

SIGNIFICANCE OF THE BUCCAL FAT PAD IN ORAL SURGERY

Mihailo Ostojić¹, Marija Pejić¹, Miroslav Oreščanin², Vladimir Biocanin¹

¹Faculty of Stomatology, Pančevo, Serbia

²Serbian Medical Society, Section Kragujevac, Kragujevac, Serbia

ZNAČAJ MASNOG JASTUČETA U ORALNOJ HIRURGIJI

Mihailo Ostojić¹, Marija Pejić¹, Miroslav Oreščanin², Vladimir Biočanin¹

¹Stomatološki fakultet, Pančevo

²Srpsko lekarsko društvo, Podružnica Kragujevac, Kragujevac

ABSTRACT

Buccal fat pad (BFP) is used in oral and maxillofacial surgery for closing oroantral communications (OAC), closing larger oroantral and oronasal defects, repairing congenital clefts, covering bone grafts, temporomandibular joint surgery and in aesthetic surgery. In daily oral surgery practice, the use of a BFP to close the OAC is indicated when there is a fistula on the mucosa of the vestibule, wide communication in the distal parts of the edentulous alveolar ridge and wide OAC in the region of the third molar and in cases of prominent coronoid process of the lower jaw.

Key words: buccal fat pad; oroantral communication; bisectomy.

INTRODUCTION

The use of a buccal fat pad (BFP) as a pedicled flap in the closing of oronasal and oroantral communications (OAC) formed after radical palatal tumor surgery was first described by Egyedi in 1977. In the last decades, the use of BFP has gained more and more popularity. In addition to closing oronasal and oroantral defects, it is also used in the repair of congenital cleft palates, to cover bone grafts, in temporomandibular joint surgery and in aesthetic surgery (removal of the buccal fat pad – Bisectomy), as well as a source of stem cells.

Embryology and significance of buccal fat pad

BFP (Bishat's fat pad) appears three months in utero and develops until birth. It represents the first fat tissue in the body that develops. During life, its volume does not change and is an average of 9.6 ml (8.3- 11.9 ml) and its weight is an average of 9.3 g. Properly dissected, a graft with an area 6x5x3 cm is provided, with average thickness of 6 mm and with that area it can cover a region of area 10 cm². In newborns, it helps in the act of sucking, by preventing the formation of negative pressure. It also plays a role in separating the masticatory muscles and the surrounding bony structures and protecting the surrounding neurovascular structures.

SAŽETAK

Masno jastuče obraza koristi se u oralnoj i maksilofacialnoj hirurgiji za zatvaranje oroantralne komunikacije, zatvaranje većih oroantralnih i oronazalnih defekata, reparaciju kongenitalnih rascepa, pokrivanje koštanih graftova, u hirurgiji temporomandibularnog zgloba i u estetskoj hirurgiji. U svakodnevnoj oralnohirurškoj praksi upotreba masnog jastučeta za zatvaranje oroantralne komunikacije indikovana je kad je prisutna fistula na sluzokoži vestibuluma, široka komunikacija u distalnim predelima bezubog alveolarnog grebena i široka oroantralna komunikacija u predelu trećeg molara i u slučajevima izraženog koronoidnog nastavka donje vilice.

Ključne reči: masno jastuče obraza; oroantralna komunikacija; bišektomija.

