

TREATMENT OF OROANTRAL FISTULA – A STUDY

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ABSTRACT

The aim of this study was to evaluate and analyze the occurrence, characteristics and treatment outcome of oroantral fistula in 29 patients from Sept 2004 to Nov 2009. These patients were examined both clinically and radio-logically for oroantral fistula. Data regarding the age, gender, cause and site of fistula and treatment outcome was evaluated and reviewed. The age range was 18-60 years with high frequency occurring in 31-40 years. Male outnumbered female. The common cause of OAF was extraction of teeth (n=25, 86.5%) followed by cysts (n=2, 6.7%). The most common involved tooth in the causation of OAF was upper first molar (n=13, 52%). Surgical technique used to close the fistula was buccal advancement flap. Recurrence of fistula occurred in 2 patients (6.7%) and were re-operated using the palatal flap. The merits and demerits of the procedure are discussed.

Key Words: Oroantral fistula, buccal advancement flap, chronic sinusitis.

INTRODUCTION

Oroantral communication followed by oroantral fistula (OAF) is a rare surgical complication in oral and maxillofacial surgery.¹ The maxillary sinus occupies an important place in oral and maxillofacial surgery owing to its close anatomic relationship to the apices of posterior maxillary teeth.² Maxillary sinus is also known as Highmore's antrum. At birth the maxillary sinus is a small cavity and its growth begins in the third month of fetal life and ends at the age of 20 years. Due to its small size in children and adolescents the risk of OAF is comparatively low.³ Previous reports show that OAF commonly occur after the third decade of life.⁴ It is more frequent in males^{4,5} and occurs mostly in the second and first molars followed by second premolar teeth.^{6,7} Common causes of OAF are extraction of teeth, maxillary cysts, benign and malignant tumors and trauma.^{7,8}

Signs and symptoms include purulent discharge through the fistula, entering of water into nose and air

hisses from the fistula into mouth.³ Usual radiologic findings include sinus floor discontinuity, opacification of sinus, focal alveolar atrophy and associated periodontal disease.⁹ Small fistulae tend to heal spontaneously, whereas larger fistulae rarely heal.⁴ Surgery is indicated if a fistula does not heal within three weeks.^{4,5,6} Surgery aims to promote ventilation and aeration of maxillary sinus, to remove diseased bone and to resect the thickened epithelium along the borders of fistula. Selection of the treatment strategy is influenced by the amount and condition of the tissue available for repair and the possible placement of dental implants in future.¹⁰ Surgical success depends on the technique, the site and size of fistula and the presence or absence of sinus infection.¹¹ Sinus disease is commonly treated surgically by a maxillary sinusotomy, according to the Caldwell-Luc technique, followed by middle meotomy.^{3,11}

The most common surgical procedure used for the OAF repair is the buccal advancement flap designed by Rehrmann.¹² In this procedure, a broad-based trapezoid

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mucoperiosteal flap is created and suture over the defect. Its broad base ensures adequate blood supply and, consequently, high success rate (93%) had been reported.² Disadvantages of this procedure include the obliteration of gingivolabial sulcus, making it difficult to use prosthesis in future. An alternative method for the closure of OAF is the use of palatal flap. The palatal flap ensures better blood perfusion, but the technique is difficult and time consuming. The palatal bone is exposed leading to prolonged healing time and pain.¹³ Buccal fat pad can be used for OAF repair due to its proximity to recipient site¹⁴ Tongue flaps created from dorsal, ventral or lateral aspects are also used for OAF repair⁸ A variety of grafts, including autogenous bone, allogeneous materials, xenografts and synthetic materials have been used with a varying success^{8, 15, 16, 17}

METHODOLOGY

This study was carried out on 29 patients, at Khyber College of Dentistry, Peshawar (19 patients) and the private clinic of the principal author at Mardan (10 patients) from Sept 2004 to Nov 2009. Patients diagnosed with oroantral fistula and treated surgically

TABLE 1: AGE DISTRIBUTION OF PATIENTS

(N=29)		
Age groups (Years)	No of patients	Percentage
11-20	2	6.8
21-30	4	13.7
31-40	13	44.8
41-50	7	24.1
51-60	3	10.3

under general anesthesia with buccal advancement flap procedure were included in the study. Patients having any severe systemic disease were excluded from the study. With the consent of the patients all the necessary information about the variables of the study written in preformed proforma were collected by history, clinical examination and radiographic study. Acute sinus disease was treated with antibiotics while chronic sinus disease underwent Caldwell-Luc procedure. Post-operative care included antibiotics, nasal decongestants, NSAID, instruction to avoid tooth brushing or touching the site with the tongue, avoid blowing or using the dental prosthesis for seven days. Patients follow up was performed at 15 days, one month and four months. The data so obtained were evaluated and analyzed by applying descriptive statistics.

