Original Article

BUCCAL ADVANCEMENT FLAP VS PALATAL ROTATION FLAP IN THE MANAGEMENT OF OROANTRAL FISTULA

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ABSTRACT

Objective: *The aim of the study was to compare the outcome of the buccal advancement flap and palatal rotation flap in the management of oroantral fistula.*

Methodology: *The study was carried out on 60 patients with oroantral fistula who reported to Department of Oral & Maxillofacial Surgery, Khyber College of Dentistry Peshawar during August 2004 to July 2007. They were divided into two groups. In group A, oroantral fistula was repaired with buccal advancement flap while in group B palatal rotation flap was performed. The diagnostic criteria's used were history, clinical examination, periapical views, OPG and PNS views.*

Results: *Oro-antral fistula was predominantly common in males (61.7%). The mean age of the patient calculated was 34.03 ± 10.56 years. Out of the 60 patients, 41.6% were in the third decade followed by 36.76% in fourth decade. Maxillary first molar was the most common site of oroantral fistula (60%) followed by second molar (30%). In 52% of cases, Oro-antral fistula was found on the left side while the right side was involved in 48% cases. Out of 60 patients, 95% cases were successful and 5% cases failed. In Group A, the failure rate was 7.14% while in group B, failure rate was 3.45%.*

Conclusion: *This study shows that both buccal advancement flap and palatal rotation flap are good surgical procedures with beneficial surgical outcome for Oro-antral fistula closure. The palatal rotation flap was more successful of the two flap procedures, showing half the failure rate of buccal advancement flap.*

Key Words: *Oroantral Fistula, Buccal Advancement Flap, Palatal Rotation Flap.*

INTRODUCTION

The abnormal communication between the oral cavity and maxillary sinus lined by epithelium is called oroantral fistula (OAF)[1]. Oroantral communication (OAC) and subsequent formation of OAF is a common complication of dental extraction of maxillary premolar and molars[2]. Chronic OAF may complicate into chronic sinusitis as its sequelae[3].

In 95% cases oroantral fistula develops due to the extraction of maxillary molars[4]. The removal of the maxillary 1st permanent molar is the most common cause for OAF[5,6,7]. Clinically, patients suffering from OAF, present with nasal phonation, regurgitation of food or fluid from oral cavity into the antrum and then into the nose. Patient is unable to blow the wind instruments or drink through a straw due to the escape of air from mouth into the nose. Foul smelling, discharge is seen filling the nose or exuding from the fistulous tract into the mouth. Sometimes an antral polyp in the alveolar socket can be seen[8].

Mostly the buccal advancement flap and palatal rotation flap techniques are used for the repair of oroantral fistula. The success of any procedure depends upon local and general factors i.e. elimination of sinus infection, excision of fistulous tract and proper postoperative care[9]. Many studies have shown that the buccal pad advancement flap is more successful in comparison with palatal rotation flap[10]. In case of the chronic OAF repair with palatal rotation flap is more beneficial due to increased vascularity, thickness and maintenance of the buccal sulcus[11]. The

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good length to width ratio of palatal rotational flap has given good results in oroantral fistula arising in last maxillary molar region[12]. 'The use of some alloplastic material has also been proposed which ranged from auto-geneous bone graft to gold foil[13,14]. In recent years the use of a pedicle buccal fat pad in the closure of large oroantral fistula has become popular[10]. Distant flaps from the extremities or forehead or tongue are also in use[15].

The purpose of the study is to compare the buccal advancement flap vs. palatal rotation flapin the closure of OAF and to find out which surgical procedure is beneficial. Moreover a better flap choice will help to prevent the morbidity associated with persistentOAF and will decrease the burden on the patients quality of life.

MATERIALS AND METHODS

This study was carried out in the Department of Oral & Maxillofacial Surgery, Khyber College of Dentistry Peshawar from August 2004 to July 2007. A total of sixty patients with oroantral fistula were recruited in the study. A written approval was obtained from the Institutional Ethical Review committee. They were divided into two groups, with 30 patients in each group. In group A, buccal advancement flap and in group B, pedicle palatal rotation flap procedure was applied. All the procedures were performed by an Oral and Maxillofacial consultant. Non-probability Sampling Technique was adopted. Patients who developed oroantral fistula due to tooth extraction were included in the study. These patients were diagnosed on the basis of clinical examination, specific tests of nose blowing and other related investigations like X-Rays, periapical views, OPG and PNS View. All those patients who developed oroantral fistula due to malignancy of the sinus or posterior maxillary alveolar ridge were excluded from the study.All the necessary information about the variables was collected in a specially designed performa. The study design was Quasi experimental.

Written and informed consent for evaluation and intended surgical intervention was taken from the patient. All patients' undergoing surgical procedures for closure of oroantral fistula were reviewed at weekly interval for one month for the outcome.

Data was analyzed by descriptive statistics i.e. mean ± SD deviation; frequencies were calculated for age and duration of oroantral fistula. Percentages and frequencies were calculated for site, side, and gender. Rate of success / failure for each procedure as well as in each group for gender were calculated. SPSS version 17.0 was used for statistical analysis.

