

Closure of Oroantral Fistula Comparison of Buccal Advancement Flap and Buccal Fat Pad

ABDUL RASHID¹, AHMED SHAKEEL AHSAN RIZWI², MIRZA ABDUL RAUF³, HAFSA SHAFIQ⁴

ABSTRACT

Our aim was to compare the efficacy of two procedures i.e. buccal advancement flap and buccal fat pad for closure of oro-antral fistula. Results showed that the use of buccal advancement flap technique is a simple, convenient and reliable method for the repair of small to medium sized OAF, however an additional surgery may be required to reestablish the proper vestibular depth. Contrary to it BFP owing to its physical and biological properties can be used for a variety of purposes, but its most common use is the closure of large posterior OACs followed by post excision reconstruction.

Keywords: Oro-Antral fistula, Flap.

INTRODUCTION

The Oroantral Fistula (OAF) is a pathological communication between the oral cavity and the maxillary sinus¹. It is an uncommon complication that occurs mostly at the site of extracted maxillary first molars². The primary cause of OAF is close relation of roots to maxillary sinus. Other causes are dental infections, sinus trauma while surgery³.

The choice of the appropriate therapy should be based on certain criteria like the width, epithelialization and presence or absence of infections⁴. Defects less than 3mm in width and without epithelialization might heal spontaneously in the absence of infections. The communications wider than 5mm require the rotating or sliding flaps to provide closure, provided that infection must be dealt pre-operatively to avoid impaired drainage⁵.

If the communication is not diagnosed and managed properly, there is a risk of developing an epithelialized oroantral fistula permanently. In this case the risk of food and saliva contamination can lead to bacterial infection, impaired healing and resultant maxillary sinusitis⁶.

Several surgical methods of repair have been described⁷. Traditional methods include buccal advancement flaps, palatal rotation and transposition flaps, tongue flaps, nasolabial flaps and Buccal Fat Pad (BFP)⁸. None of these flap techniques is superior to the other, but in context of their own merits and demerits.

Buccal Fat Pad (BFP) got certain advantages such as: excellent blood supply and minimal donor site morbidity^{9,10}. However, some disadvantages also exist like a mild reduction in the vestibular height, slight swelling and recurrence. The loss of vestibule depth represents a serious problem in patients wearing removable dentures. It requires an additional vestibuloplasty¹¹. Another technique for closure of OAF is Buccal Advancement Flap¹².

MATERIAL AND METHODS

Inclusion Criteria:

1. All patients irrespective of age and gender.
2. Long standing fistula.
3. Failure of primary closure.
4. Defect greater than 5mm.

Exclusion Criteria:

1. Immunocompromised Patients.
2. Previously operated Patients.
3. Patients with chronic infections.
4. Presence of sinusitis.

Patients were divided into two groups; group A and group B. Patients treated with buccal fat pad were included in group A whereas patients treated with buccal advancement flap in group B. Each group consists of 20 patients. All the patients in the present study presented with delayed OAF after tooth extraction. Data recorded included age, sex, medical history, etiology, fistula location size and duration, complication, duration till complete healing and sinus disease. Pre-operative systemic evaluation and laboratory investigations were performed for all the included patients. Pre-operative oral hygiene was accomplished using antiseptic mouth wash and either by scaling or pocket curettage. The diagnosis of OAF was made by the nose blowing test and probing (the introduction of a probe into the antrum through the fistula). Panoramic view radiographs were taken

¹Specialist Classified-Fauji Foundation Hospital Lahore & Associate Professor of Oral and Maxillofacial Surgery, Shalimar Medical and Dental Collage

²Specialist Classified-Fauji Foundation Hospital Lahore & Assistant Professor of ENT Shalimar Medical and Dental Collage.

³Associate Professor of Oral and Maxillofacial Surgery. Islam Medical and Dental Collage Sialkot.

⁴Internee at Fauji Foundation Hospital Lahore

Correspondence to Dr. Abdul Rashid Email: abdulrahidmaxfac@gmail.com Cell: 0300-9490508,

preoperatively to access an accurate size of the bony defect and the presence or location of dental roots or implants that may have been pushed into the antrum. Also computed tomography on the sinuses was obtained to evaluate the presence of sinusitis.

