



Closure of an Oroantral Communication Using Bichat's Fat Pad: A Case Report

Fatima Ezzahra Farouq, Dounia Sarfi, Chaimaa Moujoud, Ihssane BenYahya

Oral Surgery, Dental Consultation and Treatment Center, Ibn Rochd University Hospital Center, Casablanca, Morocco

Email: Farouqfaty74@gmail.com

How to cite this paper: Farouq, F.E., Sarfi, D., Moujoud, C. and BenYahya, I. (2025) Closure of an Oroantral Communication Using Bichat's Fat Pad: A Case Report. *Open Access Library Journal*, **12**: e13394. <https://doi.org/10.4236/oalib.1113394>

Received: April 5, 2025

Accepted: May 24, 2025

Published: May 27, 2025

Copyright © 2025 by author(s) and Open Access Library Inc.

This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

An oroantral communication (OAC) is a pathological connection between the oral cavity and the maxillary sinus. When it fails to close spontaneously, it remains open and epithelializes, leading to the development of an oroantral fistula. It is a common complication following the extraction of maxillary premolars and molars due to the anatomical proximity of the root apices of these teeth to the maxillary sinus. Several surgical options exist for its management, particularly the use of Bichat's fat pad, which has proven to be an effective and reliable technique. In this article, we report a case of OAC successfully treated by traction of Bichat's fat pad.

Subject Areas

Clinical Medicine

Keywords

Oroantral Communication, Surgical Treatment, Bichat's Fat Pad

1. Introduction

An oroantral communication (OAC) is a pathological osteomucosal continuity between the oral cavity and the maxillary sinus. If left untreated or if treatment fails, this communication can lead to chronic sinusitis or oroantral fistula due to pathological epithelialization of the trajectory [1] [2]. This epithelialization process generally occurs when the perforation persists for at least 48 - 72 hours [2].

OACs are often of iatrogenic origin following the extraction of maxillary molars and premolars (48%), explained by the anatomical proximity of the root apices of the posterior maxillary teeth to the sinus floor, with distance varying between 1 and 7 mm [2]. Other causes or circumstances may lead to OACs, such as congen-

ital malformations (cleft lip-palate), implant and pre-implant surgery, cyst enucleation, endodontic surgery, and maxillary osteonecrosis [2] [3].

An OAC smaller than 5 mm in diameter can close spontaneously with a quality blood clot, provided the sinus is healthy. For larger defects, surgical closure is strongly recommended [3].

In the literature, various surgical techniques have been described, making the choice difficult for the dental or maxillo-facial surgeon. However, certain factors need to be taken into account in this decision, such as the condition of the sinuses, the duration and size of the OAC, and the prosthetic rehabilitation envisaged [3] [4]. Among the most commonly used techniques are the coronally advanced flap, the palatal flap, and the traction of the Bichat fat pad [2].

The objective of this article is to report a case of OAC successfully treated by Bichat's fat pad.

2. Case Report

A 32-year-old man with no significant medical history presented with a sensation of air leakage between the oral and nasal cavities, accompanied by pain in the upper right cheek, worsened by gravity. These symptoms appeared two months after the extraction of a maxillary molar by a non-professional.

Endobuccal clinical examination revealed a 10 mm-diameter OAF at the 16 extraction site, surrounded by healthy, clean, non-inflammatory mucosa (Figure 1).

The Valsalva maneuver was positive, and panoramic radiography confirmed a continuity defect between the oral cavity and the right maxillary sinus (Figure 2). A diagnosis of sinusitis associated with an OAC was made.



Figure 1. Endo-buccal view of OAF.



Figure 2. A panoramic radiograph revealed a right bony defect at the extraction site, and there was also the presence of a perforation of the floor of the right maxillary sinus.

The patient received antibiotic therapy with 1g of amoxicillin and 125 mg of clavulanic acid twice daily for 10 days to sanitize the sinus before proceeding with the closure of the OAC using Bichat's fat pad.

