Global Journal of
Otolaryngology
ISSN 2474-7556

Juniper Publishers
key to the Researchers

Mini Review
Volume 6 Issue 3 – April 2017
DOI: 10.19080/GJO.2017.06.555689

Glob J Otolaryngol

Autogenous Closure of Oroantral Comunication: Different Surgical Approaches

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Submission: April 02, 2017; **Published:** April 07, 2017

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Abstract

Oralantral communication is a pathological communication between the oral cavity and maxillary sinus which may be due to iatrogenic complications or from dental infections, radiation therapy or trauma, Therefore it should be treated carefully depending on the main cause of communication.

Keywords: Buccal flap; Palatal flap; Graft

Introduction

Oroantral communication (OAC) is a pathological pathway between the oral cavity and the maxillary sinus. Extraction of maxillary posterior teeth is the most common cause of OAC. Maxillary cysts, benign or malignant tumors and trauma can be other causes of OAC [1]. OACs must be sealed in order to prevent the escape of fluids, other mouth contents, and oral bacteria into the maxillary sinus. So the ideal treatment following creation of an OAC is to perform immediate surgical repair. Early treatment of OAC is very important to prevent formation of an oroantral fistula (OAF), to avoid development of chronic maxillary sinusitis, and is associated with a higher success rate [2].

Immediate plastic surgery of the oroantral fistula is effective in 95 percent, while a postponed surgery only in 67 percent [3]. In the light of recent studies and opinions, an oroantral fistula should be closed in 24 hours. After this period, in approximately half of the patients intensified inflammatory changes make it impossible to effectively conduct the treatment [3,4]. It occurs sometimes that the oroantral communication especially of a small size (up to 5mm) undergoes spontaneous healing provided that the sinus and the clot filling the alveolus are clean. However, this is not a method recommended by clinicians [3,5,6]. Considering current opinions, each oroantral communication should be treated surgically after previous diagnostics which excludes the presence of a foreign body and/or inflammatory changes of mucous membrane. An undiagnosed oroantral communication or treatment of an oroantral communication followed by complications results in chronic maxillary sinusitis. Its treatment involves removal of the oroantral fistula, surgery of the maxillary sinus and closure of the oroantral defect [5-7].

Methodology

Autogenous Soft Tissue Flaps

The most common surgical treatment of an OAC is the buccal advancement flap procedure designed by Rehrmann [8]. In this procedure a broad-based trapezoid mucoperiosteal flap is created and sutured over the defect. Its broad base assures adequate blood supply. Consequently, high success percentages (93%) have been reported [9]. An alternative method for closure of OACs is the Môczáir flap [10]; this method involves a buccal muco-periosteal flap that is displaced 1 tooth width distally. The Môczáir flap is recommended for edentulous patients because the large denuded area, which is the result of the distal displacement of the buccal sliding flap, may give rise to periodontal disease in dentate patients. In addition, buccal sulcus depth is minimally influenced by advancement of the Môczáir flap in comparison with the Rehrmann method [11].

Full-thick-ness mucoperiosteal palatal flaps in various forms may especially be useful for closure of OACs larger than 10 mm [12]. A palatal flap, anteriorly based as described by Salins and Kishore [13] or posteriorly based, contains a large palatine vessel to ensure adequate blood flow. Itis less vulnerable to rupture than a buccal flap because of the thickness of the palatal

mucosa. Further- more, the buccal sulcus depth remains intact. The buccal fat pad (BFP) is a lobulated mass of fatty tissue surrounded by a slight capsule, located inside the masticatory spaces [14,15]. The size of the BFP has proved to be constant among individuals, regardless of the fat distribution and body weight [16]. Blood supply to the BFP depends on branches of the superficial-temporal, maxillary, and facial arteries. Its use as a pedicled graft for reconstruction in oral surgery, including the closure of OACs, was first described by Egyedi [17] in 1977. One of the advantages of the BFP is the proximity of the BFP near the recipient area, permitting quick grafting. Tongue flaps can be created from the ventral, dorsal, or lateral part of the tongue [18]. In general, the location of the defect dictates the choice of tongue flap. Especially the lateral tongue is suitable for closure of OACs [19].

Autogenous Bone Grafts

Proctor [20] first suggested bone grafts harvested from the iliac crest for closure of large OACs in 1969. Nevertheless, bone grafting for closure of OACs has the disadvantage of requiring a second surgical procedure for bone harvesting. Watzak et al. [21] harvested retromolar bone for pressfitted closure of OACs in 4 patients. After placing the bone graft, soft tissue closure was realized by a Rehrmann buccal flap. No reopening of the sinus was observed. Chin bone for oroantral fistula closure was studied in 5 patients by Haas et al. [21]. In 3 patients a stable press-fit of the bone graft in the OAC was accomplished. In 2 patients additional plates and screws were used to obtain a rigid fixation of the graft. A Rehrmann flap was used in all patients for soft tissue closure. Wound dehiscence occurred in 1 patient, but the sinus remained unaffected. The use of a monocortical (chin) bone block for closure of an OAC is recommended for patients affected by maxillary atrophy requiring sinus augmentation before implant placement [22]. Peñarrocha-Diago et al. [23] used zygomatic bone as a bone graft for closure of an OAC in 1 patient. Subsequently 2 dental implants were placed. This technique offers the advantage of the proximity of the donor area to the recipient area, which minimizes surgical time and patient discomfort [23]. As in retromolar bone grafts, limited bone is obtainable from the zygomatic process. Furthermore, accidental sinus membrane perforation may occur [23].

Discussion

Generally, autogenous treatment of OACs is mostly safe, well tolerated by patients, has low costs, and with good bony and soft tissue healing with a low complication rate although it needs good anatomical and surgical skills for the desired results.

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How to cite this article: Mohammad A H. Autogenous Closure of Oroantral Comunication: Different Surgical Approaches. Glob J Oto 2017; 6(3): 555689. DOI: 10.19080/GJO.2017.06.555689.

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