



The Facial Emphysema After Bichat Fat Pad Closure of the Oroantral Communication: Case Report

Oroantral İletişimin Bichat Yağ Yastığı ile Kapatılmasından Sonra Gelişen Yüz Amfizemi: Olgu Sunumu

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ABSTRACT

Oroantral communication (OAC) is a common complication in oral and maxillofacial surgery and usually occurs after tooth extraction. The buccal fat pad (BFP) procedure is a relatively safe approach for closing an OAC. However, this procedure can lead to complications such as swelling, hematoma, infection, and subcutaneous facial emphysema (SFE). SFE is a swelling that increases by the invasion and spreading of air into the deep tissue and cervicofacial planes, causing dissection of the skin. The diagnosis of SFE is usually made by observing swelling, and the finding of crepitus through palpation. SFE is usually a self-limiting complication and managed by careful postoperative follow-up; however, in some cases, it may require antibiotic prophylaxis and surgical decompression. In this case report, a rare case of SFE, which was developed following treatment of OAC by using BFP, is described.

Keywords: Oroantral communication, buccal fat pad, emphysema

INTRODUCTION

Oroantral communication (OAC) and development of an oroantral fistula (OAF) are common complications of tooth extraction (1). Various surgical methods have been described for the closure of the OAF/OAC, including buccal or palatal flaps and their modifications (2). The choice of the technique depends on the surgeon's decision.

In 1977, Egyedi described the application of the buccal fat pad (BFP) for the palatal defect. Since then, BFP has been used for

ÖZ

Oroantral açıklık (OAA), ağız, diş ve çene cerrahisinde sık görülen bir komplikasyondur ve genellikle diş çekimi sonrası ortaya çıkar. Bukkal yağ dokusunu (BYD) kullanarak OAA'nin kapatılması nispeten güvenli bir yaklaşımdır. Ancak bu prosedür; şişlik, hematoma, enfeksiyon ve subkutanöz fasiyal amfizem (SFA) gibi komplikasyonlara yol açabilir. SFA, havanın derin doku ve servikofasiyal planlara invazyonu ve yayılımı ile ortaya çıkan, derinin diseksiyonuna neden olan bir şişliktir. SFA'nın tanısı genellikle şişlik gözlemlenmesi ve palpasyonla krepitasyon bulgusunun saptanması ile konulur. SFA genellikle kendi kendini sınırlayan bir komplikasyondur ve dikkatli postoperatif takip ile yönetilir; ancak bazı vakalarda antibiyotik profilaksisi ve cerrahi dekompresyon gerekebilir. Bu olgu sunumunda, OAA'nın BYD kullanılarak tedavisini takiben gelişen nadir bir SFA vakası tanımlanmaktadır.

Anahtar Sözcükler: Amfizem, bukkal yağ yastığı, oroantral açıklık

severe surgeries, including bone defects after tumor excision, the treatment of OAC/OAF, osteonecrosis of the jaws, and cleft repair and lift repair. Recently, the use of BFP for the reconstruction of OAC/OAA has become quite common (3).

BFP is a relatively safe surgical procedure; however, it may be associated with complications such as partial or complete loss of the flap, limited mouth opening, swelling, hematoma, and/or infection. This procedure may cause complications such as swelling, hematoma, infection, and subcutaneous facial emphysem (SFE) (1).

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The diagnosis of SFE is usually made by swelling and the finding of crepitus by palpation. SFE is usually a self-limiting complication and managed by careful postoperative follow-up; however, in some cases, it may require antibiotic prophylaxis and surgical decompression.

In the present case, a rare complication of SFE was described, which occurred following closure of OAC by means of BFP.

CASE REPORT

A 27-year-old male patient was referred to the oral and maxillofacial surgery department for the extraction of the left first molar. The medical history was unremarkable. Extraoral examination was within normal limits. On intraoral examination, an unrecoverable depth of caries was detected in tooth 26, and extraction was planned. A panoramic radiography examination showed the close relationship between posterior maxillary tooth roots and the maxillary sinus (Figure 1). Informed consent was obtained from the patient, and the extraction was performed without using high-speed air turbine drills. Following the extraction of the tooth, an OAC was observed. The defect was approximately 5 to 10 mm.