After local anesthesia, two divergent vestibular incisions were made on either side of the dehiscence. A full-thickness trapezoidal mucoperiosteal flap was raised, revealing the true size of the OAC, estimated at 15 mm (**Figure 3**). We then proceeded to curettage the granuloma and irrigate the communication with saline solution.

This irrigation was followed by dissection in the vestibule from the raised flap. A 1 cm vertical incision made in the periosteum, behind the zygomatic process, allowed for exposure of the buccal process of the Bichat fat pad (**Figure 4**).



Figure 3. Bony defect related to the OAF.

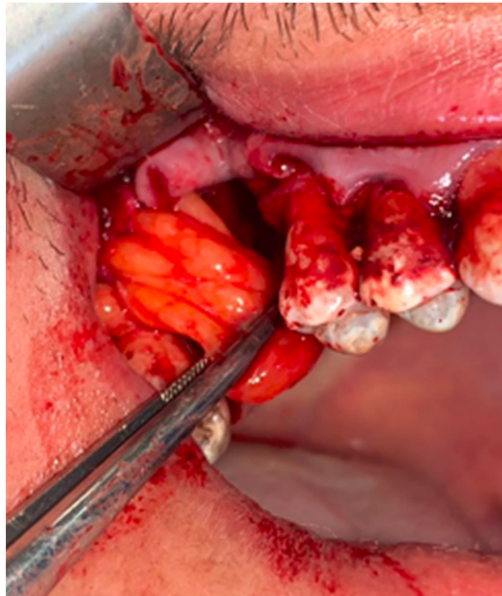


Figure 4. Exposure of the Bichat fat pad.

The pad was gently retracted by applying external pressure below the zygomatic arch and then advanced to cover the fistula. It was sutured without tension to the palatine bank using separate sutures of absorbable threads (**Figure 5**).

The patient was asked to continue antibiotics for 8 days, along with a short course of corticosteroids and analgesics. He was also advised to avoid maneuvers that increase sinus pressure (such as blowing his nose, using mouthwashes, or forceful sneezing).

Follow-up revealed that the patient's symptoms had disappeared, with complete epithelialization of the Bichat's fat pad after two months (**Figures 6-8**).



Figure 5. Recovery of the fistula by the buccal fat pad.



Figure 6. 10-day follow-up.



Figure 7. One-month follow-up.



Figure 8. Two-month follow-up.

3. Discussion

OACs represent a pathological continuity between the oral cavity and the maxillary sinus, creating a pathway for bacterial and fungal penetration, which leads to maxillary sinusitis in 60% of cases or to pansinusitis [2]. These complications are common in oral surgery, especially following extractions of posterior maxillary teeth. According to the literature, the maxillary first molar is responsible for 27% of iatrogenic OACs [5], as observed in our case.

The diagnosis of an OAC relies on a combination of elements gathered from the medical history, clinical examination, and radiological assessment. In the case of an immediate OAC following dental extraction, the first sign that may be observed is the presence of air bubbles in the socket, accompanied by hemorrhage due to significant vascularization. To confirm the diagnosis, the Valsalva maneuver is often used, consisting of forced exhalation while pinching the nose [6] [7]. This maneuver is considered positive in the presence of whistling, bubbling, or misting observed on a mirror [1].

In the long term, the patient may be asymptomatic or may consult for eating disorders, nasal obstruction, trouble breathing, a feeling of air leakage, problems blowing the nose, or a nasal discharge. These symptoms may be associated with signs of acute or chronic maxillary sinusitis [1] [6] [7].

The endobuccal examination must be systematic and include a complete assessment of the oral cavity and the fistula. It allows for the evaluation of the fistula's size and location, which is most often alveolar but can also be vestibular or palatal. It also determines the state of the surrounding mucosa, which may be clean and non-inflammatory, indicating tissue reorganization, or inflammatory with the presence of granulation tissue [7] [8].

The Valsalva maneuver can be used to confirm the presence of an OAC. However, a negative test does not exclude the possibility of a perforation of the sinus membrane. It is important to note that detecting small perforations is not always possible [3]. Careful exploration of the fistula can be performed using a periodontal probe, curette, or stylet. However, this approach is controversial, as it may cause laceration of the sometimes intact sinus membrane [3] [9]. Endobuccal examination should reveal any infectious sites in the vicinity of the OAC that could compromise healing and induce a sinus infection [10].

