

# Combined Use of Buccal Fat Pad and Buccal Advancement Flap for Large Oroantral Fistula Closure: A Case Report

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## ABSTRACT

Oroantral communication (OAC) is a pathological communication between the oral cavity and the maxillary sinus, most commonly resulting from posterior maxillary tooth extraction. If left untreated, OAC can progress to oroantral fistula (OAF) and may require surgical intervention. This case report presents the diagnosis and treatment of chronic OAF in a 50-year-old male patient with systemic comorbidities such as diabetes and hypertension and a smoking habit. Clinical and radiographic examination confirmed a persistent oroantral defect associated with chronic sinusitis five years after extraction. Surgical closure was performed using a combined approach involving buccal fat pad (BFP) and a buccal advancement flap. With its rich vascular supply, anatomic proximity, and low complication rate, BFP provided an effective solution for large oroantral defects. Postoperative recovery was uneventful, and follow-up showed successful closure and mucosal regeneration. This case highlights the effectiveness of the double-layer surgical technique in managing large, chronic OAFs, especially in patients with complicating systemic factors.

**Keywords:** Oroantral Fistula, Oral Surgical Procedures, Case Reports, Buccal Fat Pad, Surgical Flaps

## Introduction

Oroantral communication (OAC) is defined as an abnormal and open connection between the maxillary sinus and the oral cavity. If this communication is not treated appropriately, this connection does not close spontaneously and may develop into an oroantral fistula (OAF) due to pathological epithelialization in the area [1]. The most common cause of OAC is the extraction of posterior maxillary teeth whose roots are close to the floor of the sinus [2]. Other etiological factors include infection, iatrogenic injury, inflammatory conditions, implant surgery, trauma, Paget's disease, complications from cyst and tumor surgeries [3,4].

In most cases, especially when the defect is smaller than 5 mm, OACs may close spontaneously [5]. However, it has never been conclusively proven that small OACs ( $\leq 5$  mm) will heal on their own. Furthermore, the size of the OAC is difficult to determine clinically. To prevent chronic sinusitis and the development

of OAF, it is generally accepted that these defects should be closed within 24 to 48 hours. Closure is recommended when spontaneous healing does not occur [6,7]. Several factors should be considered when deciding on the treatment of an OAC: the size of the communication, time of diagnosis, and the presence of infection. In addition, the treatment strategy is influenced by the amount and condition of available tissue for repair and whether dental implants are planned in the future [8,9].

Closure is usually achieved through various surgical procedures, depending on the size of the opening. In cases of small OACs, simple suturing of the socket may be sufficient. When this approach does not ensure adequate closure, soft tissue flap procedures and bone grafts are preferred. Among the various techniques, autogenous soft tissue flaps are the most commonly used for OAC closure [8,9]. The most frequently applied flap techniques include buccal advancement flaps, palatal flaps, Bichat fat pad flaps, and tongue flaps [2,8].

The buccal fat pad (BFP), also known as Bichat's fat pad, is a specialized mass of adipose tissue located in the buccal

region [10]. Its name derives from the French anatomist Marie-François Xavier Bichat (1771–1802), who first described it in the early 19<sup>th</sup> century [10,11]. The first use of BFP for clinical purposes was proposed in 1977 by Egyedi, who introduced it for closure of oroantral and oronasal communications [11,12]. BFP was later used as a free graft by Neder in 1983, and as a pedicled graft by Tideman three years later. This technique allows epithelialization of the graft within 2–3 weeks without requiring skin graft coverage [12,13].

BFP has a wide range of applications in oral surgery, including treatment of jaw osteonecrosis, surgeries involving temporomandibular joint ankylosis, root surface coverage, closure of oroantral fistulas, bone defect repair, oronasal fistula closure, cleft-related surgeries, post-tumor defect reconstruction, and other reconstructive procedures. Advantages of BFP include easy mobilization, excellent vascular supply, favorable anatomic relationship to the maxillary bone and hard/soft palate, minimal donor site morbidity, and low complication rates [2,10-14].

