

PALATAL ROTATION FLAP FOR CLOSURE OF ORO-ANTRAL FISTULA : A CASE REPORT

ABSTRACT

Oroantral fistula can occur following extraction of tooth with close proximity of roots to the sinus. It need to be addressed early due to risk of infection to the maxillary sinus and associated patient discomfort. Various options are available for the closure of OAF, like buccal advancement flap, buccal fat pad graft, tongue flaps etc. Here we are discussing a case where post extraction OAF was closed using palatal pedicled rotation flap, with successful closure of the fistula and uneventful healing.

Key words : Oro-antral fistula , palatal rotational flap , maxillary sinus, sinus regimen.

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INTRODUCTION

Oral fistula (OAF) is defined as existence of pathological epithelised tract between the oral cavity and maxillary sinus which has its origin either from iatrogenic complications or from dental infections, osteomyelitis, radiation therapy or trauma. Oroantral fistula (OAF) most commonly occurs as a complication of maxillary molar or premolar extraction (48%). The primary reason is the anatomic proximity of the root apices to the sinus floor or projection of the roots within the maxillary sinus¹. It is characterized by the presence of epithelium arising from the oral mucosa and/or from the antral sinus mucosa that, if not removed, could inhibit spontaneous healing. Oroantral communications (OAF) of less than 4 mm in diameter tend to close spontaneously, whereas those larger than that accompanied by inflammation of the sinus, alveolus or, periodontal regions require surgical closure². Closure of communication can be achieved using different flaps which show both advantages and limitations.

Maxillofacial reconstruction involves the prudent utilisation of an array of local tissue rearrangement and regional flaps. The closer the flap donor site is to the defect, the less morbidity is associated with the reconstructive surgery. Flaps from local tissue also carry the advantages of having similar colour and texture. Therefore, the palatal flap remains popular in reconstructing intraoral defects; moreover, the palatal flap is the only available flap that can provide keratinized mucosa for defect reconstruction³.

The palatal flap was initially described in 1922 by Victor Veau to address oronasal fistulas associated with cleft repair. It was later popularized by Millard for palatal lengthening during cleft repair in the 1960s; however, it was Gullane and Arena who used the flap for post ablativedefect⁴. Recent modifications emphasize on use of palatal flap in surgical closure of oroantral fistula.

CASE REPORT

A 35 old female patient was referred to our institute for management of oroantral fistula. The patient gave a history of extraction of upper left first molar fifteen days back. She presented with nasal regurgitation of fluids, halitosis and pain in the region. The clinical

examination showed an oroantral fistula of 10mm in relation to 26 region. There was active discharge from the sinus intraorally. A clinical diagnosis of OAF was made. IOPA was taken and supported the clinical diagnosis.



Figure 1. IOPA of 26 region

SURGICAL PROCEDURE

The patients were given antral regimen for a week for sinus infection and associated symptoms. All the surgeries were performed under local anaesthesia with 2% lignocaine and 1:80000 adrenaline. After preparation of the surgical site, greater palatine and posterior superior alveolar nerve block was given. A circular incision with a 3mm margin was made around the fistula to excise completely the epithelial layer and inflammatory tissue within the opening before raising a flap. Thorough saline irrigation of sinus was done until a clear discharge obtained.

The palatal flap was planned according to the site and size of the defect. The palatal fibro-



Figure 2: Circular incision



Figure 3: Incision for palatal flap

mucosa was incised to raise a partial thickness mucoperiosteal flap having a posterior base supplied by the greater palatine artery. The anterior extension of the flap was made wide to exceed the diameter of the bony defect and sufficiently long to allow lateral rotation. The periosteal layer was left over the bone to enhance secondary healing. Once the flap is elevated, it is rotated and sutured on the donor site without any tension using 3-0 vicryl. A bactigrass dressing was stabilized over the donor site with coe- pak. The patient was prescribed Amoxicillin and clavulanic acid, anti-inflammatory analgesics, antihistamines, and decongestant nasal drops for five days. They were instructed to avoid strong sneezing and not to use a straw while drinking and was kept under a soft diet. The patients were followed weekly during the first month, which



Figure 4: Rotated flap

showed no wound dehiscence and predictable secondary healing at the donor site with fibrin cover in the first post op week. By the second week defect was fully covered with granulation tissue, there was no pain or signs of infection. Absolute take up of the flap and healing of the donor site similar to that of normal mucosa was achieved in three months.

DISCUSSION

Oroantral fistula is an abnormal epithelized communication between the oral and sinus cavity through perforation in the sinus wall. It commonly occurs after extraction of maxillary posterior tooth with close sinus approximation. Other causes are trauma, enucleation of cyst and tumours in the maxilla, due to osteomyelitis and as a complication of implant surgery. Oroantral fistula can be either alveolar, sublabial or palatal. Signs of a fresh OAF during dental extraction is root disappearance and positive nose blowing test, where as the symptoms of fresh OAF is nasal regurgitation of fluids, epistaxis, air escape from mouth to nose, enhanced column of air, alteration of vocal resonance, and extruding pain in and around sinus. Symptoms of established OAF is pain, purulent nasal discharge, post nasal drip, fever, malaise, antral polyp etc.

