



Verma's Stepped Palatal Flap: A New Technique for the Management of Oroantral Fistula

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ABSTRACT

Oroantral communication (OAC) is an unnatural communication between the oral cavity and maxillary sinus which gets epithelized over a period of time leading to formation of oroantral fistula (OAF). It is an uncommon complication of extraction of maxillary posterior teeth and may occur after surgical procedures involving the maxillary antrum. Various techniques have been documented in literature for the management of oroantral fistula (OAF). Buccal sliding flap and palatal pedicle flap are the two most commonly used techniques. The purpose of this article is to present "Stepped Palatal Flap" in the management of oroantral fistula.

KEYWORDS : Buccal Sliding Flap, Palatal Pedicle Flap, Stepped Palatal Flap, Oroantral Fistula, Oroantral Communication.

INTRODUCTION

Oroantral communication (OAC) is an unnatural communication between the oral cavity and maxillary sinus. OAC is an uncommon complication after extraction of maxillary posterior teeth. The most commonly involved tooth is maxillary first molar followed by second molar, third molar and premolar [1-4]. OAC of 5 mm in size may heal by themselves. If the OAC is not diagnosed and treated properly, there is epithelization of the OAC leading to formation of oroantral fistula (OAF). Maxillary sinusitis is a prevalent complication after establishment of OAF [5]. To prevent development of these secondary complications, primary closure of OAC is advocated within 24-48 hours [6]. The primary etiology of OAC is anatomic approximation of the roots of maxillary posterior teeth with the maxillary sinus. Other causes of OAC are destruction of portion of the sinus with pathologies such as cysts, benign or malignant tumors, dentoalveolar infections, trauma, implant surgeries and Paget's disease [7-9].

Buccal sliding flap and palatal pedicle flap are the two most commonly used techniques. The purpose of this article is to present "Stepped Palatal Flap" in the management of oroantral fistula (OAF).

TECHNIQUE

This technique can be carried out under local anesthesia with or without sedation. Strict sterilization protocol must be followed throughout the surgical procedure. After administration of local anesthesia, epithelial lining of the fistula is removed. A healthy mucosa 2-3 mm should be excised all around the fistula leading to resultant surgical defect with healthy and fresh raw margins [Figure 1].

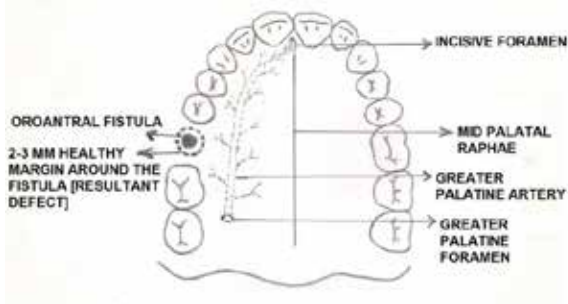


Figure 1- OAF excision along with 2-3 mm of healthy margin around it.

The outline of the "Stepped Palatal Flap" is marked on the palate. Posteriorly the flap extends up to the greater palatine foramen [Figure 2].

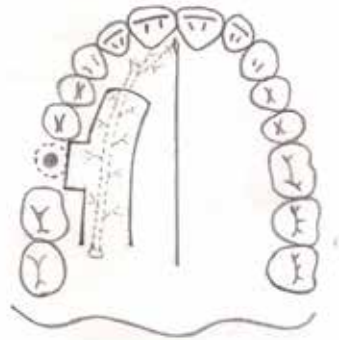


Figure 2- Outline of "Stepped Palatal Flap".

The Stepped Palatal Flap is based on the greater palatine vascular pedicle. The flap typically has three parts. The first anterior part has a curvature (C) and width (W). The curvature (C) has the dimension sufficient to cover the bucco-lingual width of the resultant surgical defect. The width (W) should be of sufficient dimension to cover the mesio-distal dimension of edentulous space having the surgical defect [Figure 3].

The second part is in the form of step having length (L) and height (H). The length (L) is equal to mesio-distal dimension of edentulous space having the surgical defect. The height (H) does not have any fixed dimension. Its dimension depends on the palatal margin of the resultant surgical defect and the lateral curvature of the flap (curvature toward the teeth) [Figure 3]. If the resultant surgical defect is large then the height of step is small.

The third part has a medial curvature toward mid-palatal raphe and a lateral curvature toward teeth. The lateral curvature of the flap is 7 mm away from the palato-gingival margin of the maxillary teeth. This should avoid greater palatine nerve and blood vessels which is at a distance of approximately 10 mm [Figure 3].

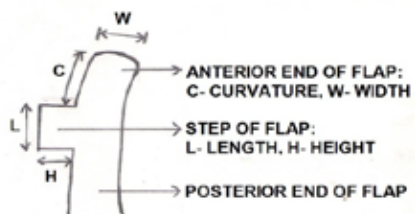


Figure 3- Parts of "Stepped Palatal Flap".

Full thickness incision is made up to the bone according to the planned incision. A full thickness stepped palatal flap is elevated and reflected. A suture may be passed through anterior margin of the flap for proper reflection. Bleeding from the terminal branches of the greater palatine vessels can be controlled with the help of pressure, electrocoagulation or suturing. Reflection of flap revealed greater palatine nerve and vessels at the point they emerges from the greater palatine foramen. With the help of surgical blade or dissecting scissor the vascular pedicle along with nerve is separated from the underlying flap. This should be done until the anterior limit of Stepped second part. The anterior most part of the flap with embedded vascular pedicle is cut at this point. This will create an anterior free palatal island pedicle formed by anterior part of the flap and posterior stepped mucosal flap formed by stepped and posterior end of flap together [Figure 4].

