

CLOSURE OF OROANTRAL FISTULA BY USING BUCCAL FAT PAD – A CLINICAL STUDY

Sumit Verma¹, Gagan Khare², Pankaj Kukreja³, D.S. Gupta⁴, Kunwar Satish⁵, Mohsin Khan⁶
 Post Graduate Student¹, Professor^{2,4}, Professor & Head³, Reader⁵, Senior Lecturer⁶

1-6 - Department of Oral and Maxillofacial Surgery, Teerthankar Mahaveer Dental College and Research Centre, Moradabad

Abstract

Background: Oro-antral fistula is pathological communication between maxillary sinus and oral cavity, which is located between buccal vestibulum and antrum. If OAF persists that always causes chronic maxillary sinusitis. For the closure of a large OAF buccal pad of fat was used. Patients were selected randomly for management of OAF by BFP.

Materials and Method: This prospective study includes a total of 10 patients who reported to the department of oral and maxillofacial surgery. Patients were selected for closure of oro-antral fistula by using BFP and were evaluated for the effectiveness. Evaluation was done on the basis of following parameters: vestibular depth, infection, fistula recurrence and healing at various time intervals of 7th day, 15th day, and 30th day post-operatively.

Results: Among all the cases we found the mean of vestibular depth on 30th day and ± 7.05 , infection in 1 case each at 30th day post-operatively, unsatisfactory healing in one case each at 30th day post-operatively with one case showing fistula recurrence.

Conclusion: The result of our study with buccal pad of fat depicted that the high success rate was on the 30th post-operative day.

Key words: Oroantral Fistula, Oroantral Communication, Buccal fat Pad.

Introduction

The maxillary sinus is the largest paranasal sinus located in the body of the maxilla, which extends from the border of the alveolar process till the premolar and molar apices of the posterior most teeth. An oroantral fistula (OAF) is an unnatural epithelialized communication present in between the maxillary sinus and oral cavity.¹

Oroantral communication (OAC) can occur due to periapical cyst and tumor enucleations, implant placement, orthognathic surgery like Le Fort osteotomies, trauma, osteomyelitis, and various other pathological entities. Among all these causes the most common etiology of an OAC is extraction of the maxillary premolar and molar teeth, the thickness of the antral floor is very less, due to the approximation of the roots of the posterior teeth to the maxillary antrum.²

Oroantral fistula occurs after the complete pathological epithelialization of the OACs, which mostly occurs with complications after the extraction of maxillary posterior teeth. Along with OAC the presence of the causes that leads to the formation of the fistula are dental apical abscess, foreign bodies, maxillary sinusitis, osteomyelitis or osteitis, epithelialization of the fistula tract, dental cysts, or tumors, on the communication's margins, will prevent spontaneous healing and result in chronic fistula formation. It can be avoided by removal of pathologic features of the maxillary sinus. Drainage and proper aeration of the sinus should be achieved, and infected bone, degenerated polypoid mucosa, foreign body, should be immediately eliminated, and the defect should be surgically closed.² OAC are complex defects of the maxillary arch that involve hard and soft tissue. Mostly all acute oroantral communication, 1-2mm diameter will heal fastly after the blood clot formation and secondary healing will occur in the absence of maxillary sinus

infection. Large oroantral defects not diagnosed and left untreated heal rarely which leads to the formation of OAF.²

BFP was first described by Heister (1732), who thought the structure was glandular and termed it the 'glandula molaris'.³⁻⁹ The BFP is a rounded and biconvex structure. It is a very important structure that maintains the facial contour of an individual. It is made up of an adipose tissue which is covered by a thin capsule and embedded in both masticatory spaces in the Oral and Maxillofacial region.¹⁰

The BFP was first described by Heister (1732) and he believed this structure to be glandular in nature. Bichat (1802) is credited with recognizing the true fatty nature of the BFP. According to Sicher (1965) it is rounded, biconvex structure limited by a thin but distinctive capsule. The BFP represents a particular type of fat termed as syssarcosis, a fat that enhances inter-muscular motion.¹¹

