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Treatment of Large Oroantral Fistula with Autologous Bone Graft : Case Report

Elshan Muradov[1], Mehmet Barış Şimşek[2]

[1] Elshan Muradov, Gazi University, Faculty of Dentistry, Department of Oral And Maxillofacial Surgery, Ankara, Turkey.

[2]Mehmet Barış Şimşek, Gazi University, Faculty of Dentistry, Department of Oral And Maxillofacial Surgery, Ankara, Turkey.

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Abstract

Oroantral comunications are known as pathological connections occuring between the oral cavity and maxillary sinus. Early treatment of this condition prevents the development of sinusitis and fistula, as well as the need for more complex methods of treating patients and the possibility of recurrence. We present a case of 65 year old male with oroantral fistula which was caused by right maxillary second molar extraction. The defect was closure by double-layered technique, which combined block graft and buccal advancement flap. In the 6th, 12 and 24 month follow up controls complete epithelization of operation site and new bone formation was observed.

1. Introduction

Oroantral fistula (OAF) is communication between the oral cavity and the maxillary sinus floor. The fistula is established for migration of the oral epithelium in the communication. (Scattarella, Ballini, Grassi, Carbonara, 2010). Maxillary upper molars extraction are most common etiologic factor. Other causes are dentoalveolar infection, cysts, tumours, osteonecrosis, trauma and dental implant failure in the atrophic posterior maxilla (Ahmed & Askar, 2011)

Communication is diagnosed during a clinical examination, performing a Valsalva maneuver, mechanical and water testing. Later symptoms also include leakage of purulent contents from the alveolus, epistaxis, speech and breathing disorders. Additional tests include radiographs (pantomographic, sinus PA) and computed tomography (Kapustecki, Niedzielska, Borgiel-Marek, Różanowski, 2016).

Numerous surgical methods have been described for treatment of oroantral communication. Buccal advancement flap, palatal rotational flap and buccal fat pad are the most commonly used techniques. However most of these techniques depend on soft tissue closure only without grafting the bony defect (Visscher, van Minnen & Bos, 2010). This procedure results in shallowing of vestibule and abnormal bone remodeling in the site of the oroantral defect which makes future prosthetic or implant and prosthetic treatment difficult or impossible (Michal et al., 2016).

Autogenous bone graft is considered the gold standard in grafting procedures. It provides osteogenic, osteoconductive and osteoinductive properties without any immune reaction. Autogenous bone grafting has some negative aspects include second surgical procedure for bone harvesting and donor site morbidity (Betz, 2002).

The aim of the present case report is to analyze the healing of OAF with the associated use of ramus block graft.

2. Case Report

We report a 65-years old male patient who was referred to our attention for the presence of sporadic intraoral drainage in posterior right maxilla. The complaints of the patient started 1 year ago after the extracted of the upper right first molar tooth. The dentist tried to close the oroantral fistula by prosthesis, but did not achieve successful results (Fig. 1). She was admitted to our clinic with complaints of oroantral fistula (Fig. 2).

Fig 1. Panaromic film of oroantral fistula

Closure of the oroantral communication was conducted under local anesthesia. The first stage involved the formation of a trapezoidal mucoperiosteal flap in the oral cavity vestibule, as well as revision and cleansing of the postextraction wound (Fig. 2). Then, measurements of the alveolar width in the transversal projection of alveolus and measurements of the average height of alveolar bone lamina from the side of the oral cavity vestibule and from the side of the palate were conducted intraoperatively.

The next stage depending on the cavity diameter involved collection of monocortical bone blocks from mandible oblique line with the use of piezoelectric knife (Fig.3). The bone blocks were shaped in a way which made it possible to wedge them in the cavity and tightly close the defect. The graft was stabilized using a titanium mini-plate (Fig.3). Sharp bone edges were smoothed. The graft and surrounding bone were covered with vestibule flap and sutured without tension (Fig.4).

The healing process of soft tissue in the postoperative area, temporary sensory disturbances, unveiling of the aggregating element, loss of graft stability, occurrence of a secondary oroantral fistula were also assessed.

***Corresponding author:** Elshan Muradov
e-mail address: dr.elshen.muradov@gmail.com

Figure 2. İntraoral view of fistula and trapazeoid incision

Figure 3. Harvested of block graft and fixing the autogenous graft with a mini plate

The follow-up was conducted 2 weeks after surgery and then again 3, 6 ,12 and 24 months after surgery. Mini-plate was removed at the end of the first year (Fig.5).

