

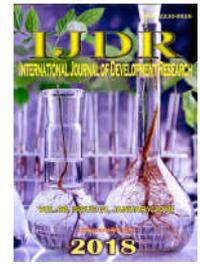


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CASE STUDY

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ORO-ANTRAL COMMUNICATION AND ORO-ANTRAL FISTULA: A BRIEF REVIEW AND REPORT OF TWO CASES

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ABSTRACT

Oro-antral communication and fistulas are commonly encountered complications in upper premolar and molar regions. A total of 307 articles were screened after conducting a literature search on Pubmed, of which 41 were selected and reviewed. Various treatment modalities used for the correction of OAC/OAF were evaluated for their effectiveness and long term results. We concluded that the treatment modality is dependent on many factors and should be used judiciously whenever required. Through this paper, we present the above review and report of two cases, managed at our department.

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INTRODUCTION

Oro-antral communications and fistulas are complications frequently encountered by Oral and Maxillofacial surgeons. Oro-antral communication is an unnatural communication between the oral cavity and the maxillary sinus (Andrea Enrico Borgonovo, 2012). These complications occur most commonly during extraction of upper molar and premolar teeth. The major reason is the anatomic proximity or projection of the roots within the maxillary sinus (Orhan Guven, 1998). In the absence of any infection of maxillary sinus the defects which are smaller than 2mm can heal spontaneously following blood clot formation and secondary healing (Klara Sokler, 2002; Andrea Enrico Borgonovo, 2012).

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However, closure of larger defects is extremely important since they can lead to infection, impaired healing and chronic sinusitis and OAF. It is advisable to operate and achieve closure of oro-antral communication within 24 hours (Pulkit Khandelwa, 2017). Oro-antral fistula is an epithelialized pathological unnatural communication between oral cavity and maxillary sinus (Pulkit Khandelwa, 2017). It develops when oro-antral communication fails to close, and gets epithelialized. The epithelialization usually occurs when the perforation persists for at least 48-72 hours (Pulkit Khandelwa, 2017). In the management of surgical closure of oro-antral communications and oro-antral fistulas, several methods of surgical repair have been described. The choice of these procedures is influenced not only by the amount and condition of the tissue available for repair but also by the size and location of the defect. The aim of this article is to evaluate the

clinical effectiveness of various surgical techniques used for the closure of OAC's /OAF's along with a review of their advantages and disadvantages and brief report of two cases that reported to our department.

CASE REPORT – 1

A 34 year old male patient reported to the department of Oral and Maxillofacial surgery for extraction of 16 due to its non-restorable nature. Extraction was performed with due precautions, taking into consideration the radiographic proximity of the roots to the maxillary sinus. The patient was asymptomatic in the immediate post-operative period. However, he reported back 2 days following extraction with the complaint of discharge through the nose on drinking water and rinsing. Following the nose blow test, Valsalva manoeuvre and radiograph a diagnosis of oro-antral communication was established. Routine investigations were carried out and closure of oro-antral communication was planned using buccal advancement flap.

SURGICAL TECHNIQUE

The procedure was carried out under local anaesthesia. Following complete aseptic protocol, buccal crestal incision with two vertical releasing incisions were taken from mesial and distal aspect of 16 region. Trapezoidal flap was raised and periosteum was scored to achieve adequate mobility of the flap (Fig 1.1).

