

Comparison of two Surgical Procedures in the Management of Oroantral Fistula

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ABSTRACT

OBJECTIVE: To compare between double layer closure and buccal advancement flap in the management of Oro-antral fistula

METHODOLOGY: This Comparative cross sectional study was conducted on 30 patients with oral antral fistula in Maxillofacial Surgery Department, Liaquat University of Medical & Health sciences Hyderabad. The study was conducted from March 2013 to February 2019. Selection of patients was made on inclusion criteria of patient having OAF for more than 15 days, irrespective of location and side. Patients who developed Oro-antral fistula (OAF) because of any pathology or its treatment, and patient having bleeding tendency were excluded. Division of two groups to avoid any bias in this study was done by using random number table. Group-I was treated with buccal advancement flap while group-II with "double layer closure "with buccal fat pad" and 2nd layer with buccal advancement. The outcome was evaluated for any postoperative complications like wound dehiscence, necrosis, infection.

RESULTS: Males and females were 67% and 33% respectively. The mean age was 35.03±9.56 years. Maxillary molars were the common site for OAF. Maxillary first molar followed by second molar site was ranked according to frequency of this condition. Buccal advancement procedure was used in group A and in this cluster 86.6% cases were successful. In Group B, a double layered closure procedure was used and the success rate was 93.3% which is statistically not significant.

CONCLUSION: Double-layered closure using BFP with buccal advancement flap should be kept as a valuable option in mind in the management of OAF.

KEY WORDS: Buccal Advancement Flap, Oro-Antral Fistula, Buccal Fat Pad, Double Layered Closed Technique.

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INTRODUCTION

Oro-antral fistula (OAF) is a persistent abnormal communication of oral cavity with maxillary sinus¹. The incidence of OAF ranges from four to seven percent of cases after extraction of maxillary posterior teeth². Males are more commonly develop OAF than females as suggested by literature³.

The most frequent cause underlying OAF is surgical extraction of the second premolar and of the first and second molars of the upper jaw (the latter also being referred to as "antral teeth") This is due to the proximity between the apexes of these teeth and the maxillary sinus, with a distance of 1-7 mm, or to root protrusion into the floor of the maxillary sinus secondary to important pneumatization of the latter². OAF may arise due to any pathological process like after enucleation of cysts, resection of tumor or post traumatic defects, dental infection, and osteomyelitis^{1,2}.

OAF that facilitate microbial contamination from the oral cavity towards the maxillary sinus to avoid bacterial infection and chronic sinusitis it is necessary to close OAF as soon as possible^{1,2}. Minor

communications of 2mm or less than that usually heals spontaneously with passage of time without infection, if sinus precautions are advised at the time of extraction of tooth. Larger defects of more than 2mm or chronic OAF need almost always surgical repair³. Parapical X rays, OPG, CT scan CBCT may suggest different findings according to cause of fistula like sinus floor dis-continuity after faulty extraction, opacity of affected maxillary sinus may suggest sinusitis, alveolar bone resorption or well-defined radiolucent lesion could be a cyst.³ Closures of OAF can be performed with Different mucoperiosteal flaps. As every flap have certain indications, advantages and disadvantages. Appropriate surgical procedure has to be taken while considering the width, epithelization and existence of infections or not. Infection of maxillary sinus must be addressed before closure to avoid impaired wound healing^{2,4}. Buccal advancement, palatal advancement or rotational flap, naso-labial flap, tongue flap are commonly used methods to close OAF⁵. Buccal fat of pad with various advantages are being introduced to repair of oro-antral fistula (OAF) and other oral defect created by any lesion especially at buccal mucosa⁶.

In 1977, Egyedi P 1977⁸ use BFP to close oro-antral defects as a pedicled flap for the 1st time in history as an innovative method to closed OAF and showed successful cases. The BFP is a biconvex disc of vascularized fat lying behind the zygomatic arch. There are four processes, the buccal, the pterygoid, the superficial and the deep temporal. These processes broaden from the pterygo-mandibular space and the infra-temporal space⁷. This flap can be used for closure of oro-antral communications and in the reconstruction of minor oral defects. This Flap usually have highest success rate as compare to other flaps with only minor post-operative complications observed⁶. As in routine dentistry we must have knowledge regarding development of OAF. Effective closure is paramount important to overcome this condition so the purpose of this study was to compare the outcome between single layer closure (Buccal advancement flap) and double layer (Buccal advancement and buccal fat pad flap) techniques.