The treatment plan included double-layered closure of the OAC with BFP and oral mucosa. A trapezoidal mucoperiosteal flap was created by means of a sulcular incision along the alveolar ridge. Bichat adipose tissue was used to close the entire defect resulting from the OCA. Considering the anatomical position of the papilla parotidea, a 1 cm vertical incision was made posterior to the zygomatic buttress. Buccal extension of Bichat's fat pad was explored by blunt dissection through the buccinator muscle (4,5). The necessary amount of Bichat's fat pad was mobilized with light pressure to cover the OAF entirely. The full-thickness flap was sutured with resorbable suture without tension. Metronidazole 500 mg (Sanofi, İstanbul, Türkiye) and amoxicillin + clavulanic acid 1 g (GlaxoSmithKline, İstanbul, Türkiye) were prescribed twice daily for 14 days.

About 1 hour after the operation, the patient returned to the oral and maxillofacial surgery department with the complaint of facial swelling within a few seconds (Figure 2). The patient reported that he had a sudden swelling, which occurred immediately after running up the stairs. The swelling and crepitus were noted on palpation. On intraoral examination, the surgical area was intact, and no signs of bleeding were observed. In the postoperative follow-up period, the swelling decreased slightly after 12 hours (Figure 3), and minimal

bleeding and pain were observed. The subcutaneous emphysema was completely resolved in 10 days (Figure 4, 5).

DISCUSSION

OAC is a pathological pathway between the maxillary sinus and the oral cavity, and epithelization occurs over time. This process leads to the formation of OAF (6). The most frequent precipitating factor is the extraction of posterior maxillary molars. Dental implant surgery, excision of pathologic lesions, maxillary osteotomies, facial trauma and maxillary osteomyelitis are among the other conditions that may cause OAC (6).



Figure 2. Photographs taken 1 hours postoperatively showing SFE. SFE: Subcutaneous facial emphysema



Figure 1. Orthopantomography showed the relationship between posterior maxillary tooth roots and the maxillary sinus.

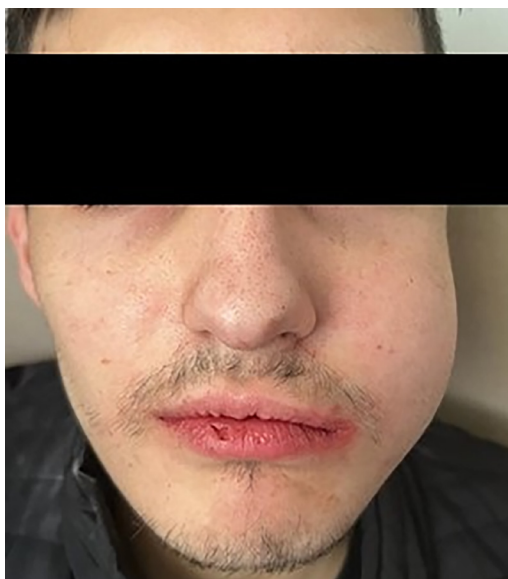


Figure 3. In the postoperative follow-up period, the swelling began to resolve slightly after 12 hours.



Figure 4. In the photograph taken after 24 hours, it is seen that SE decreases and is self-limiting.

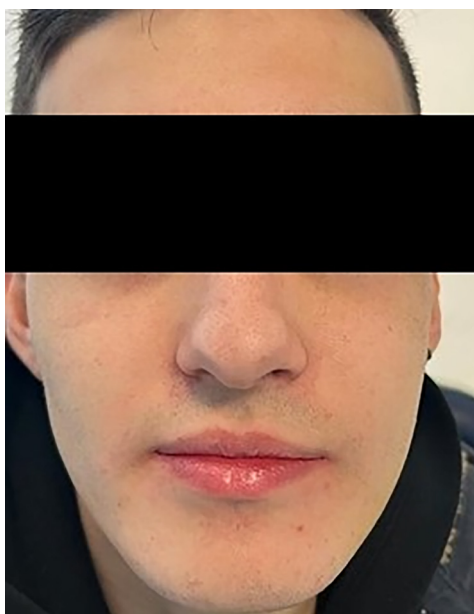


Figure 5. Photographs showing reswelling at 10 days postoperatively.

The surgical management of OAC depends on the location, quantity, and quality of tissue at the defect site, the dimension of OAC, vestibular depth, and the clinical experience of the surgeon (5). Treatment options are primary closure with local and distant sliding tissue flaps, autogenous bone grafts, allogeneous materials, xenografts, and synthetic metals (2).

BFP has been frequently used in oral and maxillofacial surgery, including the reconstruction of OAC (7). The effortless mobilization, rich blood supply, and minimal donor site morbidity make this method preferable to surgeons (8). Dolanmaz et al. (9) reported outcomes of their case series of 75 OAC patients. In this study, the

authors observed a favorable recovery period in all the patients, and the surgical areas were completely epithelialized in 3 to 4 weeks following surgery.