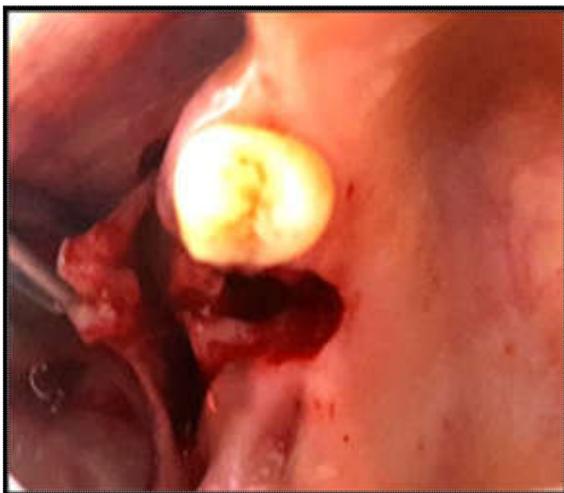


Fig. 1.1. Raised trapezoidal buccal flap

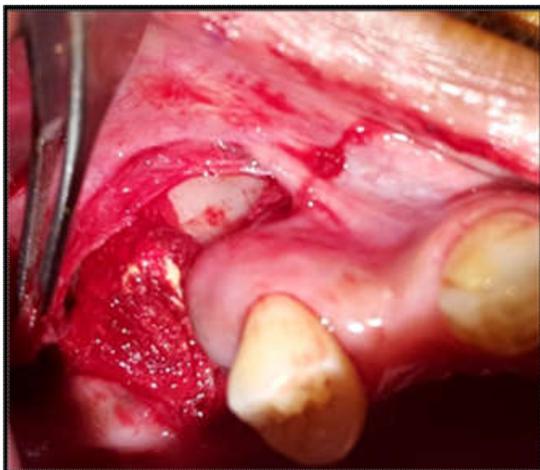


Fig. 1.2. Bony cavity packed with gelfoam

The socket was curetted and debrided. OAC was identified and measured to be approx. 3 mm in diameter. The bony cavity was packed with gelfoam (Fig 1.2) and complete closure with the buccal flap was achieved using 3-0 Vicryl mattress sutures (Fig 1.3). Regular follow ups revealed satisfactory healing which was assessed clinically and radio graphically. Patient had no sinus related complaints on repeated follow-ups which were extended to a period of 6months.



Fig. 1.3 – Closure of the defect

CASE REPORT- 2

A 45 year old female patient reported to the department of Oral and Maxillofacial surgery complaining of excruciating pain in her right maxillary posterior region. She gave a history of extractions with 16 and 17 at some institute.

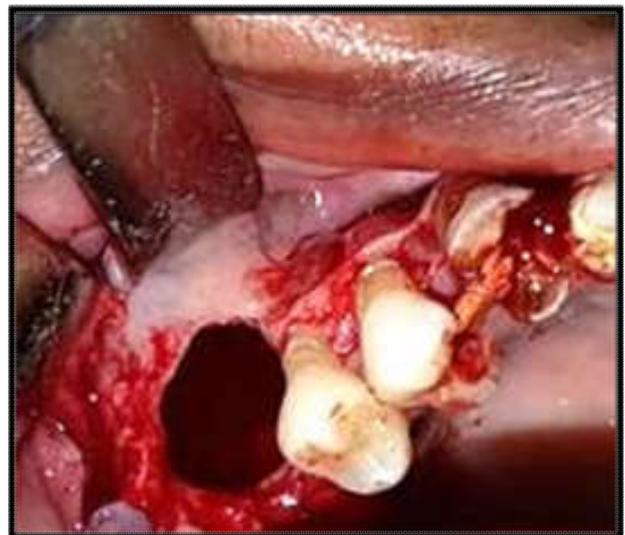


Fig. 2.1 – Defect after fistulous tract excision

The reports from the previous institute revealed a history of oro-antral fistula and closure of the same using buccal fat pad. However, the symptoms did not subside and she continued to complain of pain and discharge through the nose, even after the procedure. On clinical examination, a dehiscant flap with an ovoid defect, approximately 9 X 7mm and inflamed margins was noted. After performing routine investigations, a surgical closure using a combination of buccal and palatal flap was planned.