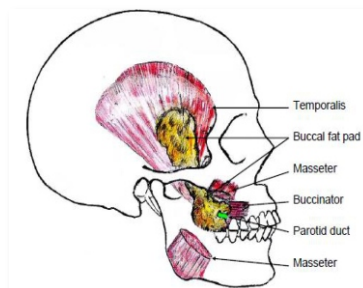


Figure 1- Anatomy of BFP

It is found in the masticatory space and is closely associated with the muscles of mastication, parotid duct and facial nerve. The BFP is composed of a main body and four extensions, superficial, buccal, pterygoid, and

deep temporal. The main body is situated deeply along the posterior aspects of maxilla and upper fibers of the buccinator. The buccal extension is found superficially within the cheek and is mainly responsible for cheek fullness. The pterygoid extension lies deep to the medial aspect of the mandibular ramus, resting between the ramus and the lateral surfaces of the medial and lateral pterygoid muscles (Figure1).The buccal extension is the largest segment accounting for 30-40% of the total weight.¹¹

The body is slightly smaller, representing 25-30% of total weight. The sizes of the pterygoid and deep temporal extension are variable but are generally smaller than either body or buccal extension. BFP then courses medially to lie on the periosteum of the posterior region of maxilla and passes superior to the upper fibres of buccinator muscle. Posteriorly it courses via pterygoid maxillary fissure in close relation with the maxillary artery.

Blood supply

BFP derives its blood supply from the buccal and deep temporal branches of the maxillary artery, transverse facial branches of the superficial temporal artery and branches of the facial artery. It is considered to be pedicled graft with an axial pattern due to its rich blood supply.¹²

Aim

To evaluate the efficacy of BFP for closure of oroantral communication or fistula.

Objectives

- To evaluate BFP for closure of oro-antral fistula.
- To evaluate the vestibular depth, infection, fistula recurrence and healing process.

Materials and Method

This prospective study includes a total of 10 patients who reported to the department of oral and maxillofacial surgery, Teerthanker Mahaveer Dental College and Research Centre, Moradabad, UP.

After proper medical history, thorough clinical examination, radiological examination, and routine blood investigation were done. Ten patients included in the study were randomly selected before operative procedure a surgical stunt was fabricated and given post operatively in the surgical site as and when required.

Before operative procedure a surgical stunt was fabricated and given post operatively in the surgical site as and when required (Figure 2). PNS and IOPA was taken to rule out patency preoperatively (Figure3). All the patients were operated under Local anesthesia.

Surgical technique

Among all patients with oro-antral fistula an incision was made around the fistulous tract 3-4 mm marginal to the orifice as the soft tissue aperture of the communication

was almost always smaller than the diameter of bony defect. The entire epithelialized tract along with the associated antral polyps margins was dissected and excised gingival margin freshened with blade no. 11. Technique used for OAC/OAF closure by Buccal pad of fat.

Two divergent incisions were given with blade no. 15, from each side of orifice into buccal sulcus for a distance of 2.5cm. These incision were made down till the bone while extending the incisions towards cheek, care was taken to avoid injury to papilla and duct of parotid salivary gland (Figure 4). The Palatal flap was also undermined so that the collagen membrane can be secured under it.

The BFP was harvested using an intraoral incision with a BP blade no 15. The incision was made high in the vestibule of maxillary teeth. The incision was made 5-6mm above the attached gingiva of maxillary IInd molar dissecting mucosa and buccinator exposing the periosteum. The BFP along with its capsule was then harvested and used to cover the defect. The BFP was secured to its position by 3-0 vicryl interrupted sutures. Irrigation was done with normal saline and communication was inspected to check any opening left behind, complete arrest of haemorrhage was achieved to prevent hematoma. The closure of wound is carried out with collagen membrane or buccal fat pad. The mucoperiosteal flap was then sutured into position across oro-antral fistula with 3-0 vicryl interrupted suture (Figure 5).