BFP is a well-established and relatively reliable procedure; however, this procedure may cause complications such as swelling, hematoma, and infection (6). Additionally, SFE has been described in the literature as a rare complication following OAC closure with BFP. There are a few reports regarding the cause and clinical course of SFE (1,6,10). Differential diagnosis of SFE should be made among conditions such as hematoma, allergic reactions, or angioedema that may cause an increase in facial volume (11).

SFE is the result of the spread of air along the facial and deep tissue planes. It is characterized by swelling and crepitus on palpation (6). The presence of crepitus on auscultation is the specific pathognomonic sign of SFE on examination with a stethoscope (12). The presence of SFE can also be confirmed radiologically by the appearance of radiolucency in the facial spaces (13). The occurrence of SFE may be explained by 2 mechanisms, including the use of compressed air procedures (high-speed dental handpiece, air-water syringe) and the initiation of communication between the oral cavity and the deeper facial planes and subcutaneous space (14). In dentistry, the most common cause of SFE is the use of an air turbine handpiece during surgical the extraction of a mandibular third molar. Other conditions that do not develop due to dental treatments include traumatic intubation, mechanical ventilation, facial trauma, vomiting causing esophageal rupture, asthma exacerbation with alveolar rupture, intense Valsalva maneuver, and general anesthesia (15). Roccia et al. (16) showed that air can diffuse to the surrounding tissues from the defects in the paranasal sinuses with the increase in pressure in the upper respiratory tract. The authors also explained that the air follows the path of least resistance while spreading to the connective tissues.

SFE is a self-limiting complication, and usually conservative (antibiotic and observation,) management is required. However, an extensive SFE may need multiple stab incisions to allow air pressure to escape and decompress (17). The extensive SFE could also be fatal as the emphysema may spread to the lateral pharyngeal space and reach the mediastinum by dissecting the visceral space and causing pneumomediastinum (17,18). Fink et al. (19) described the development of emphysema following local anesthesia and optic neuropathy in which air bubbles form in the canalis opticus due to the pressure of SFE on the orbital tissues.

Occasionally, subcutaneous emphysema may cause cellulitis or necrotizing fasciitis (20). The rationale for antibiotic prescription is that air introduced subcutaneously could be nonsterile (6). Furthermore, some authors have applied corticosteroids to reduce edema in the treatment of SFE, but their benefit has not been proven. The management with %100 oxygen is useful for the replacement of the gas in facial planes (11). In the present case, antibiotic treatment was started, and the patient was followed up carefully. The crepitant pain and tenderness were observed, and periorbital ecchymoses were noted on the postoperative second day. No abscess formation was noted postoperatively.

In the oral and maxillofacial region, SFE is mostly encountered with air-turbine handpieces, surgical treatment, head and neck trauma, or infection. Shudo reported that the Valsalva maneuver

may be a causative factor of SFE after closure with BFP. Metin et al. (1) observed SFE after the patient sneezed, and air pressure might have entered the facial planes in the maxillary sinus. Nizar et al. (6) reported that after surgery, patients cleaning their throats with closed mouths may cause increased pressure in the paranasal sinuses. In the present case, SFE was observed after the patient tried to climb the stairs out of. The air pressure in the maxillary sinus probably increased when the patient breathed rapidly. Therefore, air might have entered the subcutaneous tissues.

The patient's cooperation with the postoperative instructions on sinus precautions is critical to inhibit SFE formation. SFE may be induced by the patient sneezing, coughing, avoiding gaping, blowing forcefully, and vomiting. Pipette use and smoking are also not allowed. Besides these precautions, medications such as antihistamines and nasal decongestants, which can reduce the patient's risk of sneezing, may be prescribed (6). Strenuous physical activity, which will increase intrasinusoidal pressure, should also be avoided (6).

CONCLUSION

BFP is frequently preferred to close the large OCA. An oral and maxillofacial surgeon should know the anatomy of the Bichat fat pad tissue very well, and should have a good grasp of the nature of complications. One of the rare complications of BFP is SFE. SFE is mostly benign and self-limiting, although in some cases it may be life-threatening. Conservative treatment with close follow-up is usually sufficient for the management of SFE.

Ethics

Informed Consent: Informed consent was obtained from the patient and the extraction was performed without using high-speed air turbine drills.