Fig. 2.2 – Raised palatal flap



Fig. 2.3 – Closure of the defect



Fig. 2.4 – Follow up with satisfactory healing

SURGICAL TECHNIQUE

The procedure was carried out under LA+ sedation following routine sterilization protocol. The surgical site was anesthetized using PSA nerve block and greater palatine nerve block. The fistulous tract was excised using no.11 blade (Fig 2.1). The area was thoroughly curetted to remove all unhealthy granulation tissue. A piece of *set alginate* was accidentally found and removed from the maxillary sinus. Full thickness palatal island flap was taken based on greater palatine vessels (Fig 2.2). Care was taken to avoid any injury to the greater palatine neurovascular bundle. The palatal flap was rotated laterally. The anterior extension and dimensions of flap were kept sufficient to allow its lateral rotation and tension free closure of the defect using 3-0 vicryl mattress sutures was achieved (Fig 2.3). Satisfactory healing was noted on regular follow-ups and no complaints and/or recurrence was noted (Fig 2.4).

REVIEW OF LITERATURE

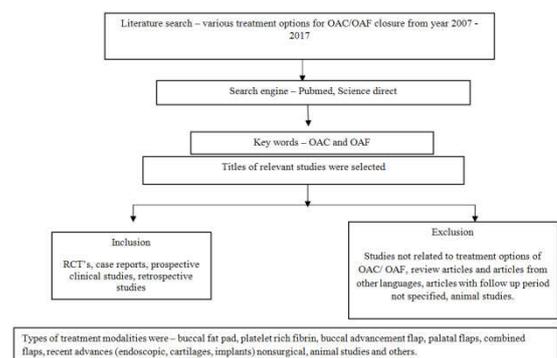
The PRISMA protocol was followed for the review. Search engines and medical databases like Pubmed were tapped for information related to the subject. The search words “oro-antral fistula” and “oro-antral communications” were employed for retrieval of data. An analysis of the treatment modalities, the reason for the selection of a particular modality, and the follow up periods including the proclaimed success rates was done. A total of 307 articles were found after doing a literature search on Pubmed. Out of 307 articles, 41 articles were included in the study based on the inclusion criteria. 266 articles were excluded from the study depending on the exclusion criteria.

Table 1. Various treatment modalities for OAC/OAF

Treatment option	No. of articles
Buccal fat pad	9
Platelet rich fibrin	2
Local flaps	4
Combined flaps	5
Recent advances	
Cartilage / graft	6
Implant	
Endoscope	5
Cyanoacrylate	1
Polyurethane foam	1
PGLA coated roots	1
Non-surgical	2
Others (bisphosphates , implants, auto transplant)	5

MATERIALS AND METHODS

Table 2. Prisma protocol for inclusion of articles



DISCUSSION

BUCCAL FAT PAD: Buccal fat pad for the closure of oro-antral communication and oro-antral fistula is routinely performed. There are 9 articles in the support of the buccal fat pad as a technique for closure of intra oral defects. Daif *et al* has stated long term effectiveness of BFP in the closure of large OAF by doing a prospective study on 25 patients > 5mm defects, concluding it as durable, straight forward, convenient and reliable method for treatment of large OAF (Daif, 2016). Jain MK *et al* did a study on 15 patients with BFP and proved it is effective and reliable with follow up of 3 months (Jain, 2012). Prashanth *et al* concluded that use of BFP is a simple, convenient and reliable method for closure of small to medium sized intra oral defects with follow up of 3 months (Prashanth, 2013). However, 2 articles have also mentioned post-operative complications like necrosis of flap and secondary fistula formation (Castellani, 2015). Poeschi *et al* did a study on 161 patients with 6 month follow up giving overall success rate of 98% in which 12 patients had insufficient closure with follow up of 6 months (Poeschl, 2009).