## Case Report

### Diagnosis

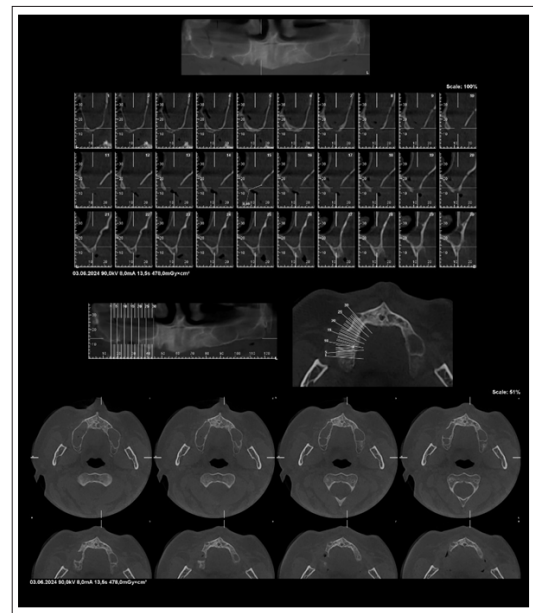
A 50-year-old male smoker patient with a medical history of diabetes and hypertension referred to our clinic. Intraoral examination revealed the presence of an approximately 6 mm oval-shaped soft tissue defect in the buccal region near the crest of the right posterior maxilla (Figure 1). It was observed that the gum adjacent to the defect area was healthy in terms of color and contour. Clinical and radiographic examinations confirmed that there was an abnormal communication between the defect area and the maxillary sinus.



**Figure 1:** Intraoral view showing the oroantral fistula in the right posterior maxilla

The patient reported a history of upper jaw tooth extraction five years ago at another clinic. The patient reported that he did not

use a total prosthesis and the communication had persisted since the extraction of tooth number 17. The patient complained about the food and liquids regurgitated through his nose and feeling of fullness in the right maxillary sinus area. He did not report any pain, swelling or bad smell. To assess the relationship between the defect and the maxillary sinus and determine the bony boundaries, cone-beam computed tomography (CBCT) was performed. Radiographic findings revealed a defect measuring 11 mm buccopalatal and 15 mm mesiodistal at the floor of the right maxillary sinus. Mucosal thickening consistent with chronic sinusitis was also observed (Figure 2).



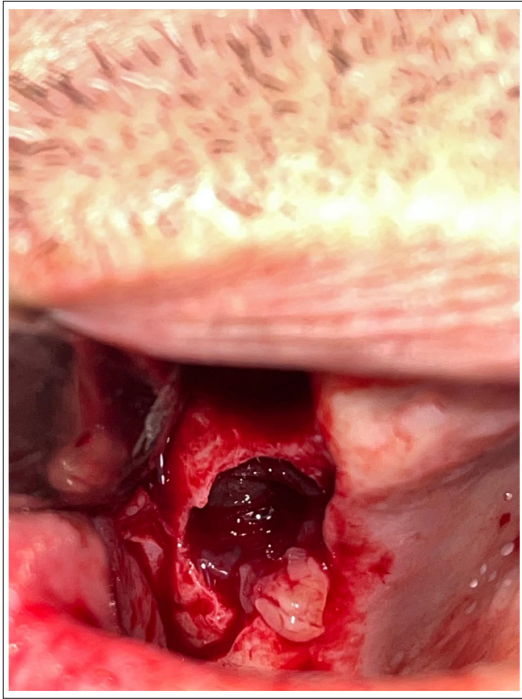
**Figure 2:** CBCT image showing the defect and associated chronic sinusitis

As a result of the anamnesis and dental and radiographic examination, the patient was diagnosed with OAF. Surgical closure with the buccal fat pad and a buccal advancement flap under local anesthesia was planned. The patient was premedicated with amoxicillin/clavulanic acid (625 mg twice daily) for five days prior to surgery.

