

## The versatility of buccal pad of fat as an adjunct flap in cleft palate repair

Janani Kandamani<sup>1</sup>, Divya Sanjeevi Ramakrishnan<sup>1</sup>, Abdul Wahab P U<sup>2</sup>, Senthil Murugan P<sup>3</sup>

Form <sup>1</sup>Postgraduate, <sup>2</sup>Professor, <sup>3</sup>Associate Professor, Department of Oral and Maxillofacial Surgery, Saveetha Dental College, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

**Correspondence to:** Janani Kandamani, Department of Oral and Maxillofacial Surgery, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, No 162, Poonamallee High Road, Chennai - 600 077, Tamil Nadu, India. E-mail: jananikandamani@gmail.com

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### ABSTRACT

The buccal pad of fat (BFP) has a variety of applications in cleft palate surgery. Early dehiscence and fistula formation in the cleft palate repair are common complications encountered due to closure under tension, poor handling of tissues, and failure to achieve a layered closure. This case series emphasizes the use of a bilateral pedicled BFP graft as a separate layer in wide primary cleft palate repair when the nasal mucosal layer is sutured under tension and also in a case of nasal mucosal tear while suturing to avoid palatal fistulas postoperatively. No recurrence was seen and the donor site healed well without esthetic or significant functional impairment. The post-operative course was uneventful. This series confirms the excellent and predictable healing of BFP intraorally and the minimal morbidity associated with the use of such grafts in cleft palate surgeries.

**Key words:** *Buccal fat pad, Cleft palate, Congenital deformity, Surgery*

Cleft of the lip and/or the palate (CLP) is a congenital birth defect which is characterized by the complete or partial CLP. The severity of the cleft may vary from the trace of the notching of the upper lip to a complete non-fusion of the lip, the primary palate, and the secondary palate. CLP anomaly constitutes nearly one-third of all congenital malformations of the craniofacial region with an average worldwide incidence of 1 in 700. Its incidence in the Asian population is reported to be around 2.0/1000 live births or higher. From various multicentric studies across India, the incidence of CLP in India ranges from around 0.93 to 1.3 for CLP. Based on rough estimates, it is suggested that approximately 35,000 newborn cleft patients are added every year to the Indian population.

Cleft palate, a common congenital deformity caused by incomplete fusion of the two maxillary processes. Successful surgical treatment of cleft palate reinforces sealing the communication between the oral cavity and the nasal cavity [1]. Conventional palatal repair generally involves paring of the margins of the cleft and mobilizing the tissue for approximation in the midline to achieve closure [2].

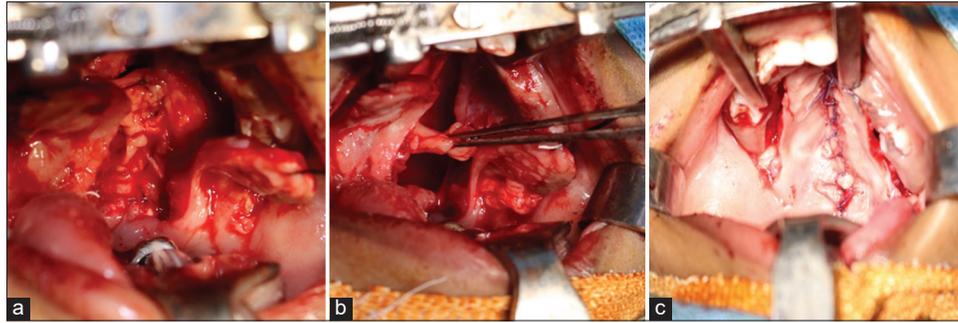
The purpose of this article is to provide the rationale for the use of pedicled buccal fat pad (BFP) grafts, as an adjunct flap in conjunction with pedicled mucosal flaps is outlined in this case report. Two representative cases are presented, in which a pedicled buccal fat graft was adjunctively used in conjunction with pedicled mucosal flaps to avoid post-operative palatal fistulas.

### CASE REPORT

#### Case 1

A 1½-year-old baby boy presented with a chief complaint of a wide complete cleft of the palate. No relevant medical history was noted. The design of the incisions was as for a two-flap palatoplasty. Surgery was carried out with stable vitals and orotracheal intubation was done under general anesthesia. Infiltration 1:200,000 adrenaline was done along the cleft margins and proposed incision lines. Incisions were made from just posterior to the maxillary tuberosities bilaterally, to divide the alveolar mucosa from the palatal mucosa with a size 15 surgical blade. These incisions (lateral incision) were made down to the underlying bone and at 90 to it, to avoid undermining the soft tissues. The incisions extend as far as 1 cm anterior to the anterior limit of the cleft.

A mucoperiosteal flap was raised from the vomer, and the mucoperiosteum on the nasal side of the opposite palatal shelf was widely dissected. The muscles of the soft palate were freed from the posterior edge of the hard palate and the nasal mucoperiosteum. The entire muscle was now repositioned and the muscles reoriented. A transverse releasing incision was made only in the nasal layer at the junction between the hard and soft palate and an elliptical-shaped defect formed. Blunt dissection was done laterally from the site of lateral release and the BFP located. The body and buccal extension of the pad were teased out gently, tunneled beneath the existing palatal mucoperiosteal flap, and below and behind the released greater palatine vessel (Fig. 1).