PLATELET RICH FIBRIN: Assad *et al* reported two cases of closure of OAC with PRF which gave successful results with 8 weeks follow up period (Assad, 2017). DePoi R *et al* also reported a case in which oro-antral fistula developed following sinus elevation surgery was managed successfully using PRP⁸

COMBINED FLAPS: Merlini *et al* also reported a case of buccal advancement + palatal advancement which completely resolved, with full remission of fistula (Merlini, 2016). Sayyed AA *et al* suggested double layered closure of chronic OAF is straight forward, convenient, and successful technique that provides stable, strong, and double layered closure of OAF (Sayed, 2015). Weinstock *et al* proposed composite three layered closure of OAC with 10 months follow up using BFP + Buccal advancement + Bone graft which allows stability and benefit of bone grafting (Robert, 2014). Candamounly *et al* did a double layered closure of OAF using BFP and buccal advancement flap (Candamourty, 2012).

RECENT ADVANCES

Kapustaki *et al* has done a case study on 20 patients in which autogenous bone graft and PRF was used with average increase in height 1.5mm to prepare alveolus for implant and prosthetic solution. Ozkan *et al* has given alternative surgical management of OAF using auricular cartilage and to provide a solid alveolar bone site for pre-implant surgery. Ram H *et al* did a prospective clinical study on 20 patients by using auricular cartilage proving it effective sealing material in OAF closure defect size ≤ 10 mm (Adams, 2015). Horowitz *et al* have reported a case series of 28 males and 7 females in which they performed one stage combined endoscopic and per-oral buccal fat pad approach for large oro-antral fistula closure that is complicated with chronic maxillary sinusitis. Follow up of 7- 21 months revealed successful results (Gilad Horowitz, 2016). Adams *et al* also use a combined approach of functional endoscopic sinus surgery and buccal advancement or buccal fat pad graft on 43 patients which resulted in very successful and predictable outcome (Adams, 2015).

FLAPS

Ribeiro FS *et al* also reported a case of treatment of OAC using the lateral palatal sliding flap technique proving an

efficient technique for closure of OAC (Fernando Salimon Ribeiro, 2015). Pourdanesh F *et al* used an alternative approach for closure of OAC using coronoid process pedicled on temporal is muscle flap (Fereydoun Pourdanesh, 2013). Visscher *et al* did a retrospective study on 308 patients amongst them 70% were treated with buccal advancement flap and gave successful results. However, 28 patients needed a secondary intervention and 3rd intervention in 4 patients (Visscher, 2011).

OTHERS

Procacci P *et al* did a clinical study on 12 patients with functional endoscopic sinus surgery and titanium mesh to close OAC. Titanium mesh is advantageous because of its predictable healing, mechanical scaffold, tissue stability and possible oral rehabilitation (Procacci, 2016). Nagori SA *et al* have reported a case in which closure of oro-antral communication was closed by autotransplantation of third molar which showed good clinical results with 18 month follow up (Shakil Ahmed Nagori, 2015). Ahmed *et al* also reported a case in which closure of oro-antral fistula was done using titanium plate and transalveolar wiring which showed successful results (Wael Mohamed, 2015). In the 1st case, we used buccal advancement flap, as the defect was small about 3mm and patient reported within 24 hours of extraction and there were no obvious signs of infection. Buccal advancement flap was easy to raise in 16 region and achieved good closure of the defect. Prosthetic rehabilitation was possible since vestibular depth was not compromised. In the 2nd case, since a secondary intervention was required for closure of the defect because of failure of BFP in primary intervention. The defect was more than 7mm in diameter and had reduced vestibular depth due to primary intervention. So we opted for buccal advancement along with palatal rotational flap to achieve tension-free closure, to preserve a reasonable amount of vestibular depth stability and strength of the flap.

Conclusion

To conclude, depending upon the size and site of the defect, availability of the flap, time interval between the occurrence of the communication/fistula and surgical closure, previous surgical intervention undertaken, presence of pre-existing infection, the treatment modality is planned. Also, in cases of failure of primary intervention a combined flap using buccal advancement and palatal rotational flap should be preferred since it is reliable, stable and effective to achieve better prognosis in long standing OAF.

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