Post-operatively the patients were instructed not to chew or swallow hard food and to drink fluid away from the operative side. Nose blowing and sneezing with a closed mouth were prohibited for 2 weeks and not to roll the tongue over the suture line or the flap for the 1st week post operation. All our patients received intra-operative and postoperative antimicrobial treatment for 10 days. Non-steroidal anti-inflammatory drugs (NSAIDs) were prescribed for pain control. Patients were examined every week during the 1st post-operative month and the every 2 weeks during the 2nd and 3rd months then every month till 1 year post operatively. These patients were examined searching for the recurrence of the fistula or infection and chewing difficulties and healing of the denuded areas of the hard palate.

RESULTS

In this study 20 patients were treated in each group. There were 13 males and 7 females in group A whereas 15 males and 5 females in group B, with age range from 23 years to 46 years and a mean age of 35.5 years. All had an oro-antral fistulae with a defect size ranging from 0.3 to 1.3 cm in diameter and a mean diameter of about 0.54 cm. We preferred BFP when the defect size was >5 mm; whereas smaller defects were treated with BAF. There were 16 defects after extraction of 1st molar tooth, 03 after 2nd Molar and only 01 defects after extraction of the 2nd premolar in Group A whereas 18 defects after 1st Molar extraction and 02 defects after 2nd Molar surgery in Group B. The interval from fistula development to surgical repair was 1 month to 7 months with a mean interval period of about 3.4 months. There were 3 patients with diabetes mellitus, 01 in group A and 02 in group B, two of them recovered while in the third diabetic patient proper healing could not be achieved. Five recurrent cases were reported; 03 in group A and 02 in group B; most probable cause was persistence of local infection. The hospital stay ranged from 2 days to 7 days in the postoperative period with a mean period of about 3.5 days. All patients reported difficulties in swallowing and chewing which was improved post-operatively. The most annoying post-operative symptom was fullness at the gingiva-labial sulcus at the base of the buccal flap which led to difficulty in the movement of the cheek. Despite that, there was no speech disturbance reported in patients treated by the presented techniques.

A good result was considered as the absence of fistula and sinusitis and it was clinically verified. Culture sensitivity tests for bacteria were done in 13 cases among both groups that presented secretion with pus, revealing *Streptococcus pneumoniae* (8 cases), *Haemophilus influenzae* (3 cases), *Moraxella catarrhalis* (01 case), and *Staphylococcus aureus* (01 case). A second surgical procedure was done in 04 patients with recurrence, 01 patient did not agree to undergo the second procedure, considering himself pleased with the first operation. Six months following the treatment, 17 patients were examined in group A and 16 patients in group B that were considered as cured.

DISCUSSION

The closure of the OAF is one of the most challenging and difficult problems in the field of oral surgery¹³. The ultimate goal should be the establishment of physiological functions of the stomatognathic and respiratory system¹⁴⁻¹⁵. Numerous modalities are used for the closure of the OAF including the buccal flaps, palatal flaps and the distant flaps. Although none of these methods proved to be superior but certain advantages and disadvantages exist among them.

The most common cause for the development of OAF is tooth extraction. Punwutukorn et al. showed that extraction of the upper 1st molars is the most common etiologic factor for oroantral communications¹⁶. In our patients, we found the same scenario of the development of the OAF. So in this context the results of our study were found similar to those of previous studies.

There are certain factors which prevent spontaneous healing, these include the size of the fistula, sinus infection, osteitis, epithelialization of the fistula tract and systemic disease like diabetes¹⁷. In our study, we also found diabetic mellitus to be the major cause of delayed healing or healing failure.

Despite the easier surgical procedure, perfusion of buccal flaps is poor and narrowing of the gingivobuccal sulcus may occur¹⁸. In spite of the high success rate, failure possibility is present and patients should be informed about the need for another trial for closure of the OAF. Finally it should be kept in mind that the immediate closure of the OAF has a high success rate which is significantly higher than the closure of chronic fistula¹⁹⁻²¹.

There were certain limitations in our study like the number of treated patients was relatively less than other comparable studies reported in literature. However, this article has shown the BFP technique to be a simple but useful tool in the armamentarium of the operator to close an oroantral communication. It

is recommended in those situations where loss of sulcus depth is of concern, or where the buccal advancement flap has failed²².

CONCLUSION

The use of buccal advancement flap technique is a simple, convenient and reliable method for the repair of small to medium sized OAF, however an additional surgery may be required to reestablish the proper vestibular depth. Contrary to it BFP owing to its physical and biological properties can be used for a variety of purposes, but its most common use is the closure of large posterior OACs followed by post excision reconstruction.

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