

Surgical management of oro - antral fistula due to dental procedures: two case reportsKAO Ayekinam^{1*}, Chbicheb Saliha², El Wady Wafaa³¹Resident in the department of oral surgery, Dental Center of Treatment and Diagnosis (Ibn Sina Hospital), Rabat, Morocco²Professor of oral surgery, Faculty of Dentistry of Rabat, Mohammed V University, Morocco³Professor and chief of the division of oral surgery service, Faculty of Dentistry of Rabat, Mohammed V University, Morocco

Received: 26-08-2018 / Revised: 15-10-2018 / Accepted: 13-11-2018

Abstract

Oro-antral fistula is one of the most frequently encountered complications after tooth extractions in the posterior maxillary. It can also be a complication following an infection involving the maxillary teeth, invasion of the sinus cavity by a cyst or carcinoma, trauma, the Caldwell-Luc operation, or implant procedures. Oro-antral fistula is an epithelised tract linking the maxillary sinus to the oral cavity if the oro-antral communication is not treated or in case of failure. Many surgical techniques have been proposed for the closure of the oro-antral fistula and the factors that should be considered for choice of each technique depend on the size of the communication, its location, time of diagnosis and health of the maxillary sinus. In order to avoid any sinus complication, the oro-antral fistula must be quickly closed.

Key Words: oro-antral fistula, Buccal fat pad flap, buccal flap.**Introduction**

Oro-antral communication is a pathological conditions characterised by the existence of an unnatural opening between the maxillary sinus and the oral cavity. Oro-antral fistula is an epithelised tract linking the maxillary sinus to the oral cavity if the oro-antral communication is not treated. They occur most commonly after the extraction of maxillary posterior teeth because of the close proximity between their roots and the maxillary sinus floor.[1,2] According to Gacic et al studies, 2009, its frequency ranges between 0.31% and 4.7% following the extraction of upper teeth. [2]

Tuberosity fracture, dentoalveolar/periapical infections of molars, implant dislodgement into maxillary sinus, trauma, cysts and tumors enucleation, osteoradionecrosis, flap necrosis, le Fort I osteotomy in orthognathic, osteomyelitis, dehiscence following implant failure and sometimes as a complication of the Caldwell-Luc procedure or pathological lesions of the maxillary sinus, are also found as other etiological factors described in the literature. [1,3] It is very important to close this communication in order to prevent sinus contamination which may lead to infection, impaired healing and chronic sinusitis.[1]In the literature, a multitude of surgical techniques has been described for this communication closure, but the most used are the buccal flap, the palatal rotation flap and the buccal fat pad flap. [2-7] The purpose of this work is to describe two successful management of oroantral fistula by using buccal fat pad flap and buccal flap.

Case report

Case 1: A 28-year-old female patient, in good general health, referred to our Oral Surgery Department of the Consultation Center of Dental Treatment (CCDT) of Rabat, with a small oroantral fistula in the left molar area in the maxilla. There were no clinical signs of a

Correspondence*Dr. KAO Ayekinam**

Resident in the department of oral surgery, Dental Center of Treatment and Diagnosis (Ibn Sina Hospital), Rabat, Morocco.

E-Mail : kabibine@yahoo.fr

sinus condition. She was complaining about leakage of air through the communication after tooth extraction in the area. Clinical examination revealed an approximately 1mm fistula surrounded with normal tissues (fig1). The Valsalva maneuver shows air hissing from the fistula into the mouth. Dental radiography with gutta percha cone confirmed the communication between the oral cavity and the left maxillary sinus (fig2); the blandeau scan revealed no presence of sinus infection. The patient was then prepared for chirurgical closure of the fistula by using buccal flap technique. After local anesthesia, incision around the fistula subsequently was performed with n°15 scalpel blade. In order to obtain a vestibular flap two vertical incisions were made, from each side towards the buccal sulcus (fig3). The base of the flap was wider to enable a better supply of blood to the flap. The maxillary sinus was cleaned with a 9% saline solution. The buccal flap was dragged into the fistula site so that the latter was completely covered, then sutured with simple 4-0 silk thread stitches, without tension (fig4). The patient was followed up for a year without recurrence (fig5).