**Figure 1:** (a) Harvesting buccal fat pad; (b) suturing of buccal pad of fat with nasal mucosa; (c) cleft palate closure (case 1)

Care was taken to tease the pedicle gently to its maximum extent without damaging the capsule or separating globules of the fat pad. The fat pad was pulled into the defect from the other side as well and stabilized in the middle with sutures. Most of the lateral defect also gets filled with the fat pad. With the final closure in the oral layer, one or two sutures were made to incorporate the fat pad in the middle. During the 10-month review, there were no visible signs of wound dehiscence noted (Fig. 2a).

### Case 2

A 2-year-old baby girl presented with a complaint of the cleft palate and the surgery was carried out with orotracheal intubation under general anesthesia. The patient's parents revealed no relevant medical history and no other underlying systemic illness was present. The surgical procedure was carried out similar to the first case, after the placement of the incision. While dissecting the mucoperiosteum on the nasal side of the palatal shelf, a tear was noted, and therefore, a BFP is pulled into the defect from either side and stabilized in the middle with sutures. Layer closure was carried out using 5–0 and 4–0 Vicryl sutures (Fig. 3). The patient was reviewed after 16 months; the donor site was healed well without esthetic or significant functional impairment (Fig. 2b).

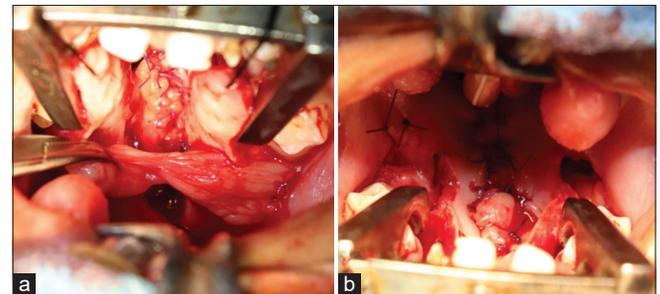
Both the above-mentioned patients were hospitalized for 2–3 days. A liquid diet was administered for 1 week and irrigation with normal saline was started immediately after surgery and continued several times a day until full epithelialization. Amoxicillin/clavulanic acid was prescribed prophylactically for 5 days. Patients were assessed weekly until full epithelialization. In the follow-up period, complete closure of the palate with an uneventful post-operative course and no recurrence after surgery was considered successful treatment.

### DISCUSSION

BFP was mentioned for the 1<sup>st</sup> time by Heister, in 1732, but only in the last quarter of this century has the BFP been used as a grafting source, and Egyedi first described the use of buccal pad of fat for closing an oronasal fistula [3]. However, their use in the repair of a primary cleft palate was first described in Chinese by Zhao *et al.* and Kaplan inserted a pedicled buccal mucosal flap at the junction between the hard and soft palate [4,5]. We describe here a technique for interposing a pedicled BFP in a wide primary cleft



**Figure 2:** Post-operative images after (a) 1–10 months (case 1); (b) 2–16 months (case 2)



**Figure 3:** (a) Harvesting buccal fat pad and suturing with nasal mucosa; (b) cleft palate closure (case 2)

palate, after releasing the nasal layer transversely at the site of maximum tension (the junction between the hard and soft palate).

The aim of surgical repair of palatal clefts includes achieving velopharyngeal competence, normal growth of the maxilla, closure of the palatal defect to achieve a partition between the nasal and oral cavities, and good speech [6,7]. Various surgical techniques which include von Langenbeck, Veau/Wardill/Kilner, and Furlow techniques have been used for cleft palate closure. Despite these myriads of surgical techniques aimed at repair, cleft late closure can be challenging due to wound dehiscence or flap necrosis with consequent development of fistulae may occur. The use of adjunctive flaps such as buccal mucosa flap, vomer flap, and tongue flap has gained popularity in both primary and secondary cleft palate repair [8].

The BFP is an encapsulated mass originated from a specific fat tissue in various volumes throughout the life of each person [9]. The BFP is located among the masseter and buccinator muscles, ascending ramus of the mandible, and the zygomatic arch and has been used in various surgeries as a source of useful graft material due to its easy accessibility and rich vascularization.

More recently, the utilization of the BFP was introduced and the technique of using a pedicled fat pad graft in conjunction with pedicled mucosal flaps offers distinct advantages: The fat pad helps to lengthen the soft palate without generating tension from the nasal side; a perforation may occur at the junction of the hard and soft palate postoperatively, in which case the graft serves as a bed for secondary granulation even if the oral layer has failed; the secondary lateral defect is also partly filled with the flap, which might help to reduce the amount of contracture; and even where the nasal layer need not be released, the pedicled BFP flap sandwiched in-between will always support the thin oral and nasal layers after radical dissection of the levator palate [10,11]. The other major advantage being it avoids the generation of a flap from other areas as in buccal myomucosal flap, as the flap is easily available from the lateral incision itself [12]. The advantages of the BFP graft are simplicity, ease of technique, high success rate and lack of visible scar, minimal discomfort, and a low case of complications.

Although its use as an adjunct flap in the repair of palatal clefts has been reported by few authors, it has shown encouraging results initially, yet there is a need to assess the long-term outcome of the palatal growth in non-cleft and cleft palatoplasty with or without pedicled BFP [13,14]. Although promising results from the use of BFP in palatal cleft surgeries have been published in various literature, the procedure is either not a common practice or is underreported in India.

## CONCLUSION

The surgical procedure for harvesting the buccal pad of fat is simple and has shown a high success rate. Successful application of BFP as an adjunct flap in palatal cleft closure is demonstrated in this series. It is recommended that cleft surgeons add this technique to their armamentarium in difficult cases, especially in wide palatal cleft repair, secondary palatal cleft repair, and in cases of inadvertent tearing of nasal mucosa during primary cleft palate repair.

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