METHODOLOGY

This Comparative cross sectional study was conducted on 30 patients with oral antral fistula in Maxillofacial Surgery Department, Liaquat University of Medical & Health sciences Hyderabad from March 2013 to February 2019. Non probability purposive sampling technique was used for data collection. Selection of patients was made on inclusion criteria of patient having OAF for more than 15 days, irrespective of location and side. Patients who developed OAF because of any pathology or its treatment and patients having bleeding tendency were excluded. Patients were divided into two groups by randomization of even and odd methods. Patients in Group-A were treated with buccal advancement flap; Group-B patients were treated with double layer closure with buccal fat pad and 2nd layer with buccal advancement.

Patients in group A were treated with buccal advancement flap. After infiltration of local anesthesia Xylocaine 2% with adrenaline 1;10000 at the buccal and palatal side of fistula, fistula lining was removed and the flap was raised by making two buccal divergent vertical incisions extending into the buccal vestibule from fistula with blade no 15. The trapezoidal buccal flap was elevated and brought across the defect and sutured to the palatal side with Vicryl (Ethicon) 2/0. Broad base was kept in consideration to ensure adequate blood supply.

While in Group B buccal advancement flap was done along with buccal Fat pad. Buccal fat pad is located between buccinator muscle and masseter, zygomaticus minor muscle. The lower part of BFP is enclosed to buccal space. After reflection of buccal advancement flap as mentioned in group A, a mosquito forcep was used in upward direction through buccal space to retrieve buccal fat pad. The tissues

were gently teased out of sufficient size till it reached to palatal side to close the defect as 1st layer and sutures were applied than buccal advancement flap were taken over the buccal fat pad as 2nd layer and stitched with suture on palatal side.

The outcome of procedure was evaluated for any postoperative complications like wound dehiscence, necrosis, infection. Complete epithelization and healing observed with no postoperative complications like pain, blowing the nose, swelling, etc; was known as successful technique.

All information of variables was documented in a structured proforma. Data was analyzed by SPSS version 17. Mean and standard deviation was calculated for continuous variables like age. Frequency and percentage were calculated for categorical variables like gender, age groups, site of distribution, groups of study like buccal Advancement flap and double layered closure. The chi square test was applied between the study groups and performed procedures to check the statistical difference and significance. The significance was set at p-value ≤ 0.05 at 95% confidence interval.

RESULTS

Thirty patients were selected for this study during this study. Males and females were 67% and 33% respectively. The male to female ratio was 2:1 (Figure I). The age of the patients ranged from 15 to 70 years with the mean age of 35.03 ± 9.56 SD years. Out of the 30 patients 13 (43%) patients were in the third decade of life followed by 10 (33%) in fourth decade as shown in Table I.

Buccal advancement flaps were used in group I and 86.6% cases were successful. In Group B, double layered closure procedure was used and the success rate was 93.3% which is statistically not significant (p-value = 0.586) as shown Table II.

FIGURE I: DESCRIPTION OF GENDER

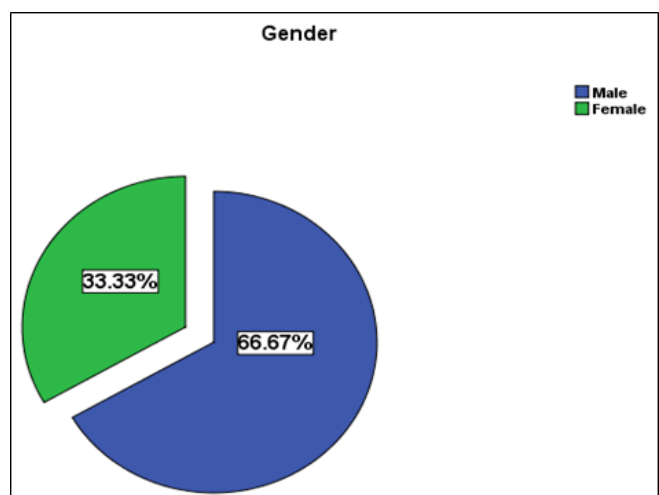


TABLE I: DESCRIPTION OF AGE

Age	Frequency	%	Mean Age
15-20	2	6.6	
21-30	13	43.3	
31-40	10	33.3	
41-50	3	10	35.03±9.56
51-60	1	3.3	
61-70	1	3.3	
Total	30	100	

