Buccal fat pad flap in management of oroantral fistula: A retrospective study

Ahmad Al Nashar, Hekmat Yakoob

ABSTRACT

Background: The oroantral fistula is a pathological communication between the maxillary sinus and oral cavity lined by epithelium. Aims and Objectives: To evaluate the use of pedicled buccal fat pad graft in the closure of oroantral fistula. Materials and Methods: A retrospective study was conducted on patients with oroantral fistulae treated by pedicled buccal fat pad graft from 2011 to 2014. Data collected includes patient age and gender, etiology of fistula, location of fistula, interval from appearance of fistula to repair, and immediate and late complications and Follow-up evaluations. Results: All 16 cases of the oroantral fistulae were successfully treated with this technique. Though partial necrosis of the flap was observed in two patients, this did not affect the final healing. Immediate postoperative complications were pain (43.75%), edema (31.25%) and trismus (50%). No late complications occurred, and all patients were free of pain or any limitations after the 3-month follow-up period. Conclusion: The use of pedicled buccal fat pad graft is an acceptable and reliable procedure in closing an oroantral fistulae.

Keywords: Oroantral fistula; pedicled buccal fat pad graft

Introduction

Oroantral fistulae are defined as pathological communications between the oral cavity and maxillary sinus.1-3 Oroantral fistulae most commonly occurs as a complication of maxillary molar or premolar extraction because of the anatomic relationship between the root apices of the premolar and molar teeth and the floor of maxillary sinus.4,5 There are several alternative techniques to close oroantral fistulae, such as soft tissue flap, bone graft, alloplastic material and some other techniques.6 Local soft tissue flaps, such as buccal flap, palatal flap and buccal fat pad flap (BFP), are the preferred technique by surgeons and more than adequate to close oroantral fistulae.6,7 None of these methods are proved to be superior to the other. However, there are certain advantages and disadvantages of these methods. The buccal advancement flap designed by Rehrmann,8 has a broad base which ensures adequate blood supply and, consequently, high success rate (93%).9 Disadvantages of this procedure include the obliteration of gingivobulbar sulcus which makes it difficult to use prosthesis in future.10 Palatal flap ensures better blood perfusion, but the technique is difficult and time consuming. The palatal bone is exposed after the procedure leading to prolonged healing time and pain.11 The BFP is an encapsulated, rounded, biconvex fatty structure located between the buccinator medially and the anterior margin of the masseter muscle, the mandibular ramus, zygomatic arch laterally.11,12 It was first described by Egyedi13 as a pedicled graft covered with skin graft. Tideman et al.13 reported on the idea of using the BFP as a pedicled graft and its complete epithelization without the use of skin graft for closure of oral defects. After these studies, pedicled BFP gained popularity, and various encouraging clinical results have since been reported.14-23 The present study was conducted to evaluate the use of the pedicled buccal fat pad for the closure of oroantral fistula.

Materials and Methods

A retrospective study was conducted among the patients treated for oroantral fistula closure using pedicled buccal fat pad flap at the Department of Oral Surgery, Al-Andalus University of Medical Science during 2011 and 2014. All 16 patients treated with BFP flap for oroantral fistulae closure was included in the study. None of the patients had a history of systemic disease. The parameters evaluated includes patient age and gender, location of the defect, cause of fistula interval from appearance of fistula to repair, and immediate and late complications. The criterion for success was complete closure of the communication. Preoperatively, a panoramic radiographs were taken to ensure the healthy status of the maxillary sinus; the sinus was rinsed daily with saline solution for seven days (three times daily), oroantral fistulae were closed using a BFP only if the status of the sinus was considered healthy.