Figure 2: Preoperative and after acrylic stent



Figure 3: PNS view and IOPAR



Figure 4: Incision and mucoperiosteal flap reflected



Figure 5: BFP harvested and closure done with 3-0 vicryl



Figure 6: Follow up at 7th, 15th and 30th day

Results

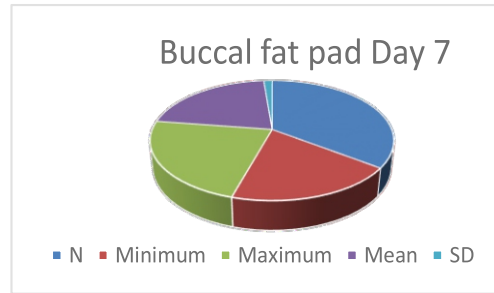
The study was conducted on 10 patients in department of oral and maxillofacial surgery for the treatment of oro-antral fistula closure under local anesthesia. Various parameters were evaluated to elicitate the successful outcome.

Vestibular Depth

Descriptive Statistics						
Tx Group	Vestibular Depth	N	Min	Max	Mean	SD
Buccal fat pad	Baseline	10	8.0	8.5	8.330	.2359
	Day 7	10	5.5	6.5	6.080	.3765
	Day 15	10	6.0	7.0	6.700	.3496
	Day 30	10	7.0	7.5	7.050	.1581

Table 1: Showing the vestibular depth at various time interval

This table and graph shows the mean value of vestibular depth for Buccal fat pad in post operative day 7 were 6.080 ± 0.37 similarly day 15 and day 30 was 6.70 ± 0.34 , 7.05 ± 0.15 (Table 1, Graph 1).

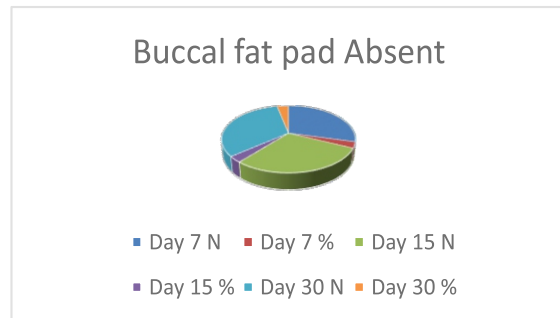


Graph-1 Graphical representation of the vestibular depth

Infection

TxGroup	Infection	Day 7		Day 15		Day 30	
		N	%	N	%	N	%
Buccal fat pad	Absent	8	80.0%	8	80.0%	9	90.0%
	Present	2	20.0%	2	20.0%	1	10.0%

Table 2: Showing the rate infection at various interval of time



Graph-2 Graphical representation of the rate of infection

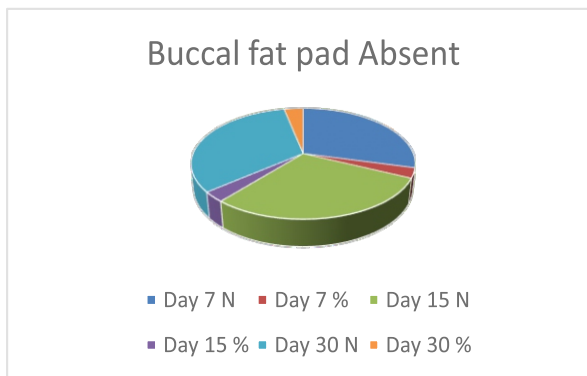
This table and graph shows post operatively in BFP group at 7th day and 15th day infection was found only in two patients, subsided on 30th day after taking medication (Table 2, Graph 2).

Fistula Recurrence

TxGroup	Fistula Recurrence	Day 7		Day 15		Day 30	
		N	%	N	%	N	%
Buccal fat pad	Absent	9	90.0%	9	90.0%	9	90.0%
	Present	1	10.0%	1	10.0%	1	10.0%

Table 3: Showing the fistula recurrence at various interval of time

Fistula recurrence is not statistically significant at any time interval. Fistula recurrence is clinically present only in one patient (Table 3, Graph 3).