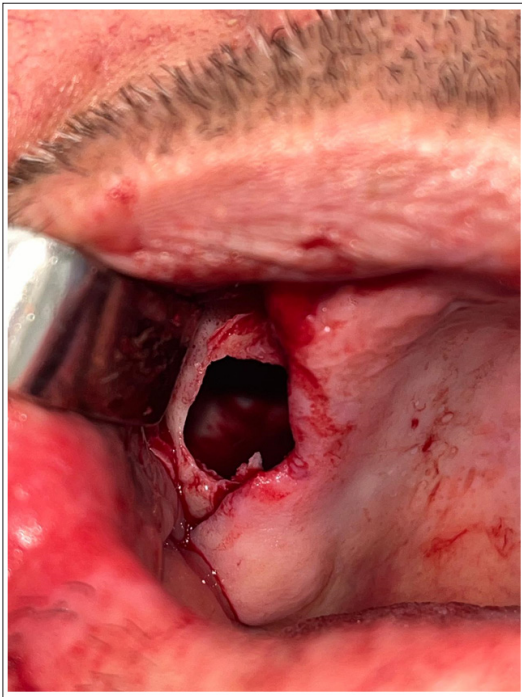
### Surgical Procedure

Local anesthesia (80 mg articaine with 0.02 mg epinephrine; Maxicain Fort 80 mg/2 ml + 0.02 mg/2 ml) was applied to the right maxillary vestibular sulcus and palatal gingiva. The incision line was planned from the canine region anteriorly to the maxillary tuberosity posteriorly. A crestal incision was made and extended toward both the buccal and palatal aspects of the fistula. The incision line was then reunited and extended posteriorly to the maxillary tuberosity with vertical releasing incisions placed anteriorly and posteriorly. This approach allowed for complete excision of the fistulous tract (Figure 3). Following this, a mucoperiosteal flap was elevated, and the infected sinus mucosa was thoroughly curetted (Figure 4).



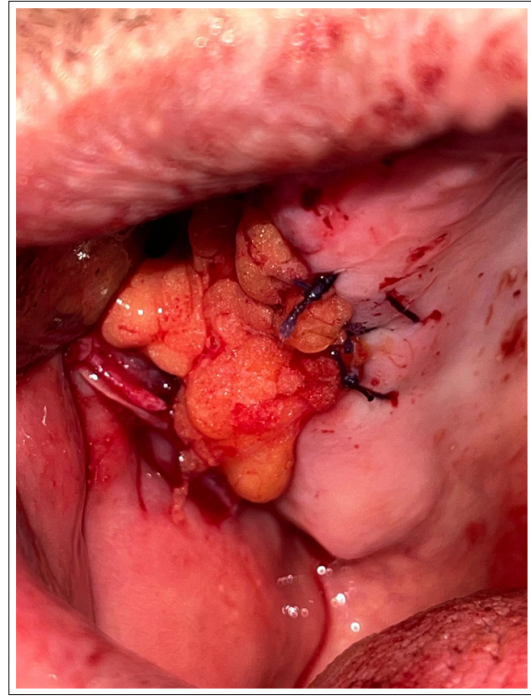


**Figure 3:** Incision design



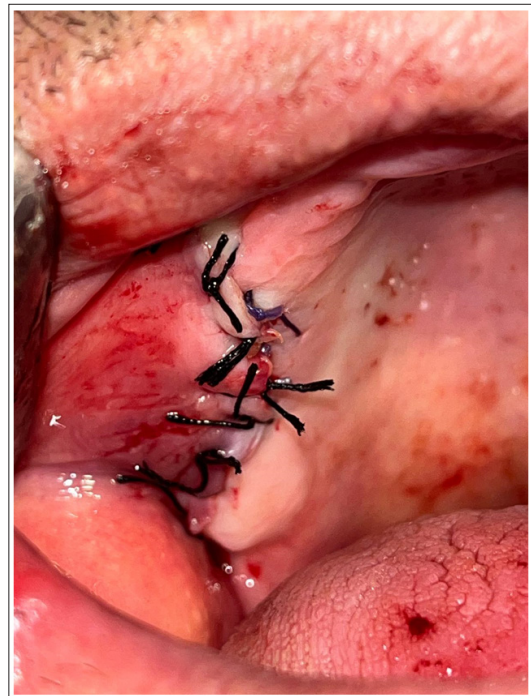
**Figure 4:** Curettage of infected sinus mucosa

A 1 cm horizontal incision was made at the depth of the raised flap to gain access to the Bichat fat pad. The mucosa and fascia were dissected to expose the buccal fat pad, which was gently mobilized using a curved hemostat. A sufficient amount of fat was harvested and sutured to the palatal gingiva using 3-0 resorbable polyglycolic acid sutures (Figure 5).



**Figure 5:** Harvesting and placement of the buccal fat pad

The buccal flap was relaxed with a periosteal incision to achieve tension-free closure and sutured to the palatal mucosa with 3-0 non-resorbable silk sutures (Figure 6).