TABLE II: COMPARISON BETWEEN BUCCAL ADVANCEMENT FLAP AND DOUBLE LAYERED CLOSURED (n=30) (Chi square test)

Procedure performed	Successful	Unsuccessful	P-Value
Buccal Advancement flap (Group-A) n-15	13 (86.7%)	2(13.3%)	
Double layered closed (Group-B) n-15	14(93.3%)	1(6.7%)	0.586
Total Number = N 30	27(90%)	3(10%)	

DISCUSSION

This study found that OAF had a greater male preponderance than female with 2:1 being the male to female ratio. Several studies reported similar results. Delgado revealed that out of 22 patients, 58% were males and 42% were females, with a male to female ratio of 1.4:1⁹. Hirata Y et al¹⁰ demonstrated that the incidence of OAF is essentially higher in men with a male to female ratio of 1.7:1. By and large the age of patients at the time of reporting was 17 to 68 years with the mean being 35.3±9.56 years. In a total of 30 patients 44% were in the 3rd decade of life while 33% in the 4th decade.

Guyen O 1998¹¹ and Elarbi MS 2006¹² showed similar results to this study i.e. OAF was more prevalent in the 3rd and 4th decade, According to Archer, three factors are imperative for the successful survival of flap in the surgical closure of OAF which are the perfusion of the flap, the bypass of the sinus' secretions, the sinus should be infection free during the course of the procedure. For the very same reason it is crucial to use antibiotics pre and post-operatively.

It has been observed by many investigators that buccal fat pad is a time consumable procedure and technique sensitive, perforation or shrinkage are complications if used alone^{7,8}. Egyedi P 1977⁸ emphasized to use skin graft to cover buccal fat pad

however Tideman H 1986¹⁴ reported that BFP become self-epithelialized in couple of weeks of its inset. Larger defects can be adequately managed by covering the BFP with buccal advancement flap. Combine technique has added advantage of stability of tissue at surgical site and it can also help for future bone grafting^{7,13}.

Comparison between the relationship of the buccal flap and sinusitis was done by Dym H 2001¹⁵ who showed that if maxillary sinus was infection free the risk of flap failure before and after closure became close to zero.

Group A buccal advancement flap were used. In this group, 87% cases were termed as successful and 13% unsuccessful. The failures of the 2 cases were investigated. One failed due to postoperative infection while in other flap dehiscence due to improper postoperative care was to be blamed. Zide MF 1992¹⁶ noted that the reduction in sulcular depth was a direct implication of using buccal advancement flap procedure. Elarbi MS 2006¹² on the other hand, found that this reduced sulcular depth was transient. Models of patient before and after surgery following 8 weeks confirmed that this reduced depth increased to a normal height. In Group B buccal advancement with buccal fat pad (BFP) was used to close the OAF, 93% cases were successful. One case was failed which was later investigated and the reason was osteomyelitis of maxilla. Limited studies been published in literature for double layer closure¹⁷⁻¹⁹. It provides more reliable results and stability of flap. Stajcis Z 1992¹⁷ advocated the use of the buccal fat pad for OAF closure. In other study Candamoury R 2012¹⁸ used double layered closure and found that it is very useful for OAF closure.

CONCLUSION

With this small sample size, we cannot conclude any technique is superior to other. Surgeon's experience and preference is also important consideration to choose the technique. Further broad based studies are recommended for comparison of both techniques.

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AUTHOR CONTRIBUTIONS

Channar KA: Topic selection, selection of subjects
 Shaikh IA: Help in scientific research and review
 Memon AB: Data analysis
 Soomro SN: Data interpretation
 Baloch AJ: References setting
 Najam S: Data collection

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