Surgical Procedures: All of the operations were performed under local anesthesia with 2% lidocaine and 1:80,000 adrenalin. A circular incision with a 3-mm margin was made around the fistula to excise completely the epithelial tract and inflammatory tissue within the opening. The BFP was exposed by a 2-cm horizontal periosteal incision, lateral to the maxillary buttress, extending backward above the maxillary second molar tooth. Blunt dissection through the buccinators and loose surrounding fascia allowed the BFP to herniate into the mouth. The body of the BFP and the buccal extension were gently mobilized by blunt dissection, taking care not to disrupt the delicate capsule and vascular plexus and to preserve as wide a base as possible. Pressure on the cheek helped to express the fat into the mouth. After the pad had been dissected free from the surrounding tissues, it was grasped with vascular forceps, gently pulled out, advanced. Then the pad was passed through tunnel beneath palatal mucoperiosteal flap, came out and sutured to the mucosal edges of the incision at palatal side which made parallel to median line of hard palate. All surgeries were performed by the same surgeon. After the operations, the patients were instructed to avoid activities that may promote pressure changes between the nasal passages and oral cavity for at least two weeks, such as sucking on...
a straw, blowing the nose, and sneezing with a closed mouth. The patients were placed on a specific diet during this period. Antibiotics and nasal decongestants were given for first week postoperatively. Sutures were removed 10 days after the surgery. The criterion for successful repair was complete healing of the flap without symptoms or signs of leakage. Follow-up evaluations were performed at 10 days, 15 days, first month, and third months after treatment.

**Results**
Out of the 16 patients, 68.75% (11/16) were men and 31.25% (5/16) were women. Their age range was 33 to 58 years. The etiology of fistula formation was tooth extraction in all patients. The greatest incidence of oroantral fistulae was found after extraction of the first molar, followed by extraction of the second molar. Of the 16 fistulas, nine were in the left side and seven in the right side of the maxilla. The duration of the fistula in all the patients were longer than one month (range 2nd month to 3rd month), the size of fistula was less of 5 mm in all cases. All cases had successful healing after three months follow up period, and the wounds became successfully epithelialized in 3 to 4 weeks postoperatively. Clinically, the surface of orally exposed fat became yellowish-white in three days, and then gradually became red within one week, which was likely due to the formation of young granulation tissue. This changed into a firmer granulation tissue during the second week, and it became completely epithelialized with a slight contraction of the wound by three weeks after the operation; there was partial necrosis of the flap in two cases but this did not have an effect on the final healing. The most relevant immediate postoperative complications were pain (43.75%), edema (31.25%) and trismus (50%). After the three months follow-up period all cases were healed without any complications (Table 1).

**Discussion**
The purpose of this study was to evaluate the use of pedicled buccal fat pad graft in closure of oroantral fistula. The BFP flap, preferably pedicled type, has been used most commonly for the closure of oroantral communication / oroantral fistulae. In our study, we included 16 patients with oroantral fistulae following tooth removal, and the overall success rate for closure using the BFP was good. Healing usually occurred within two to three weeks, leaving a good mucosal surface. Dolanmaz et al. have considered the pedicled BFP flap to be an acceptable and reliable alternative in management of acute or chronic oro antral communication, and it seems to be the best choice of treatment, especially in recurrent oroantral fistulae. In their series of 75 cases, all of them had a favorable healing course after the operation, and the wounds became successfully epithelialized in 3-4 weeks after surgery. According to Hanazana, when fat tissue is exposed to the oral environment, it becomes epithelialized and it is gradually replaced by fibrous conjunctive tissue within a 30-40-day postoperative period, without any functional damage to the treated site. The most frequent complications described in the literature with this technique are infection, necrosis or partial rupture of the flap. In most cases, it is generated when the defect area is large. In our study the size of fistula was less of 5 mm in all cases and although there was partial necrosis of the flap in two cases but this did not affect the final healing. The complications in Abad-Gallegos M et al were inflammation, edema, rhinorrhea, suppuration and halitosis in the immediate postoperative period but all these problems were resolved within two weeks. We observed pain, trismus, edema in our patients in the immediate postoperative period and also all these problems were resolved within three weeks.

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Table 1. Sample population details
Conclusion
In conclusion, use of pedicled buccal fat pad graft is one of the acceptable and reliable procedures for closing oroantral fistulae.

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References

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