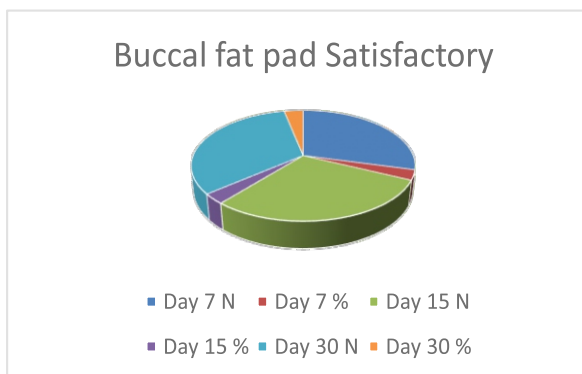


Graph 3: Graphical representation of fistula recurrence

Healing

TxGroup	Healing	Day 7		Day 15		Day 30	
		N	%	N	%	N	%
Buccal fat pad	Satisfactory	8	80.0%	8	80.0%	9	90.0%
	Unsatisfactory	2	20.0%	2	30.0%	1	10.0%

Table 4: Showing the healing rate satisfactory/unsatisfactory at various interval of time



Graph 4: Graphical representation of healing

This table and graph shows healing of infection in BFP is clinically more significant postoperatively on 7th day and 15th day and less clinically significant on 30th day (Table 4, Graph 4).

Discussion

Buccal fat pad is an adipose tissue of fatty mass, which is lobulated surrounded by slight capsule located in the masticatory space. The size of BFP is constant among all individuals despite of fat distribution and body weight. Blood supply to the BFP depends on branches of the facial, superficial temporal and maxillary arteries. It's generally used as a pedicled graft for reconstruction in oral surgery, including the closure of OACs or OAF.³ The body is slightly smaller, representing 25-30% of total weight. The sizes of the pterygoid and deep temporal

extension are inconsistent but are usually smaller than either body or buccal extension.¹¹

Alkan A et al¹⁰ (2003) in their study evaluated 23 patients who had oro-antral communication (OAC) following extraction of maxillary teeth, out of which 11 underwent primary closure with the buccal fat pad, 4 patients were treated with the BFP after unsuccessful attempts at fistulae closure using different techniques. All patients were followed up for at least 4 weeks postoperatively and were recalled for final assessment at 6 months infection was noticed in only 2 of the patients, who had large maxillary defects, on the 3rd postoperative days.¹⁰ In our study presence of infection was noted and not statistically significant at Day 7 but subsequently at Day 15th and at Day 30th the infection was clinically significantly in Buccal fat pad group.

Hanazawa Y et al¹³ performed a procedure and result was successful in 13 of 14 patients. Postoperatively, the orally exposed fat gradually was transformed into a granulation-like tissue and epithelization developed within 3 weeks.¹³ In our study healing of infection is not statistically significant at any time interval ($P > 0.05$) the healing of infection is significantly present buccal fat of fat. Healing of infection in BFP was clinically more significant post operatively on 7th day and 15th day and less clinically significant on 30th day.

Conclusion

In this study 10 patients with oroantral fistula were included; the parameters evaluated were vestibular depth, infection, fistula recurrence and healing process.

The present study, within its limitations, has shown that – Post operative reduction in vestibular depth was clinically significant after closure with BFP on the 7th day, 15th day, and 30th day. Post operative infection was clinically significant on the 7th and 15th day which subsided by medication on 30th day. Post operative fistula recurrence was clinically significant on 7th day, 15th day and 30th day. Post operative healing was satisfactory in 9 patients on 30th day and unsatisfactory in one patient on last post operative day.

The Buccal pad of fat is a simple and effective option for minimizing the postsurgical morbidity linked with all the parameters. However further studies with a larger sample size are required in this direction.

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Corresponding Author

Dr. Sumit Verma
 Post Graduate Student
 Department of Oral and Maxillofacial Surgery
 TMDCRC, Moradabad
 Email: sumitv306@gmail.com

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