Anatomy of the buccal fat pad

BFP is located under the zygomatic bone and in front of the ramus of the mandible, surrounding the masseter and pterygoid medialis muscles and it belongs to the deep layer of fat tissue of the cheek which also consists of internal suborbicular fat tissue, external suborbicular fat tissue and deep fat tissue of the middle part of the cheek. BFP has a body and four extensions: buccal, temporal, pterygoid, and pterygopalatine. The body is located in the region of posterior maxilla surrounded by masticatory and buccinator muscles and zygomatic arch. It consists of three independent lobes covered by their own capsules – anterior, intermediate and posterior. More than half of the total mass is made up of the body and buccal extension. The buccal extension is located superficially and it gives the contour of the cheek. The pterygopalatine extension extends to the inferior orbital fissure and to the pterygopalatine fossa, and the pterygoid extension extends into the pterygomandibular space. The temporal extension has two parts – superficial and deep. The parotid duct, as well as the buccal and zygomatic branches of the facial nerve pass over the front and lateral surface of the BFP. The parotid duct pierces the buccinator muscle and opens in the oral cavity near the second upper molar. In 42% of cases, parotid duct passes over the buccal extension; in 26% of cases it passes through the extension itself and in 32% of cases it passes above the buccal extension. In 75% of cases, the anterior surface of the BFP is covered by the

buccal branches of the facial nerve, while the lateral surface is covered by zygomatic branches in 90% of cases.

Vascularization of the buccal fat pad

Blood supply is provided by the maxillary artery via the buccal and temporal branches, the superficial temporal artery and the facial artery. These arteries form the subcapsular plexus. Arterioles enter the capsule, extend along the pad's septa and finally form a plexus between adipocytes. Thanks to its rich vascularization, BFP can be used as a pedicled graft with a high success rate. The facial vein is responsible for venous drainage.

Application of a buccal fat pad for treatment of the oroantral communication

The formation of an oroantral communication because of an injury of the floor of the maxillary sinus due to tooth extraction in the upper jaw is a frequent complication. It occurs most often after the extraction of the upper first molars (more than 50% of cases), less often after the extraction of the second premolar, third molar and first premolar. The causes of the opening of an oroantral fistula can be anatomical, due to the existence of an inflammatory process or a radicular cyst in the region of the apex of the tooth root, or iatrogenic. The buccal advancement flap is in most cases the method of choice for communication closure, except in cases where the buccal mucosa is injured. In such situations, when suturing the flap to the palatal mucosa, the flap itself would be under tension and the depth of the vestibular sulcus would decrease. With the technique of closing the OAC with buccal fat pad, the

buccal flap is repositioned to its original position and there is no caudal displacement of the muscle insertions, thus avoiding subsequent surgical preprosthetic preparation. Also, due to the high rate of vascularization, the proximity of the recipient site, the low morbidity rate of the donor site and the simple surgical procedure, the use of BFP is also indicated when there is a fistula on the mucosa of the vestibule, wide communication in the distal parts of the edentulous alveolar ridge and wide OAC in the area of the third molar in cases of prominent coronoid extension of the lower jaw.

After the elevation of the buccal mucoperiosteal flap, in the region of the second and third upper molars, a 0.5 cm dissection of periosteum is formed with a scalpel. With a vascular clamp, blunt dissection is performed with passing through buccinator and zygomaticus major muscles and BFP is identified. By pulling out the clamp with open claws through the perforation made in the periosteum, with simultaneous pressure on the cheek, the pad spontaneously herniates in the oral cavity. BFP is pulled in the direction of least resistance (Figure 1). Once identified, aspiration is stopped, and the working field is dried with gauze. The movements of extraction of BFP must be gentle, so as not to tear the capsule and interrupt vascularization. After the defect is repaired, suturing can start. The BFP must be placed without any tension and suturing is done with resorbable sutures, horizontal mattress sutures so that the knot is always on the mucosa. This is ensured by separating the mucosa from the palatal bone, 3-4 mm from the edge of the defect. The flap is returned to its original position, sutured to the surrounding mucosa without tension, covering most of the BFP (Figure 2). The remaining, uncovered part spontaneously