RESULTS

The most common age group involved was 31-40 years with a mean value 43.5 years (Table1). Gender distribution showed that 18 (62%) were male and 11 (38%) were female (Fig 1). The common cause of OAF was extraction of teeth (n=25, 86.5%) followed by cysts (n=2, 6.7%) and trauma (n=2, 6.7%), (Fig 2). The most common involved tooth in the causation of OAF was upper first molar (n=13, 52%), followed by upper second molar (n=9, 36%), (Fig 3). Surgical technique used to close the fistula was buccal advancement flap. Recurrence of fistula occurred in 2 patients (6.7%). These cases were re-operated using the palatal flaps with uneventful outcome.

DISCUSSION

The maxillary sinus reaches its greatest size during the third decade of life; consequently, the incidence of OAF is higher after that age.^{4, 18, 19} It is considered that

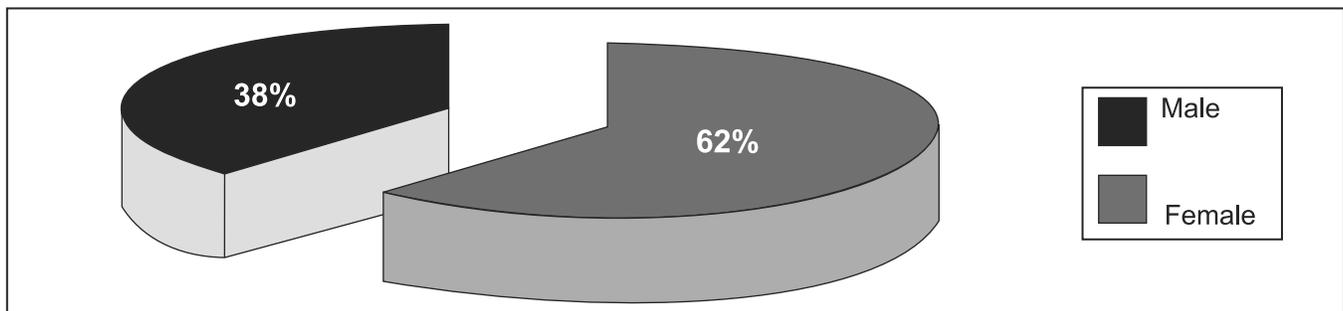


Fig 1: Gender distribution of patients (n = 29)

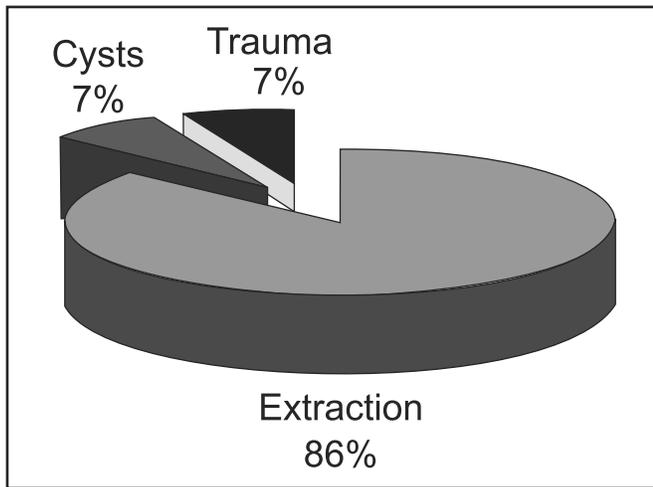


Fig 2: Causes of oroantral fistula (n = 29)