Panoramic radiography and Cone Beam Computed Tomography (CBCT) can be used to determine the size of the bony defect, the presence of an intrasinus foreign body or detect any concomitant sinus pathology [1] [2].

The assessment can be complemented by anterior rhinoscopy and nasofibroscopy to evaluate the sinus mucosal condition and search for any tumor pathology [7].

Regardless of the surgical technique considered for closing the OAC, it must be preceded by medical treatment aimed at sanitizing the sinus [1]-[3]. For acute dental-origin sinusitis, the microbial load is higher and more diverse, with a significant prevalence of beta-lactamase-producing bacteria. The first-line choice is

an aminopenicillin such as amoxicillin protected by clavulanic acid, with or without metronidazole, at a dosage of 2 to 3 g/day [11] [12]. In case of penicillin allergy, pristinamycin can be prescribed at a dosage of 2 g/day in two doses for 10 days [11] [12].

OACs less than 2 mm and not epithelialized may close spontaneously in the absence of infection. However, defects larger than 5 mm in diameter or those persisting for more than 3 weeks require surgical intervention [9] [10] [13]. Among the commonly used techniques are the coronally advanced flap, the traction of Bichat's fat pad, and the palatal flap. The choice may be influenced by the size and location of the defect, the planned prosthetic rehabilitation, and the practitioner's experience [9] [13] [14].

The coronally advanced flap, created by Rehrman, is the oldest known technique for the treatment of oroantral communications (OACs), with a success rate of 93%. It involves a vestibular flap of trapezoidal shape advanced coronally to close the bony defect. Its wide base would provide the vascular supply necessary for the success of this technique. This method appears to be ineffective for closing OACs larger than 10 mm and also leads to postoperative pain and edema, with a reduction in vestibular depth. If deepening of the vestibule is to be considered, it should be done at least 6 months after the procedure [3] [4] [6] [14].

The palatal rotation flap is widely used for closing OACs larger than 10 mm, or when vestibular depth needs to be preserved, or in cases of limited mobility of vestibular tissue. The method involves creating a full-thickness flap containing the anterior part of the palatine artery to ensure sufficient blood supply. The length of the flap should be 3 to 4 cm to allow for lateral rotation without difficulty, with a width between 1.5 and 1.8 cm. It is positioned 2 to 3 mm from the palatal midline and 5 mm from the palatal gingiva to avoid any periodontal damage. The major disadvantage is the exposure of the hard palate's bony structure, requiring 2 to 3 months for re-epithelialization, which can lead to post-operative pain and oedema [1] [7] [9] [14].

For our case, we opted for closure using Bichat's fat pad due to the size of the OAC being greater than 5 mm, and the patient was not interested in implant rehabilitation.

Bichat's fat pad was initially described in 1732 by Heister as a glandular structure but was re-identified as adipose tissue in 1802 by Bichat. Its use in closing OACs was introduced by Egyedi in 1977 [9]. It is an encapsulated structure located in the masticatory space, composed of a central body and four extensions: buccal (or vestibular), pterygoid, pterygopalatine, and temporal. It is vascularized by the deep and superficial temporal vessels, as well as branches of the facial artery.

The surgical technique involves raising a full-thickness trapezoidal vestibular flap around the OAC, followed by making a vertical incision of 1 cm in the posterior area opposite the maxillary tuberosity. This incision opens the space of the buccal fat pad. The fat pad is then carefully mobilized by applying external pressure beneath the zygomatic arch until it reaches the OAC, while preserving a wide

pedicle. It is sutured with resorbable thread, without tension, to the de-epithelialized margins of the fistula. The resulting flap is sutured and repositioned to its original position [2] [4] [9] [10] [14] [15]. The fat pad epithelializes within 4 to 6 weeks, allowing for the closure of the bone defect. The success of this technique is attributed to the good vascularization of the fat pad, making it a preferred option for larger bone defects (between 10 and 15 mm). Its main disadvantage is the risk of necrosis of the exposed fat pad. Trismus is also reported. To mitigate this issue, opening and closing exercises are recommended starting from the 5th day after surgery [2] [4] [9] [10] [14] [15].