In a patient having healthy sinus, an OAC less than 4-5mm in diameter will most likely heal spontaneously. In case of larger perforations, treatment methods include the use of local flaps, distant flaps and grafting procedures such as palatal, buccal, or combined mucoperiosteal flaps⁵. None of these methods were proved to be superior to the other.



Figure 5: Sutured flap

However, certain advantages and disadvantages do exist. According to Lore, small oroantral fistula 1 to 2 mm, usually close spontaneously, fistula from 3 to 4 mm are usually successfully closed with a buccal flap and fistulae 5 mm and larger require a more extensive surgical procedure using a large palatal flap⁶. Different techniques have been described in literature for the closure of oroantralfistula, with the first and most used being Rehrmannbuccal advancement flap. Egyedi in 1977 first described the use of buccal fat pad graft⁷. The major disadvantage of Rehrmann flap is the loss of sulcus depth. In Moczair flap buccal pedicle is laterally displaced, causing less reduction in sulcus depth and is commonly used in when edentulous area is there in and around the area of OAF. Buccal fat pad is the most discussed in current literature, used commonly for larger and posteriorly located defect. Advantage of buccal fat pad is that it is highly vascular, can reepithelise, no loss of sulcus depth can be harvested near the repair site. Palatal pedicle flap for closure of oroantral fistula was first described in 1939 by Ashley. The relatively simple anatomy of the palatal flap is one of its

many advantages. It can be a flap of choice for smaller and moderate size defect, since it does not effect the buccal vestibular height. Some authors suggest the use of palatal flap for OAF of larger the 10 mm⁸. Palatal flap has the advantage of having generous thickness and texture ,resistant to laceration and abundant keratinised mucosa. Eventhough the palatal flap has limited elasticity it can provide satisfactory displacement to close the defect. Donor site discomfort is another disadvantage, which can be managed with dressings that cover the defect. Palatal flap can be straight advancement, rotational advancement, hinged and island flap.

The palatine mucosa is underlined by the sub mucosa that is closely adherent to the periosteum. The periosteum is attached to the bone of the hard palate by dense sharpey’s fibers. The palatal flap is an axial flap based on the greater palatine artery. The connection between the two greater palatine arteries across the midline has been termed the macronet and allows the entire flap to be based on a single greater palatine arterial supply⁹.This anatomy greatly increases the

METHODS TO CLOSE OROANTRAL FISTULA

AUTOGENOUS	SOFT TISSUE FLAP	LOCAL	Rehrmannbuccal advancement flap, Moczairbuccal sliding flap, Buccal transposition flap, Buccal fat pad ⁶ , Palatal transposition flap, Palatal submucosalfalp, Palatal island flap, alatal submucosal island flap, Hinge [Inversion]flap, Buccal and palatal bipediced[bridge] flap, Tunnel palatal flap, anteriorly based palatal flap etc.
		DISTANT	Tongue flap, Nasolabial flap, Buccinatormyomucosal island flap, Temporalis myofascial flap
	BONE GRAFT		Chin, Retromolar region,Zygoma,Illiaccrrest
ALLOGENOUS			Fibrin glue, Dura
XENOGRAFT			Collagen, Gelatin, Bio-O97ss, Bioguide
SYNTHETIC MATERIAL			Gold, Aluminium, Tantalum, Hydroxyapatite
OTHERS			Acrylic splints, Guided tissue regeneration, Interseptalalveotomy, Pro -Laminin gel , third molars

Table 1: Methods of closure of OAF

versatility of the flap. Straight advancement flap does not provide sufficient mobility, whereas palatal rotation advancement flap have the ability to rotate 180 degrees and to be placed in the oral cavity mucosal side up or down allows be considered as a reliable back up procedure in the event of failure of other techniques nearly 360-degree availability along the entire pedicle¹⁰.

Rotation about a 180 degree axis and ability to invert the flap allow coverage in any direction. With this versatility noted, one of the most significant limitations of this the flap is short distance that it may travel to a defect. The flap is limited by its neurovascular supply, which emerges from the bony canal of the greater palatine foramen.

Mobilization and rotation of the flap can lead to kinking, for which Kruger has suggested a v - shaped excision along the lesser curvature¹¹. Some times this back cut given to avoid kinking can cause necrosis jeopardising the blood supply. When a partial thickness flap is rased, the overlying periosteum enhanced healing and reduced healing time. The design of the flap used in our case was in such a way that the length to width ratio is 2.1. Terminal part of the greater palatine artery is a nasopalatine branch, which ascends through the incisive foramen and anastomoses with the septal branches of the sphenopalatine artery. Thus a retrograde flow through the nasopalatine artery can occur when the greater palatine neurovascular bundle is transacted. An appropriate length/width ratio is important for the success of palatal flap. The length/width ratio is below 2.15 is desirable, whereas significant edge necrosis and repair failure is seen with a ratio above 2.49¹². Considering the wide variety of options for the reconstruction of post traumatic and post ablative intraoral defects, the palatal flaps hold many advantages over other forms of reconstruction. It has been used successfully with minimal morbidity for reconstruction of defects within the reach of the flap. The cases presented here in demonstrate the versatility of the flap.

CONCLUSION

From our experience we can conclude that palatal rotation flap is a reliable flap for the repair of oroantral fistula. The easy mobilization of the palatal rotation flap and its excellent blood supply and minimal donor site morbidity make it an ideal flap.

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