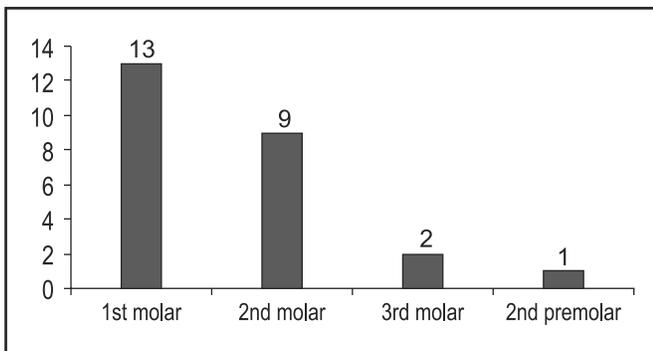


Fig 3: Site of oroantral fistula due to extraction (n = 25)

the loss of teeth experienced with advancing age increases the likelihood of fistulas. Previous reports^{1, 4, 5, 7, 18, 19, 20} and our findings are in agreement that the most common age group involved was 31-40 years. The occurrence of OAF in children and adolescents is reduced due to small size of sinus.³ Present study shows that OAF is common in male. Previous results also show similar findings regarding the gender distribution.^{1, 5, 20, 21} Investigations have shown that the pneumatization of the jaw in men and women is identical.⁹ The high number of male in our study may be attributed to more common and more traumatic tooth extraction in them. Lin et al in 1991 reported that female exhibit larger sinuses than male and there is, therefore, greater possibility of OAF in them.²⁰

Extraction of teeth was the common cause and first maxillary molar was most commonly involved tooth in the formation of OAF in present study. Similar results about the cause and site have been reported in previous

studies.^{1, 3, 5, 7, 11, 21} The relationship of the maxillary sinus floor to the posterior teeth is important, because the floor can extend to the apex of dental roots, or go even deeper between them. Such roots are separated from the sinus by a thin bony lamella and its mucous membrane, or by the mucous membrane of the sinus alone.

Smaller fistula less than 3mm heal spontaneously provided the sinus wall and mucosa are healthy.⁸ Furthermore, the length and width of the extraction socket is also of critical importance.¹ Shorter and wide extraction socket unfavorably heal spontaneously.^{1, 7} The presence of sinusitis, foreign bodies, dental cysts, apical abscess, tumors, infected and degenerated polypoid mucosa and infected bone prevents spontaneous healing.^{1, 5, 7} The underlying acute sinusitis is treated by medical treatment (antibiotics, nasal decongestants and analgesics), while the chronic sinusitis is treated by endoscopic sinus surgery (ESS) or Caldwell-Luc procedure.^{3, 7, 11}

In this study the surgical procedure used to close the OAF was buccal advancement flap. Twenty seven patients had successful outcome, while there was recurrence of fistula in 2 patients. Recurrence was treated using the palatal flap. Overall, the success rate (93.3%) of buccal advancement flap is similar to international studies done in the past.^{2, 3, 4, 5, 7, 8, 22} Buccal advancement flap was used because of its reliability, versatility, straightforwardness, ease of performance and better perfusion.^{1, 5, 7} The communication can be closed with one layer, if the tissue around the opening is cut and removed or in two layers if the partial elliptical incision of soft tissue from the vestibular and palatal side is turned and carried over the opening.³ The base of the flap is wider which ensures adequate blood supply to the flap. Coverage of the flap improves by horizontal periosteal incision at base.³ Kay and Kelly²² reported success with this method in 93% of cases in their study. Despite the easier surgical procedure, these flaps are not preferred in larger and recurrent fistulas.⁷ Narrowing of gingivobuccal sulcus may occur. Von Wovern²³ considers it a temporary complication, whereas Amaratunga²⁴ reported it as a permanent complication of buccal advancement flap procedure.

For uneventful outcome the epithelium along the fistular tract must be removed, mucosa should be

debrided up to the well perfused tissue, and the infected bone should be curetted. The site of anastomosis should be free of tension and situated over intact alveolar bone. Antibiotics, oral care, nasal decongestants, and analgesics are recommended postoperatively. Blowing of nose should be avoided in these patients.

CONCLUSION

All the cases in this study were treated with buccal advancement flap. Two recurrences were noted and were re-operated using palatal flap. This study showed that buccal advancement flap procedure is simple, reliable, easy to perform and well tolerated by patients with OAF with excellent results, provided the underlying sinusitis is managed accordingly.