Several studies have been conducted to evaluate the efficacy of this technique.

Marwa T. Ibrahim *et al.* assessed this technique in 10 patients with OACs of an average size of 8.4 mm. A success rate of 90% was observed. Postoperative pain, measured using the visual analog scale, averaged 5.5 during the first week after surgery and 0 the fourth postoperative week. Complete epithelialization was achieved after one month, and no decrease in vestibular depth was reported [16].

Natashekara Mallesh *et al.* evaluated this technique in 20 patients with an average OAC size of 7 mm. They reported a success rate of 100% with no postoperative complications [17].

Rocío Alonso-González *et al.* assessed patient satisfaction six months after the closure of an OAC using the buccal fat pad. In general, patients were satisfied with both aesthetic and functional aspects (mastication and phonation) [18].

Risshi Bhatt *et al.* conducted a clinical study comparing the effectiveness of the vestibular flap technique with that of the buccal fat pad for the closure of OACs. Several parameters were evaluated, including postoperative pain and swelling, vestibular depth, recurrence, and long-term follow-up. They concluded that the buccal fat pad provided a more promising closure by offering a better base in terms of adequate vascularization and minimal morbidity. Therefore, for OACs larger than 5 mm, the buccal fat pad is the technique of choice [19].

A similar study was conducted by Rasoul Gheisari *et al.*, comparing three techniques: the coronally advanced flap, the palatine flap, and the buccal fat pad. They concluded that the buccal fat pad, due to its adequate blood supply, the ease of the surgical technique, and minimal side effects, can be used as a safe approach for the closure of OACs [20].

4. Conclusion

OAC is a non-negligible complication in oral surgery. The choice of surgical closure technique depends on the clinical situation. The buccal fat pad technique described in this work presents a reliable, easy, and predictable treatment option for the closure of OACs.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] Bhalla, N., Sun, F. and Dym, H. (2021) Management of Oroantral Communications. *Oral and Maxillofacial Surgery Clinics of North America*, **33**, 249-262. <https://doi.org/10.1016/j.coms.2021.01.002>
- [2] Chekaraou, S.M., Benjelloun, L. and EL Harti, K. (2021) Management of Oro-Antral Fistula: Two Case Reports and Review. *Annals of Medicine & Surgery*, **69**, Article 102817. <https://doi.org/10.1016/j.amsu.2021.102817>
- [3] Rathod, R.N. and Mihika, A.M. (2020) Diagnosis, Decision-Making Management in Closure of Oroantral Communication & Fistula. *International Journal of Creative Research Thoughts*, **8**, 2320-2882.
- [4] Konate, M., Sarfi, D., El Bouhairi, M. and Benyahya, I. (2021) Management of Oroantral Fistulae and Communications: Our Recommendations for Routine Practice. *Case Reports in Dentistry*, **2021**, 1-6. <https://doi.org/10.1155/2021/7592253>
- [5] Shahrou, R., Shah, P., Withana, T., Jung, J. and Syed, A.Z. (2021) Oroantral Communication, Its Causes, Complications, Treatments and Radiographic Features: A Pictorial Review. *Imaging Science in Dentistry*, **51**, 307-311. <https://doi.org/10.5624/isd.20210035>
- [6] ANSM (2021) Prescription des antibiotiques en pratique bucco-dentaire.
- [7] Workman, A.D., Granquist, E.J. and Adappa, N.D. (2018) Odontogenic Sinusitis: Developments in Diagnosis, Microbiology, and Treatment. *Current Opinion in Otolaryngology & Head & Neck Surgery*, **26**, 27-33. <https://doi.org/10.1097/moo.0000000000000430>
- [8] Bravo Cordero, G., Minzer Ferrer, S. and Fernández, L. (2016) Sinusitis odontogénica, fístula oroantral y su reparación quirúrgica mediante colgajo de bolsa de Bichat: Revisión de la literatura. *Acta Otorrinolaringológica Española*, **67**, 107-113. <https://doi.org/10.1016/j.otorri.2015.03.001>
- [9] Fatani, B., Fatani, A. and Alomar, A. (2020) Oro-Antral Communication and Fistula: A Review of the Literature. *Saudi Journal of Oral and Dental Research*, **5**, 575-581. <https://doi.org/10.36348/sjodr.2020.v05i12.002>
- [10] Parvini, P., Obreja, K., Begic, A., Schwarz, F., Becker, J., Sader, R., et al. (2019) Decision-Making in Closure of Oroantral Communication and Fistula. *International Journal of Implant Dentistry*, **5**, Article No. 13. <https://doi.org/10.1186/s40729-019-0165-7>
- [11] Kwon, M., Lee, B., Choi, B., Lee, J., Ohe, J., Jung, J., et al. (2020) Closure of Oroantral Fistula: A Review of Local Flap Techniques. *Journal of the Korean Association of Oral and Maxillofacial Surgeons*, **46**, 58-65. <https://doi.org/10.5125/jkaoms.2020.46.1.58>
- [12] Zaher, B., Kissi, L. and Ben Yahya, I. (2022) Relations dents et sinus. Le courrier du dentiste.
- [13] Nelke, K., Morawska, A., Błaszczuk, B., Janeczek, M., Pasicka, E., Łukaszewski, M., et al. (2023) Anatomical and Surgical Implications of the Usage of Bichat Fat Pad in Oroantral Communication, Maxillary, Palatal, and Related Surgeries—Narrative Review. *Journal of Clinical Medicine*, **12**, Article 4909. <https://doi.org/10.3390/jcm12154909>
- [14] Lerat, J., Aubry, K., Brie, J., Perez, A.F., Orsel, S. and Bessede, J.P. (2011) Communications bucco-naso-sinusiennes. *EMC—Oto-rhino-laryngologie*, **6**, 1-10. [https://doi.org/10.1016/s0246-0351\(11\)56402-5](https://doi.org/10.1016/s0246-0351(11)56402-5)
- [15] Ibrahim, M.T., Gharieb, E.A. and Sheta, M.S. (2024) A Pedicled Buccal Periosteal Flap

