

Buccal fat of pad flap versus Sandwich combination flap for treatment of oroantral communication - A case series

¹Dr. Ruma Saha, Post Graduate Trainee, Dept of Oral & Maxillofacial Surgery, Haldia Institute of Dental Sciences & Research.

²Dr. Rajarshi Banerjee, BDS, MDS, MOMS Professor & Head of the Department, Dept of Oral & Maxillofacial Surgery, Haldia Institute of Dental Sciences & Research.

³Dr. Mayukh Misra, BDS, MDS, Professor, Dept of Oral & Maxillofacial Surgery, Haldia Institute of Dental Sciences & Research.

⁴Dr. Mainak Ghosh, Post Graduate Trainee, Dept of Oral & Maxillofacial Surgery, Haldia Institute of Dental Sciences & Research.

Corresponding Author: Dr. Ruma Saha, Post Graduate Trainee, Dept of Oral & Maxillofacial Surgery, Haldia Institute of Dental Sciences & Research.

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Abstract

Introduction: Oroantral communication is a common complication faced by every oral and maxillofacial surgeon. It is commonly seen on maxillary posterior region due to abnormal anatomy i.e., close maxillary sinus floor to oral cavity or due to iatrogenic causes like maxillary premolar or molar extraction and implant placement. Small communication of less than 2cm can heal spontaneously but initial care and attention is very much important. Delayed intervention will produce maxillary sinusitis and patient discomfort and development of oro antral fistula. This case series highlights two types of flaps that can be effectively used for closure of Oro antral communication (OAC) cases

Keywords: Management, Oroantral, Closure, Communication, Fistula, Buccal Fat, Buccal Fat Pad.

Introduction

Oro-antral communication /fistula is an unnatural communication between the oral cavity and the maxillary sinus¹. It is a common complication faced by every oral and maxillofacial surgeon. These complications occur most commonly during extraction of upper molar and premolar teeth due to abnormal anatomic proximity of maxillary sinus floor to oral cavity or projection of the roots within the maxillary sinus. Another common cause of oro-antral communication is observed during implant placement on posterior maxillary premolars and molar region². Other

causes of OAC include tuberosity fracture, dentoalveolar/periapical infections of molars, trauma etc³. Oroantral communication though is a common reconstructive operation to a surgeon yet is challenging and rewarding too. Untreated larger defects cause, development of acute sinusitis and most annoying complication like leakage of liquid through nostril of affected side during drinking. So, closure of the communication is very important step to prevent dislodgment of food and saliva to maxillary sinus, impaired healing and chronic sinusitis⁴ In case of small communication, OAC can be healed naturally. Only sinus regime is prescribed to prevent sinusitis. For larger defect surgical intervention is needed along with medicine⁵. There are multiple techniques which are being practised for last 50 years⁶ Surgical closure mainly done by autogenic soft tissue and bone grafts; allograft, xenograft, synthetic materials. Autogenous bone graft and xenografts are also important for correction of oroantral communication⁷

Among them we have chosen two techniques- Group 1- OAC repair by buccal fat and Group 2-OAC repair by buccal fat overlapped by buccal flap (combination flap).

Case series

08 patients reporting with of Oro-antral communication were included in this double-blind randomized clinical trial study. All the patients were chosen from the Outpatient Department of Oral and Maxillofacial Surgery of HIDSAR, Haldia. After completing a consent form, the patients were randomly divided into two groups. In group I, oro-antral communication was treated with buccal pad of fat flap and in group II sandwich flap (i.e., buccal advancement flap along with buccal pad of fat) was used. Size of the bone defect (OAC) was measured preoperatively Bucco palatally and mesiodistally. The larger value of the two groups was

used in our study. The patients were reviewed at 48 h, 1 week and at 1 month postoperatively for assessment of following:

- A. Closure of OAC
- B. Pain
- C. Swelling
- D. Restriction of mouth opening
- E. Loss of vestibular depth.