Footnotes

Authorship Contributions

Surgical and Medical Practices: E.B.Y., T.K., Concept: Y.K., Design: E.B.Y., T.K., Data Collection or Processing: E.B.Y., Y.K., Literature Search: T.K., Writing: T.K.

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REFERENCES

- Metin R, Tatli U. An unexpected complication after use of pedicled buccal fat pad for closure of oroantral fistulae: emphysema. *J Dent Oral Sci.* 2019;1-8. Available from: https://maplespub.com/article/An-Unexpected-Complication-after-Use-of-Pedicled-Buccal-Fat-Pad-for-Closure-of-Oroantral-Fistulae-Emphysema?utm_source=chatgpt.com
- Parvini P, Obreja K, Begic A, Schwarz F, Becker J, Sader R, et al. Decision-making in closure of oroantral communication and fistula. *Int J Implant Dent.* 2019; 5: 13.
- Emes Y, Aga U, Cesur A, Soluk-Tekkesin M, Aybar B, Alatli C. Primary closure of oroantral communication using pedicled buccal fat pad following maxillary cyst enucleation. *J Craniofac Surg.* 2018; 29: e131-3.
- Dym H, Wolf JC. Oroantral communication. *Oral Maxillofac Surg Clin North Am.* 2012; 24: 239-47.
- Daif ET. Long-term effectiveness of the pedicled buccal fat pad in the closure of a large oroantral fistula. *J Oral Maxillofac Surg.* 2016; 74: 1718-22.
- Nizar MAM, Nabil S. Facial emphysema following closure of oroantral fistulae. *Case Rep Dent.* 2021; 2021: 5001266.
- Park J, Chun BD, Kim UK, Choi NR, Choi HS, Hwang DS. Versatility of the pedicled buccal fat pad flap for the management of oroantral fistula: a retrospective study of 25 cases. *Maxillofac Plast Reconstr Surg.* 2019; 41: 50.
- Baumann A, Ewers R. Application of the buccal fat pad in oral reconstruction. *J Oral Maxillofac Surg.* 2000; 58: 389-92.
- Dolanmaz D, Tuz H, Bayraktar S, Metin M, Erdem E, Baykul T. Use of pedicled buccal fat pad in the closure of oroantral communication: analysis of 75 cases. *Quintessence Int.* 2004; 35: 241-6.
- Shudo A. Buccal abscess derived from subcutaneous emphysema caused by the Valsalva maneuver after oral surgery with pedicled buccal fat pad grafting. *Oral Surg.* 2021;14(4):371-7. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1111/ors.12590>
- Mascarenhas RJ. Management of subcutaneous facial emphysema secondary to a class V dental restoration. *Clin Case Rep.* 2019; 7: 1025-30.
- Brasileiro BF, Cortez AL, Asprino L, Passeri LA, De Moraes M, Mazzone R, et al. Traumatic subcutaneous emphysema of the face associated with paranasal sinus fractures: a prospective study. *J Oral Maxillofac Surg.* 2005; 63: 1080-7.
- Brzycki RM. Case report: subcutaneous emphysema and pneumomediastinum following dental extraction. *Clin Pract Cases Emerg Med.* 2021; 5: 58-61.
- Cuccia AM, Geraci A. Cervicofacial and mediastinal emphysema after dental extraction. *Dent Med Probl.* 2019; 56: 203-7.
- Durukan P, Salt O, Ozkan S, Durukan B, Kavalci C. Cervicofacial emphysema and pneumomediastinum after a high-speed air drill endodontic treatment procedure. *Am J Emerg Med.* 2012; 30: 2095.e3-6.
- Roccia F, Griffa A, Nasi A, Baragiotta N. Severe subcutaneous emphysema and pneumomediastinum associated with minor maxillofacial trauma. *J Craniofac Surg.* 2003; 14: 880-3.
- Tran Q, Mizumoto R, Mehanna D. Management of extensive surgical emphysema with subcutaneous drain: a case report. *Int J Surg Case Rep.* 2018; 44: 126-30.
- Balaji SM. Subcutaneous emphysema. *J Maxillofac Oral Surg.* 2015; 14: 515-7.
- Fink P, Doyle L. Progressive subcutaneous emphysema and compressive optic neuropathy following dental analgesia. *J Am Coll Emerg Physicians Open.* 2020; 1: 1278-80.
- McKenzie WS, Rosenberg M. Iatrogenic subcutaneous emphysema of dental and surgical origin: a literature review. *J Oral Maxillofac Surg.* 2009; 67: 1265-8.