REFERENCES

- Elarbi MS. The management of an oroantral fistula—a clinical study of 30 cases. *Pak Oral Dent J* 2006; 26: 55-58.
- Visscher SH, Minnen BV, Bos RRM. Closure of oroantral communications: a review of the literature. *J Oral Maxillofac Surg* 2010; 68: 1384-91.
- Sokler K, Vuksan V, Lauc T. Treatment of oroantral fistula. *Acta Stomatol Croat* 2002; 36: 135-40.
- Güven O. A clinical study on oroantral fistula. *J Cranio-maxillofac Surg* 1998; 26: 267-71.
- Yimaz T, Suslu AE, Gursel B. Treatment of oroantral fistula: experience with 27 cases. *Am J Otolaryngol* 2003; 24: 221-23.
- Haas R, Watzak G, Baron M, Tepper G, Maliath G, Watzek G. A preliminary study of monocortical bone grafts for oroantral fistula closure. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2003; 96: 263-66.
- Hernando J, Gallego L, Junquera L, Villarreal P. Oroantral communications. A retrospective analysis. *Med Oral Patol Oral Cir Bucal* 2010; 15: 499-503.
- Abuabara A, Cortez AL, Passeri LA, Moraes M, Moreira RW. Evaluation of different treatments for oroantral/oronasal communications: experience of 112 cases. *Int J Oral Maxillofac Surg* 2006; 35: 155-58.
- Abraham JJ, Berger SB. Oral-maxillary sinus fistula (oroantral fistula): clinical features and findings on multiplanar CT. *Am J Roentgenol* 1995; 165: 1273-76.
- Awang MN. Closure of oroantral fistula. *Int J Oral Maxillofac Surg* 1988; 17: 110-13.
- Meirelles RC, Neves-Pinto RM. Oroantral fistula and genian mucosal flap: a review of 25 cases. *Rev Bras Otorrinolaringol* 2008; 74: 85-90.
- Rehrmann A. A method of closure of oroantral perforation. *Dtsch Zahnärztl Z* 1936; 39:1136-39.
- Lee JJ, Kok SH, Chang HH, Yang PJ, Hahn LJ, Kuo YS. Repair of oroantral communications in the third molar region by random palatal flap. *Int J Oral Maxillofac Surg* 2002; 31: 677-80.
- Junior JM, Kiem FS, Kreibich MS. Closure of oroantral communication using buccal fat pad graft—case report. *Int Arch Otorhinolaryngol* 2008; 12: 450-53.
- Dergin G, Gurler G, Gursy B. Modified connective tissue flap: a new approach to closure of an oroantral fistula. *Br J Oral Maxillofac Surg* 2007; 45: 251-52.
- Thoma K, Pajarola GF, Gratz KW, Schmidlin PR. Bioabsorbable root analogue for closure of oroantral communications after tooth extraction: a prospective case-cohort study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2006; 101: 558-64.
- Ogunsalu C. A new surgical management for oroantral communication: the resorbable guided tissue regeneration membrane- bone substitute sandwich technique. *West Ind Med J* 2005; 54: 261-63.
- Anavi Y, Gal G, Silfen R, Calderon S. Palatal rotation- advancement flap for delayed repair of oroantral fistula: a retrospective evaluation of 63 cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2003; 96: 527-34.
- Egyedi P. Utilization of the buccal fat pad for closure of oroantral fistula and/or oro-nasal communications. *J Maxillofac Surg* 1977; 5: 241-44.
- Lin PT, Bukachevsky R, Blake M. Management of odontogenic sinusitis with persistent oroantral fistula. *Ear Nose Throat J* 1991; 70: 488-90.
- Punwutikoran J, Waikakul A, Pairuchvej V. Clinically significant oroantral communications- a study of incidence and site. *Int J Oral Maxillofac Surg* 1994; 23: 19-21.
- Killy HC, Kay LW. Observations based on the surgical closure of 362 oroantral fistulas. *Int Surg* 1972; 57: 545-49.
- Von Wovern N. Closure of oroantral fistula with buccal flap: Rehrmann versus Moczar. *Int J Oral Surg* 1982; 11: 156-59.
- Amaratunga NA. Oroantral fistula: a study of clinical, radiological and treatment aspects. *Br J Oral Maxillofac Surg* 1986; 24: 433-37.