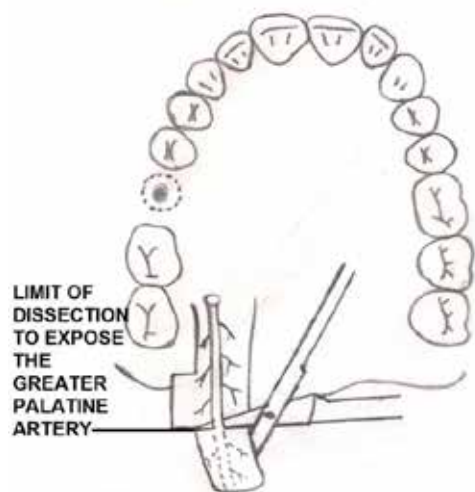


Figure 4- Reflection of Stepped Palatal Flap along with exposure of greater palatine vascular pedicle.

The anterior palatal island pedicle is inverted such that its epithelized surface will face maxillary antrum and the raw surface is toward oral cavity. This pedicle will cover the resultant surgical defect in relation to fistula and is sutured to its buccal margin after undermining. Suturing should be done with non- resorbable 3-0 black silk suture utilizing horizontal mattress technique reinforced with multiple interrupted sutures [Figure 5].

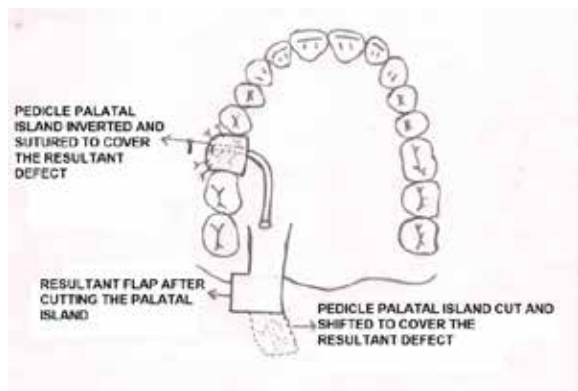


Figure 5- Anterior Palatal Island inverted and sutured to cover the OAF.

The posterior mucosal flap is repositioned and is advanced over the anterior palatal island. The two raw surfaces are facing each other and the epithelial surface of posterior mucosal flap is toward the oral cavity. The mucosal flap is held in place utilizing multiple interrupted sutures with palatal- island and with buccal margin. This will ensure double layer water tight closure of OAF [Figure 6].

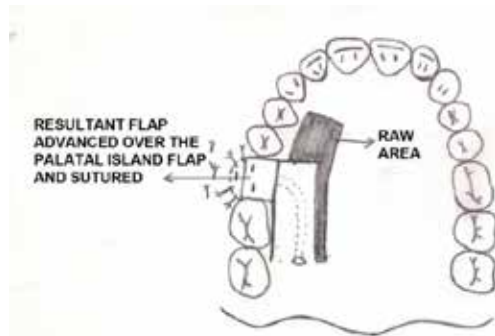


Figure 6- Stepped part of flap overlapped over the anterior palatal pedicle to provide double layer closure.

The raw surface left after this procedure can be covered with ribbon gauze impregnated with White's head varnish. The sutures should be removed after 10-14 days.

DISCUSSION

Oroantral communication (OAC) of less than 5 mm in diameter may heal by themselves [10]. However, in large OAC, surgical management is usually required. Various surgical techniques can be employed utilizing buccal, palatal or combined mucoperiosteal flaps [11].

Reharmann in 1936 firstly published a buccal advancement flap for closure of OAF. The main advantage of this technique is that it is a simple and efficient method. In 1939 Ashley firstly described a full thickness palatal flap for closure of OAF. All palatal flaps are based on greater palatine artery. Therefore, maintaining integrity of this vascular pedicle is important in maintaining the success of palatal flaps. The axial vascular supply, sufficient width and thickness enable the palatal flaps a better and safer method for closure of OAF [12].

The main advantage of the palatal flap is its relatively simple anatomy [13]. The palatal mucosa is tightly adherent to its underlying periosteum. This periosteum is attached to the hard palate by dense Sharpey's frirs. The palatal flap is a type of axial flap which is based on greater palatine artery [14]. This anatomy gives palatal flaps a great versatility for use during surgery. Another advantage is the ability of palatal flap to rotate 180 degrees [15].

The "Stepped Palatal Flap" after division has two parts. The free anterior palatal island is based on the greater palatine vascular pedicle. This can be inverted and mobilized to cover the OAC without strangulation of vascular pedicle. The Posterior part of the flap derives its blood supply from its posterior attachment with adjacent soft tissues supplied by lesser palatine vessels. The stepped portion of the flap overlaps with inverted palatal island to provide double layer closure of OAF. The Stepped part of the flap unites with raw surface of underlying palatal island and derives vascularity from palatal island.

The indication of "Stepped Palatal Flap" technique is to close OAF at first attempt or in relapsed cases at second attempt. This double layer closure is made possible with the help of stepped part of the flap. The dimension of the stepped portion decreases in cases of larger OAF. Therefore, this technique cannot be employed in case of large OAF.

The main advantage of this technique is that it provides double layer closure of OAF. The efficacy of thick palatal flap is well established in literature. This technique can be used to advantage in relapsed cases of OAF. Additionally, this technique can be employed with minimum and simple armamentarium available.

The main disadvantage of this technique is that it is a technique sensitive procedure and may require more time as compared to conventional methods of OAF closure.

CONFLICT OF INTEREST- NONE
SOURCE OF FUNDINNG- NIL
PATIENT CONSENT- NOT REQUIRED
ETHICAL APPROVAL- NOT REQUIRED

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