RESULTS

A total of 60 patients were included in this study. The result of this study shows that OAF was more common in males (61.7%) than females (38.3%). The male to female ratio was 1.6:1. The age of the patients ranged from 17 to 68 years with the mean age of 34.03 ± 10.56 years. Out of the 60 patients 41.6% were in the third decade of life followed by 36.76% inforth decade. The details of the age distribution are given in Table 1. In 52% cases OAF was found on the left side while the right side maxillary sinus was involved in 48% cases.

Maxillary first molar was the most common site in the creation of oroantral fistula (60%) followed by second molar (30%) and last molar (6%). The details of site distribution are given in Figure-1.

Table 1: Age distribution of OAF patients

Age in Years	n	%
15-20	3	5
21-30	25	41.7
31-40	22	36.7
41-50	6	10
51-60	2	3.3
61-70	2	3.3
Total	**60**	**100**

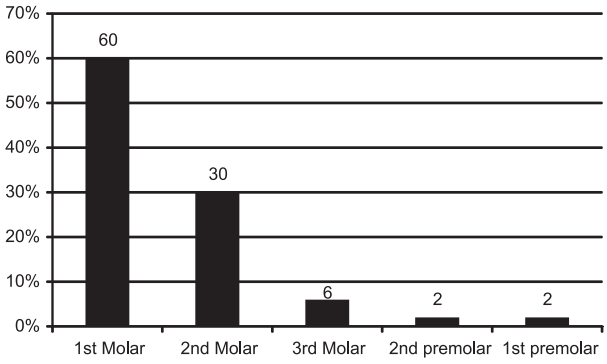

Fig. 1: Site distribution of OAF

Table 2: Postoperative results of BAF and PRF

Procedure	Successful		Failed		Total No. of patients
	n	%	n	%	
Buccal advancement flap	28	93.33	2	6.67	30
Palatal Rotation Flap	29	96.67	1	3.33	30
Total	**57**	**95**	**3**	**5**	**60**

In Group A, buccal advancement procedure was used and in this group 93.33% cases were successful. In Group B, palatal rotation flap procedures was used and the success rate was 96.67% as shown Table-2.

DISCUSSION

In this study OAF was more common in males (61.7%) than females (38.3%). The male to female ratio was 1.6:1. Delgado[16] reported that out of the 22 eases of OAF 13 (58%) were males and 9 (42%) were females with male to female ratio of 1.4:1. The study of Hirata et al[17] showed that the rate of oroantral fistula is significantly higher in males with a male to female ratio of 1.7:1.

Generally the age for the patients at the time of presentation was 17 to 68 years with the mean age of 34.03 $\pm$ 10.56 years. Out of the 60 patients 41.6% were in the 3rd decade followed by 36.67% in 4th decade. Guven[18] findings also correlate with the results of the present study i.e. the incidence was higher in 3rd and 4th decade. Similar results were reported by Elarbi[19].

Archer[20] considered three factors in the success of any flap operation performed for the closure of oroantral fistula. Namely, adequate vascularization of the flap, diversion of the antral secretion into nose and antrum must be free of infection, for which the use of pre and post-operative antibioticis mandatory. A study on OAF conducted by Shah[9] at de Montmorency College of Dentistry Lahore concluded that the success of any procedure for oroantral fistula repair depends on elimination of sinus infection, excision of fistulous tract and proper postoperative care. Woweren[21] studied the relation between the buccal flap and sinusitis and concluded that the risk of failure is negligible by eliminating maxillary sinusitis before and after closure, which explains the failure of cases in the present study.

In Group-A, buccal advancement procedure was used, in those cases, which had a small opening and deep buccal sulcus. The group that undergone buccal advancement flap procedure 28 cases were successful and 2 failed. The failures of the 2 cases were investigated. One case failed because of the postoperative infection, the other case failed because of the flap dehiscence due to the patient carelessness in the postoperative period. Woweren[7] and Zide et al[23] have criticized the buccal advancement flap for the decreased depth of the sulcus[23,24]. However Eneroth et al[24] showed the reduced depth of the sulcusto be a temporary problem. These authors used models of the patient before and after surgery and showed that the reduced depth became normal after 8 weeks. According to Kruger[25] this procedure is very common, simple and satisfactory which can be performed under local anesthesia.

In the Group-B, palatal rotation flap procedure was performed. In this group only one case failed due to the postoperative sinusitis. According to Anavi[11] et al, palatal rotation flap is recommended for the late repair of oroantral fistula owing to its good vascularization, excellent thickness and tissue bulk and easy accessibility. It also allows for the maintenance of the vestibular-sulcus depth. It is particularly indicated in cases of unsuccessful buccal flap closure. Donor site necrosis is a very rare complication of palatal rotational flaps. Contrary to this, Erdegon et al[26] reported a case of 43-year-old female, Type I diabetic patient with a chronic oroantral fistula in the right second molar region. The patient had bony necrosis in the donor site following palatal rotational flap operation.

CONCLUSION

This study shows that both buccal advancement flap and palatal rotation flap are good surgical procedures with the palatal rotation flap showing a considerably less failure rate than the buccal advancement flap.

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