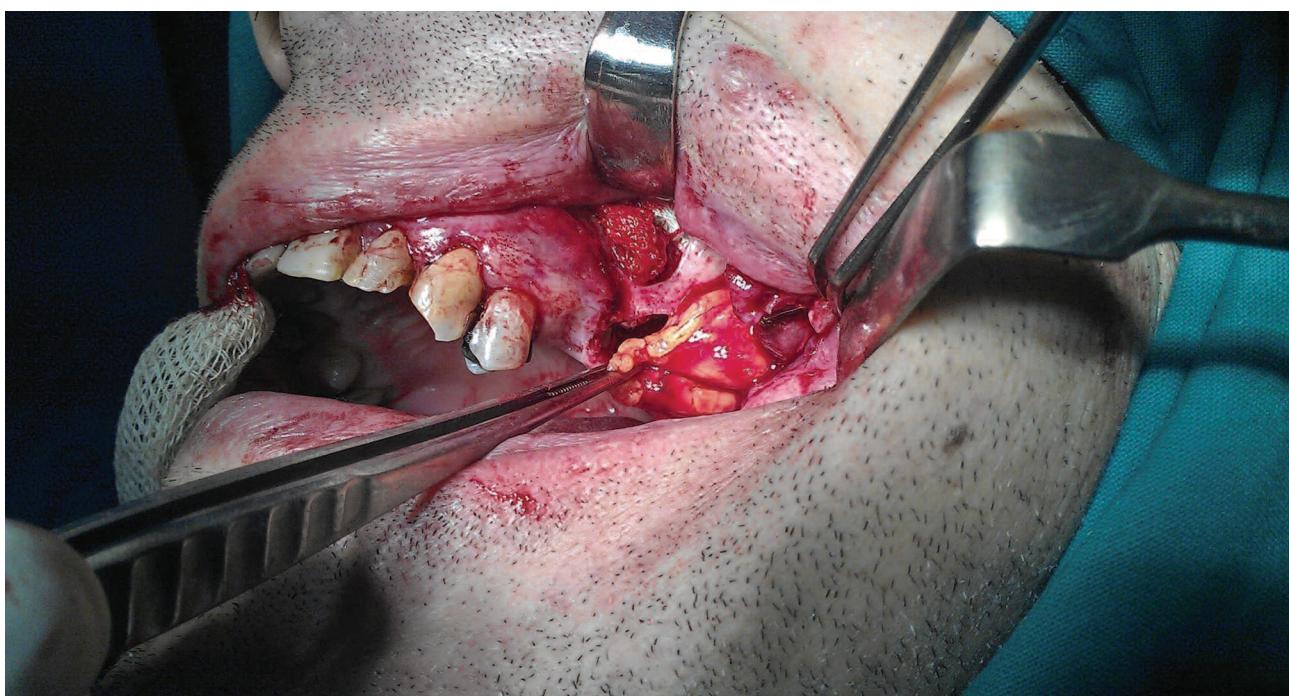


Figure 1. BFP for closing a large defect after removal of the fractured tuber

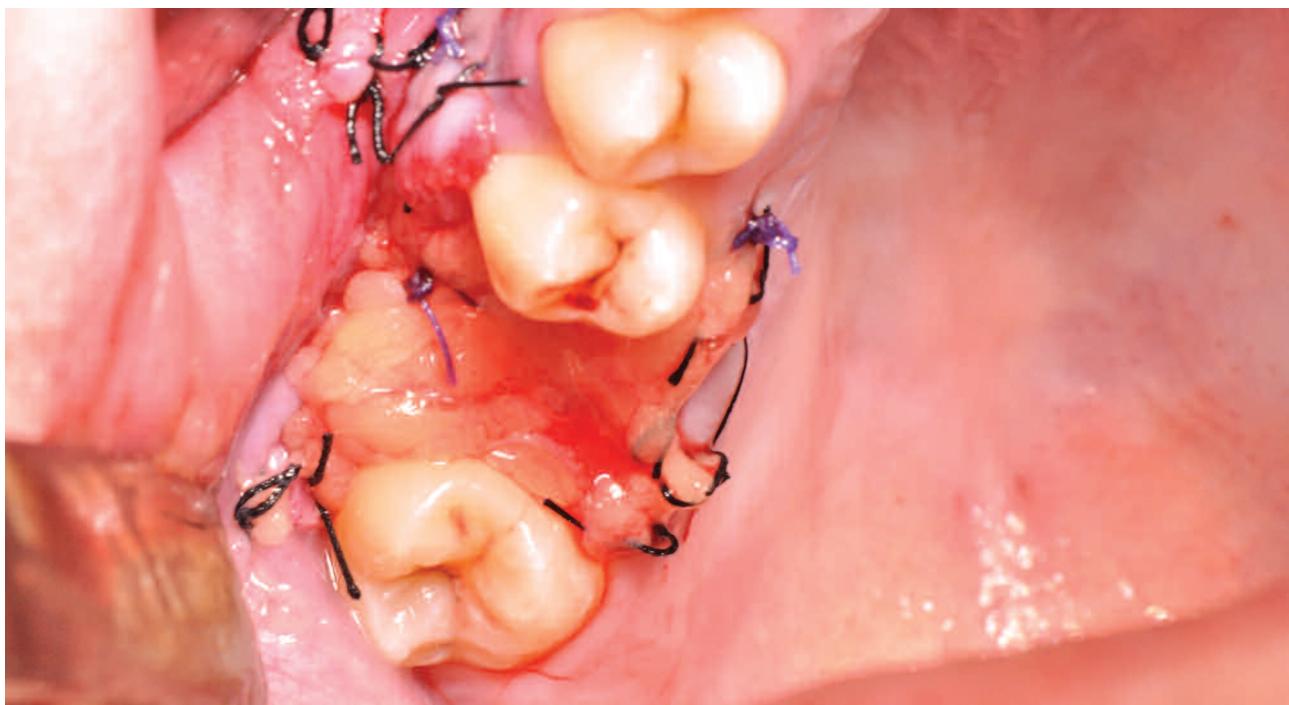


Figure 2. BFP sutured to the palatal mucosa and a tension-free flap partially pulled over it



Figure 3. The appearance of the region where the BFP was applied to close the OAC after 2 months from the operation

epithelializes in a period of up to three weeks (Figure 3). In the published literature, the success rate of this method is 96.2%. Reperforation of the communication occurred due to non-removal of the inflamed tissue, inexperience of the surgeon and due to the invasive approach.

REFERENCES

1. Egyedi P. Utilization of the buccal fat pad for closure of oro-antral and/or oro-nasal communications. *J Maxillofac Surg* 1977; 5: 241-4.
2. Petrović V, ur. Maxillary sinus in surgery of the orofacial region, Belgrade, Zavod za udžbenike i nastavna sredstva, 1992. (in Serbian).
3. Chouikh F, Dierks EJ. The buccal fat pad flap. *Oral Maxillofac Surg Clin North Am* 2021; 33: 177-84.
4. Rahpeyma A, Khajehahmadi S. Buccal fat pad graft in maxillofacial surgery. *Indian J Surg Oncol* 2021; 12: 802-7.
5. Subramaniam S, Gomez M, Maza G, Prevedello DM, Carrau RL. Does 3D volumetric analysis predict the reach of endoscopically harvested buccal fat pad flap. *Laryngoscope* 2020; 130: 1670-3.
6. Baumann A, Ewers R. Application of the buccal fat pad in oral reconstruction. *J Oral Maxillofac Surg* 2000; 58: 389-92.
7. Estler A, Grözinger G, Estler E, Hepp T, Feng YS, Daigeler A, Seabra Robalo Gomes Jorge AC, Santos Stahl A, Nikolaou K, Stahl S. Quantification of facial fat compartment variations: a three-dimensional morphometric analysis of the cheek. *Plast Reconstr Surg* 2023; 152: 617e-627e.
8. Stajčić Z. The buccal fat pad in the closure of oro-antral communications: a study of 56 cases. *J Craniomaxillofac Surg* 1992; 20: 193-7.