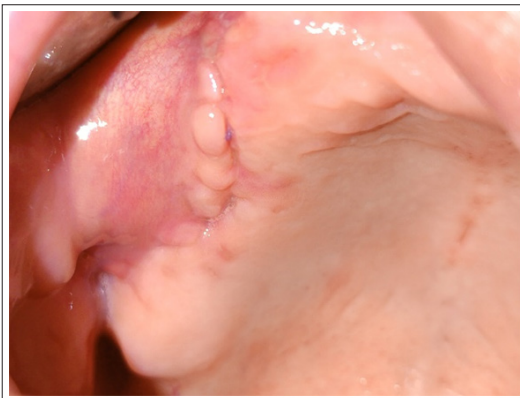


**Figure 6:** Tension-free closure using buccal advancement flap

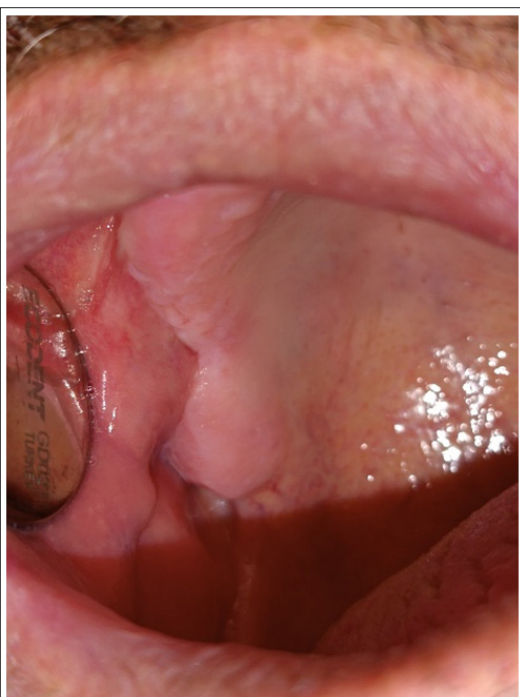
Postoperative recommendations were made to the patient. Antibiotics (amoxicillin + clavulanic acid), analgesics, mouth rinse and nasal decongestants were prescribed for use after the procedure. The patient was followed up on postoperative day 2, day 4, week 1 (Figure 7), week 2 (Figure 8), and after 1 month.



**Figure 7:** Postoperative 1<sup>st</sup> week view



**Figure 8:** Postoperative 2<sup>nd</sup> week view



**Figure 9:** Postoperative 1<sup>st</sup> month view

### Discussion

Oroantral communication (OAC) typically results from tooth extractions, trauma, or surgical procedures involving the posterior maxilla. Closure is essential to prevent complications such as chronic sinusitis, infections, or the development of an oroantral fistula. Various techniques have been described for the management of OAC, with the primary goal being closure of the communication and prevention of long-term sequelae.

This case report presents the combined use of the buccal fat pad (BFP) and buccal advancement flap in the treatment of an OAF caused by an untreated OAC. The buccal fat pad, located in the cheek, is widely used in oral and maxillofacial surgery due to its versatility in reconstructive procedures. Its rich vascularity, ease of access and ability to provide a functional seal make it a reliable option for OAF closure. The proximity of the BFP to the surgical site allows for minimal dissection, making it an ideal alternative to more technically demanding methods like bone grafting.

Although alternative methods for OAC closure exist, their effectiveness compared to the BFP remains a subject of discussion. Von Arx et al. reported that while buccal advancement flaps are commonly used, the BFP offers superior outcomes [15]. Similarly, Shukla et al. emphasized the superiority of BFP closure despite higher morbidity rates [16].

In most cases, the use of the buccal fat pad alone is sufficient to close oroantral fistulas. However, in this case, factors such as the size of the oroantral communication, poor oral hygiene, smoking, and the patient's systemic condition (diabetes) necessitated a modified approach. The combined use of the buccal fat pad and buccal advancement flap was preferred to restore a barrier compatible with the natural sinus flora, thereby minimizing infection risk and enhancing postoperative healing. The use of combined methods in the closure of OAF increases the chance of success by eliminating the disadvantages associated with using either method alone [17]. The combined use of the buccal fat pad and buccal advancement flap is generally recommended only in cases where the buccal fat tissue is insufficient or perforated [18]. Candamourty et al. recommend using both methods together in cases where OAC is 5 x 1 cm<sup>2</sup> or larger [19]. In our opinion, the use of combined methods in medically compromised or high-risk cases offers a more effective and predictable outcome, with accelerated healing and reduced postoperative complications.

The main drawback of this combination is the potential sulcus depth reduction due to the advancement flap. However, this can be corrected with a simple procedure. The stability and rapid healing provided by the buccal advancement flap led us to prefer this combined surgical technique.

In conclusion, for large oroantral fistulas with systemic and local complicating factors, the combined use of the buccal fat pad and buccal advancement flap offers a relatively simple and effective solution, incorporating the benefits of both techniques.

### Conflict of Interest

The authors declare that they have no conflict of interest related to this publication.



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