Inclusion Criteria

- 1. Patients were selected between 18 to 70 years of age
- 2. Patients with OAC without sinus infection were selected only
- 3. Patients were chosen without any significant medical disease that may compromise healing

Exclusion Criteria

- 1. Patients with sinus infections were excluded from our study
- 2. Patients having preexisting medical conditions that could influence the wound healing were excluded from this study.
- 3. Patients who need Caldwell-Luc procedure were excluded from the study.
- 4. Mentally challenged or uncooperative patients were excluded from this study.

Surgical Procedure

All the operations were performed under local anesthesia which was achieved by anesthetising posterior superior alveolar nerve, middle superior alveolar nerve, greater palatine nerve with 2% lignocaine with 1:80,000 adrenaline. All patients of Groups I and II were treated by same surgeon. Preoperatively patients were given chlorohexidine mouthwash 0.2% for mouth rinsing, before giving local anesthesia. The flap design of choice was either buccal fat of pad flap or combined flap.

Incisions were given with BP blade No. 15. Width of the margins of the flap was planned as per the width of the

defect so that it was wide enough to rest on bone when advanced to cover the osseous defect. In case of BFP flap – after infiltrating local anesthesia, circular incisions with 3 mm margins were made around OAC and epithelial tract and any inflammatory tissue within the opening were completely excised. Two divergent cuts were then made from each end of circular incision extending into the vestibule. The trapezoidal buccal mucoperiosteal flap was then reflected from the alveolar process and the lateral wall of maxilla. The pedicled BFP flap was exposed through 1 cm long vertical incision in the reflected periosteum posterior to zygomatic buttress. Pedicled BFP flap gently teased out by blunt dissection with the artery forceps and gently advanced into bony defect and secured to palatal mucosa. In case of combination flap, incision was given to release up to the depth of buccal vestibule; periosteum was incised on the deep surface of the flap to allow advancement of soft tissue to cover osseous defect without tension. After flap reflection, smoothing of bone margins, irrigation of socket with normal saline was done. Then as previously described first BFP was exposed and advanced towards bony defect. After that the elevated buccal mucoperiosteal flap along with BFP was sutured with palatal mucosa in its original position. All the sutures were given with 3-0 Mer silk suture with round body needle.

All patients were reviewed on 2nd day, 7th day and at 1 month postoperatively. The patients were instructed to eat soft meals for 10 days and to protect the repaired area. Patients were advised to sneeze with mouth open to avoid traumatizing the wound from air pressure in sinus area. Same medications were given postoperatively after closure of OACs in both groups.

- Capsule amoxicillin 500 mg with clavulanic acid 125 mg 8 hourly for 7 days

- Tablet ibuprofen 400 mg and paracetamol 500 mg 12 hourly for 5 days
- Otrivin nasal drop for 7 days.

Post-operative Assessment

Pain

Post-operative pain was measured by patients rating 12 h after surgery using a visual analogue scale (VAS) of 10 units on a three-point scale with 0-4 as mild pain, 5-8 as moderate pain, 9 -10 as severe pain⁸.

Swelling

According to the technique used by Chukwunke et al., post-operative swelling was evaluated by multiplication of two measurements⁹. Tragus-commissure and lateral canthus-gonial angle lines and compared with preoperative values at 48 h and 1 week and 1 month postoperatively using the following formula:

$$\text{Swelling} = (\text{Postoperative value} - \text{Preoperative value}) / \text{Preoperative value} \times 100 \%$$

Mouth opening

Maximum mouth opening (MMO) was evaluated by measuring the interincisal distance or the distance between the two alveolar ridges in edentulous patients preoperatively (MMO1) and comparing it with measurements at 48 h, 1 week and 1 month postoperatively (MMO2)¹⁰.

Duration

The duration of the procedure was measured from the beginning of incision till the last suture being used.

Vestibular depth

Vestibular depth was measured from free gingival margin adjacent to OAC to the mucobuccal fold.

Results

This prospective, randomized clinical study was conducted at the Department of Oral and Maxillofacial Surgery between January 2020 and February 2022 and consisted of 20 healthy patients with OAC. A total of 20

patients were included in this study where they were divided into two groups, with each comprising 10 patients. 10 patients were treated with buccal pad of fat flap (Group I) and 10 with combination flap (Group II). All the fistulas were closed at the 1-month follow up; tested by nose blowing. This indicates that both of methods are equally successful for closure of oro-antral communication.