Radiological evaluation conducted after 12 and 24 months from the surgery indicated the presence of a non-resorbed bone graft and no inflammation within the maxillary sinus.

3. Discussion

Autogenous bone grafts are a golden standard of treating bone loss and defects. Experimental studies confirm that autogeneous bone graft assure more predictable results than xenogenous graft, in term of osteo-integration on the receiving site, in order to obtain the closure of oroantral communication , such as synthetic bone graft substitutes constitute a valid alternative to flap based techniques (Scattarella, Ballini, Grassi, Carbonara, Ciccolella, Dituri, 2010).

In the most of dental treatment bone is harvested intraorally from mental protuberance, mandible oblique line, post-molar area, anterior maxillary sinus wall, zygomaticoalveolar crest. The faults related to the collection of autogenous graft include: creation of another operating eld, bone weakening in the donor site, extension of the treatment duration (Visscher et al., 2010)

Figure 4. Closure of wound

***Corresponding author:** Elshan Muradov
e-mail address: dr.elshen.muradov@gmail.com

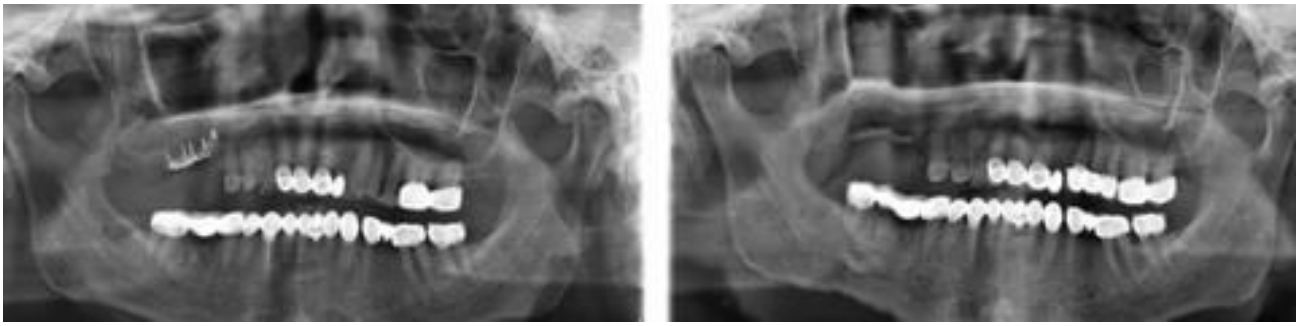

Figure 5. First month and first year panaromic films.

Proctor first described the bony closure of large OAF by grafting a piece of corticocancellous block from the anterior iliac spine. Complications associated with this technique are donor site morbidity and hospitalization. Haas et al. reported a case of bone reconstruction using autogenous impaction grafting. The grafts were harvested at the level of the mandibular symphysis. This allowed them to perform a sinus lift 3 months later as a part of an implant supported rehabilitation (Haas, Watzak, Baron, Tepper, Mailath, Watzek, 2003).

In our case, block graft was harvested from mandibular oblique line to close the fistula. The advantages of using mandibular bone grafts are related to using the same operation field easier accessibility reduced operating time, minimal post operative complaints and absence of visible scar. Furthermore operating exclusively inraorally is considered to be less extensive surgery by patients compared with using iliac crest as donor site. Mandibular symphysial corticocancellous graft considered to be an ideal graft because it provides a cortical portion for reconstructing a solid sinus floor as well as alveolar defect at the OAF site and its cancellous portion contains viable multipotent mesenchymal stem cells for osteogenesis. Several authors reported that membranous bone (oblique line bone graft) undergoes less resorption than bone of endochondral origin (iliac crest bone graft) owing to earlier revascularization of membranous bone grafts (Smith & Abramson M. 1974, Hoppenreijs, Nijdam & Freihofer, 1992).

These techniques, similar to the one that we reported, were innovative and successful for treating moderate to large OAF.

4. Conclusion

OAF should be treated by establishing a physical barrier to prevent infection of the maxillary sinus. This technique may be useful to treat OAF and to provide a solid alveolar bone site for subsequent prosthesis placement.

Conflicts of interest

The authors declare they have no conflict of interest.

***Corresponding author:** Elshan Muradov
e-mail address: dr.elshen.muradov@gmail.com

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***Corresponding author:** Elshan Muradov
e-mail address: dr.elshen.muradov@gmail.com