- for the Closure of Oro-Antral Fistula. *BMC Oral Health*, **24**, Article No. 440. <https://doi.org/10.1186/s12903-024-04217-6>
- [16] Mallesh, N., Akshatha, M.V. and Hussien, H. (2020) Study of the Efficacy of Pedicled Buccal Fat Pad Graft Technique in the Management of Oro-Antral Communications. *International Journal of Dentistry Research*, **5**, 7-13. <https://doi.org/10.31254/dentistry.2020.5103>
- [17] Alonso-Gonzalez, R., Penarrocha-Diago, M., Penarrocha-Oltra, D., Aloy-Prosper, A., Camacho-Alonso, F. and Penarrocha-Diago, M. (2015) Closure of Oroantral Communications with Bichat's Buccal Fat Pad. Level of Patient Satisfaction. *Journal of Clinical and Experimental Dentistry*, **7**, e28-e33. <https://doi.org/10.4317/jced.51730>
- [18] Bhatt, R., Barodiya, A., Singh, S. and Awasthi, N. (2018) Comparison between Pedicled Buccal Fat Pad Flap and Buccal Advancement Flap for Closure of Oroantral Communication. *Journal of Applied Dental and Medical Sciences*, **4**.
- [19] Gheisari, R., Hosein Zadeh, H. and Tavanafar, S. (2019) Oro-Antral Fistula Repair with Different Surgical Methods: A Retrospective Analysis of 147 Cases. *Journal of Dentistry*, **20**, 107-112. <https://doi.org/10.30476/DENTJODS.2019.44920>
- [20] Verma, R.R. and Verma, R. (2021) Oro-Antral Fistulas and Their Management: Our Experience. *Indian Journal of Otolaryngology and Head & Neck Surgery*, **74**, 1576-1583. <https://doi.org/10.1007/s12070-021-02739-x>