The mean value of pain was higher and statistically significant at the 2nd and 7th post-operative days in Group II ($P < 0.05$) and nil at 1 month after surgery in both the groups. In both groups a significant increase in oedema was observed after surgery for all the measurements. Swelling was significantly higher in Group I on day 2 and on day 7 ($P < 0.05$). At 1 month, there was no significant difference in swelling in either group ($P > 0.05$). Mouth opening was less in group I on day 2 and on day 7 which was statistically significant ($P < 0.05$). However, at 1 month postoperatively, there was no significant difference between the two groups ($P > 0.05$). Time duration of surgery was higher in Group II and it was statistically significant also ($P < 0.05$). Pre-operative vestibular depth was statistically insignificant ($P > 0.05$).

Discussion

An oroantral communication can develop as a sequel of dental extractions, infection, maxillary cyst/tumor excision etc.^{11,12} An oroantral communication < 3 mm can close spontaneously, but large one > 5 mm need more complicated surgical management.^{13,14,15} It is shown that about 50% of patients with unattended oroantral communication will develop maxillary sinus symptoms in 48 hours, and within 2 weeks, 90% will have maxillary sinusitis. Early detection and management are advised to avoid further complications.¹⁶

Buccal fat pad also known as Bichat's fat pad, one of the deeply located fat pad in oro-facial region between buccinator muscle and several superficial muscles like masseter, zygomaticus major etc.¹⁷

Anatomically, it has three lobes- anterior, intermediate and posterior, one main body with four extensions- buccal, pterygoid and deep temporal and superficial.

Functionally, in infants helps in suckling. Also acts as gliding pad for muscles of mastication and protective barrier to deep muscles from external forces.⁸⁻¹⁰. Main two arteries that nourishes buccal fat pad are posterior superior alveolar artery superiorly and buccinator artery inferiorly.

Buccal fat pad is associated with different important structures- Different studies have showed that stenson's duct passes either laterally or through the body.¹¹⁻¹². Buccal branch/branches of facial nerve lies on the anterior lobe and it also packs mandibular neurovascular bundle and lingual nerve in the pterygomandibular space.¹³⁻¹⁴

Numerous clinical implications have been documented regarding buccal fat pad.

-Several authors have suggested a good result from facelift procedure.

-Buccal fat pad has also been effective in reconstructing intraoral defects and also an alternative in failed locoregional flaps (Defect size < 5 cm).

-Removal of buccal fat pad has also been done reduce cheek prominence.

The buccal advancement flap was performed due to the effortlessness of the strategy and the presence of the appropriate sign. The buccal advancement flap designed by Rehrmann is considered as most well-known careful procedure.¹⁵⁻¹⁶

This flap is created by making two buccal different vertical incisions stretching out into the buccal vestibule

from the extraction attachment or from fistula hole edges if there should arise an occurrence of OAC. The trapezoidal buccal flap is raised and brought across the imperfection and stitched to the palatal edges of the deformity.¹⁷

Issues that we can run over predominantly at the hour of collecting BFP are hole or shrinkage. Egyedi advocated covering the fat cushion with split skin join to survive these issues; however, Tide man et al. have shown that BFP was equipped for self-epithelialization inside 3 a month of its inset.¹⁸⁻¹⁹

Covering the BFP may be fundamental in instances of huge deformities and where how much BFP might be insufficient. In such cases, buccal advancement flap is the most ideal choice. This mix procedure gives greater strength and gives extra tissue to cover.

Conclusion

Repair of oroantral communication is essential to prevent further complications related to the maxillary sinus and adjacent structures. It is significant that the utilization of BFP with buccal advancement flap (combination method/sandwich technique)²⁰⁻²¹ gives greater dependability, can be utilized to cover BFP and as extra tissue where there is an inadequate BFP. It can likewise be utilized in situations where a trapezoidal fold is raised for certain, reasons, cases with hole and shrinkage of BFP²².

Figures





Fig1: oroantral communication closed by combination flap.



Fig 2: oroantral communication closed by buccal fat pad flap

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