Case 2: A 32-year-old male patient, was referred to our Oral Surgery Department, complaining of pain on the left hemiface, liquid outflow through his nose and food inflow through the communication after a superior left second molar extraction. The clinical intra-oral examination, showed an approximately 1cm opening on the superior second molar, with no pus or systemic inflammatory signs (fig6). The blandeau scan revealed no presence of chronic sinus infection. According to the patient, he had been taken in charge by another dentist for closing the fistula a month ago. The surgical management of the fistula by using buccal fat pad technique was proposed after a complete management of the sinus symptoms. After local anesthesia, a circular incision with a 3-mm margin was made around the defect, the epithelial tract with any inflammatory tissue was completely excised, and two vertical incisions extended into the vestibule were made. The trapezoidal buccal mucoperiosteal flap was reflected and the lateral wall of the maxilla was exposed. Buccal fat was exposed with a vertical incision through the periosteum posterior to the zygomatic buttress. The buccal fat pad was dragged into the fistula site completely covering the defect, then sutured by absorbable polydioxanone sutures, without tension (fig7). The mucoperiosteal flap was replaced in its original position and sutured by non absorbable polydioxanone sutures (fig8). Six weeks after the surgery, we noticed a complete epithelialization of the

buccal fat. The patient was followed up for a year without recurrence (fig9).

Discussion

An oro-antral fistula is an epithelialized pathological unnatural communication between oral cavity and maxillary sinus, when the oro-antral communication fails to close spontaneously.

According to many authors, the epithelialization occurs after 48-72 hours of evolution and the closure of this communication must be quick to prevent the possibility of inflammation of the sinus by infection from the oral cavity. [1,4,7] the sinus infection is caused by the passage of anaerobic bacteria from the oroantral communication created between the sinus mucosa and the apex of the non-vital tooth. [4] The oro-antral communication occurs most commonly during extraction of upper molar and premolar teeth because of the close proximity between their roots and the maxillary sinus floor as in our cases. [1,2,3,4,6,7] According to Jain et al dental extraction (73,3%) followed by maxillofacial pathology was the most common causes for developing oro-antral fistula. [8] these posterior roots are separated from the sinus by a thin bony lamella and its mucous membrane, or very rarely only by the mucous membrane. [4,7] It has been reported that the perforation of the Schneiderian membrane increased risk of maxillary sinusitis. [4] A meta-analysis made by Franco-Carro (2011), revealed that oro-antral communication occurs slightly more often in men and during the fourth decade of life. [7] The risk of oro-antral communication is very low in children because of the smaller volume of the sinus. [7] Clinically, a large fistula is easily seen on oral examination. [1] and sometimes with the development of an antral polyp through the fistula [2]

The Valsalva maneuver can help in the diagnosis of small defect: When the nostrils are closed with the fingers and the patient is asked to blow through the nose with the mouth open, air hisses from the fistula into the mouth. [1,4]. Sometimes, air bubbles, blood or mucoid secretion can also be seen as around the orifice. [1]

The patient with an oro-antral fistula can complain about some symptoms such as: postnasal drip accompanied by unpleasant taste, nocturnal cough, hoarseness of voice, ear ache or catarrhal deafness; persistent mucopurulent, foul, unilateral nasal discharge from the affected nostril especially when head is lowered. [2]

Computed tomography can be done to rule out the presence of maxillary sinusitis, or analyze the size and the location of bone defect. [1,3,4].

The main goal in the management of oro-antral communication or oro-antral fistula is the quick closure of the defect in order to avoid the sinus complications. This management depend on the size of the communication, time of diagnosis and health of the maxillary sinus.[2] According to some authors , a small oro-antral communication (<5mm) can heal spontaneously by suturing the gingiva, immediately after tooth extraction but other ones regard the surgical management always indicated. When its diameter is larger, surgical techniques are used. [1,2 ,4, 6, 7] In the literature, multiple surgical techniques have been described for the treatment of oro-antral communication or oro-antral fistula and the most used are the buccal flap, the palatal rotation flap and the Bichat's fat pad graft. Successful closure should be preceded by the complete elimination of any sinus pathology, the fistulous tract, degenerated mucosa and diseased bone in order to avoid recurrence.[1,4,7]

Buccal flap was first published by Rehrmann in 1936, as a simple method for closing an oroantral fistula and since then it has been used a lot by many authors.[4] It is used when the defect size is small or medium (< 1 cm). [1] In our case the size of the defect was medium. This technique offers good results, but its use is limited when the defect is located in the palatine area.[4] Its major disadvantage is loss of the vestibular depth, but according to Rehrmann, Eneroth and Martensson, it is temporary and disappears after 8 weeks. [1,7] A study of Killey and Kay in 1975 reported success with this method in 93% of cases .[4]

The buccal fat pad flap is another common buccal approach for closing an oroantral fistula. Since it was first reported in 1977 by Egyedi, as a pedicled flap to repair oral defects, this flap has been used successfully for closure of oroantral fistula of varied sizes and locations [4, 5,9]. In our case we used this technique because the patient had been taken in charge by another dentist for closing the fistula a month ago by using buccal flap. According to some authors, its excellent blood supply may explain the high success rate with this flap in various clinical situations. [8] Most published studies, reported a complete epithelialization period of 4-6 weeks, when the buccal fat pad is

exposed to the oral environment,[5,7,8,9,] This is in agreement with our case .

