of the literature and report of 15 cases. *J Oral Maxillofac Surg* 58(2):158–163
8. Dolanmaz D, Tuz H, Bayraktar S, Metin M, Erdem E, Baykul T (2004) Use of pedicled buccal fat pad in the closure of oro-antral communication: analysis of 75 cases. *Quintessence Int* 35:241–246
9. Dubin B, Jackson IT, Halim A, Triplett WW, Ferreira M (1989) Anatomy of the buccal fat pad and its clinical significance. *Plast Reconstr Surg* 83(2):257–262
10. Hanazawa Y, Itoh K, Mabashi T, Sato K (1995) Closure of oro-antral communications using a pedicled buccal fat pad graft. *J Oral Maxillofac Surg* 53(7):771–775
11. Chao Ck, Chang LC, Liu SY, Wang JJ (2002) Histologic examination of pedicled buccal fat pad graft in oral submucous fibrosis. *J Oral Maxillofac Surg* 60(10):1131–1134
12. Hudson JW, Anderson JG, Russell RM Jr, Anderson N, Chambers K (1995) Use of pedicled fat pad graft as an adjunct in the reconstruction of palatal cleft defects. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 80(1):24–27
13. Awang MN (1998) Closure of oroantral fistula. *Int J Oral Maxillofac Surg* 17(2):110–115