Despite the advantage of this technique , some postoperative complications such as trismus , haematoma and swelling, infection, partial necrosis, massive haemorrhage, limitation of mouth opening, excessive scarring and facial nerve injury have been reported [5] .

In our case , the buccal fat pad was covered by the buccal flap in order to reduce the chances of breakdown of wound and recurrence of the defect. The combination of two flap technique for the closure of oro-antral fistula was described by some authors in the literature and offered good results.[1]

Palatal rotation flap , because of its good blood irrigation by the major palatal artery have also been used in the management of oro antral fistula by many authors ,since it was first reported by Ashley, in 1939.[7] However, it has been reported that this technique is painful for the patient.[7] Other disadvantages are the flap necrosis and exposure of the bone surface .[1] The Meta-analytic study of Borja et al in 2011 concluded that it is the technique in which the greatest number of complications is reported.[7]

Apart from the use of soft tissue flaps , other surgical techniques by using autogenous grafts, Xenografts, Allogeneous grafts are also described.[2] The use of Bone autografts such as the iliac crest is recommended for large defects.[1]

Postoperatives instructions are important in order to avoid complication and depend on The strict cooperation of the patient. The use of systemic antibiotics is recommended to reduce the risk of sinus or flap infection.[1]

Conclusion

According to the literature , the extraction of upper molar and premolar teeth was the most common causes for developing oro-antral fistula and any surgery in this area should be atraumatic in order to avoid complications

It is important to notice that the failure of chirurgical management of oro-antral fistula depends on the inadequate preoperative management of sinus infections , excessive tension on the flap, and negligence of post-operative instructions . It has been reported that the higher risk of recurrent is in the presence of maxillary sinusitis.



Fig 1: Intraoral view showing the localization of the fistula



Fig 2: Dental radiography with gutta percha cone confirming the communication between the oral cavity and the left maxillary sinus



Fig 3: Intraoral view showing the localization of the fistula after the elevation of the flap.



Fig 4: The buccal flap sutured with the palatal mucosa



Fig 5: postoperative view of the area after a year follow-up



Fig 6: Intraoral view showing approximately 1 cm opening on the superior second molar



Fig 7: Intraoral view showing the buccal fat pad sutured with the palatal mucosa by 4-0 silk absorbable polydioxanone suture



Fig 8: mucoperiosteal flap placed over the buccal fat pad and sutured by non absorbable polydioxanone sutures



Fig 9: postoperative view of the area Six weeks after the surgery

Reference

1. Khandelwal P, Hajira N. Management of oro-antral communication and fistula: various surgical options. *World J Plast Surg* 2017; 6(1):3-8.

2. Kiran Kumar Krishanappa S, et al., Interventions for treating oro-antral communications and fistulae due to dental procedures. Cochrane Database of Systematic Reviews 2016.
3. De Souza Lopes PH, et al . Combined palatal flap and titanium mesh for oroantral fistula closure. *Ann Maxillofac Surg* 2015; 5: 89-92.
4. F. Carini et al. Odontogenic maxillary sinusitis with oro-nasal fistula: a case report *Annali di Stomatologia* 2014; 2 (2): 37-39.
5. Nezafati S., Vafaii A., Ghojzadeh M. Comparison of pedicled buccal fat pad flap with buccal flap for closure of oro-antral communication. *Int. J. Oral Maxillofac. Surg.* 2012; 41: 624–628.
6. De Biasi et al. The effectiveness of surgical management of oroantral communications: A systematic review of the literature. *Eur J Oral Implantol* 2014; 7(4):347–357.
7. Franco-Carro, B et al. Meta-analytic study on the frequency and treatment
8. of oral antral communications. *Med Oral Patol Oral Cir Bucal* 2011; 16(5):682-7.
9. M. K. Jain, C. Ramesh, K. Sankar, K. T. Lokesh Babu. Pedicled buccal fat pad in the management of oroantral fistula: a clinical study of 15 cases. *Int. J. Oral Maxillofac. Surg.* 2012; 41: 1025–1029.
10. Kim MK et al. The use of the buccal fat pad flap for oral reconstruction *Maxillofac Plast Reconstr Surg.* 2017; 39(1):5.

Conflict of Interest: None

Source of Support: Nil