Management of Oro-antral Communication using Bichat’s Pedicled Buccal Fat Pad

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ABSTRACT

Oro-antral communication is a common complication of exodontia as well as trauma and pathology or may result during surgical procedures. It is therefore routinely encountered in the maxillofacial clinic and results in the inflammation of the sinus membrane and subsequent complaint of pain and pus discharge from the infected sinus cavity frequently appearing on the radiograph as an opacification of the sinus. Chronic cases may even be reporting with long-standing fistulas with complaints of nasal regurgitation and foul smell. History of trauma, surgery, or extraction is suggestive and adequate management is necessary to ensure patient well-being and rehabilitation. Presented here is a case report demonstrating successful surgical management and rehabilitation following the development of oro-antral communication in a 35-year-old female patient who had presented to the department with the chief complaint of pain and pus discharge since 2 months using pedicled buccal fat pad.

Keywords: Buccal fat pad, Caldwell Luc procedure, Fistula, Maxillary antrum, Oro-antral communication, Sliding flap.

INTRODUCTION

Oro-antral fistula may be the result of cysts, traumas, tumors, pathological entities, or even minor surgery. The term oro-antral fistula refers to a fistular canal covered with epithelia which may or may not be filled with granulation tissue or polyposis of the sinal mucous membrane, and despite its varying etiology, most frequently it occurs because of iatrogenic causes. The extraction of maxillary posterior teeth remains the most common cause of oro-antral communication (OAC), because of the anatomically close relationship between the root apices of the premolar and molar teeth and the maxillary antrum, and the thinness of the antral floor in that region, which ranges from 1 to 7 mm. The thus created communication may heal by spontaneous organization of the blood clot present within the socket lumen. However, upon expiration, the air current which passes from the sinus through the alveoli into the oral cavity facilitates the formation of a fistular canal and disrupts the organizing clot which connects the sinus with the oral cavity. With the presence of a fistula, the sinus is permanently open, which enables the passage of microflora from the oral cavity into the maxillary sinus and the occurrence of inflammation with all possible consequences. In one study, the incidence of oro-antral fistula was found to vary from 0.31 to 3.8% following simple extraction of maxillary teeth. An OAC of less than 2 mm in diameter tends to close spontaneously, whereas those larger than 3 mm require surgical closure. Various methods for the closure of communications have been reported in the literature, such as local flaps, distant flaps, grafts, and the buccal fat pad (BFP). Anatomically, second molar roots have the most intimate relationship with the maxillary antrum floor, followed by the first molar, third molar, second premolar, first premolar, and the canine.

CASE REPORT

A 35-year-old female patient presented to the department with complaints of persistent pain and pus discharge from the site of previously removed tooth in relation to her upper left back tooth since 2 months (Figs 1A to C). The history of the patient revealed that she had previously experienced pain in relation to the same tooth for which she was prescribed an intraoral periapical X-ray and was subsequently advised extraction following a course of antibiotics and analgesics. Following the extraction, from the 5th day onward, the patient developed symptoms similar in nature to those at presentation. However, during the course of a few weeks subsequent to the extraction, the patient developed pain, pus discharge, foul odor, and heaviness in relation to the front aspect of her left cheek. Mirror fogging test was found to be positive for the presence of OAC. An extraoral examination revealed tenderness over the left maxillary sinus area at the lateral aspect of nose. Intraoral examination revealed an unhealed socket in relation with erythematous granulation tissue at 16 region. Escaping of air bubbles was noted on
performing Valsalva maneuver. An orthopantomogram (OPG) radiograph along with paranasal sinus views were prescribed along with a 5-day course of empirical antibiotics with analgesics and nasal decongestants. The OPG revealed a communication extending from the apical region of the upper left first molar into the maxillary antrum and the sinus view revealed distinct opacification of the left maxillary sinus (Figs 2A and B). A diagnosis of OAC was made involving the left maxillary sinus extending from the apical region of 16. An excision of the fistulous tract along with closure using pedicled BFP was planned. An intraoral sulcular incision was made and a full thickness trapezoidal mucoperiosteal flap was raised extending from distal aspect of 14 to the distal aspect of 17. Fistulous tract was removed and defect exposed. Periosteum was then incised and encapsulated buccal pad of fat was then teased out and sutured over the defect using 4-0 round body vicryl (Figs 3A to C). Postoperative
antibiotics, analgesics, nasal decongestants, chlorhexidine mouthwash, and sinus instructions to avoid sneezing or blowing nose too forcefully were given to the patient. The patient was then followed up after 2 weeks demonstrating successful uptake and healing (Fig. 4). The patient was followed up for 6 months subsequently with uneventful healing and no complications whatsoever were noticed (Fig. 5).

DISCUSSION

Several techniques have been described in the literature for the closure of an OAC.7 When determining how to treat a communication, the surgeon should take into account its size, the presence or absence of infection, and the time elapsed since the onset/extraction until diagnosing the communication. The presence of maxillary sinusitis, epithelialization of the fistula tract, osteitis or osteomyelitis on fistula margins, a foreign body, dental cysts, a dental apical abscess, or tumors prevents spontaneous healing and results in chronic fistulas. Sinusitis will result as a result of a long-standing oroantral fistula, and it is important that it should be treated prior to proceeding with any attempts at surgical closure. Any foreign bodies, infected and degenerated polypoid mucosa, or infected bone should immediately be removed.

The incidence of OAC is higher after the third decade of life.8 This is attributed to the late pneumatization of the maxillary sinus consequently, causing it to attain its greatest size during the third decade of life. Some authors are of the opinion that buccal flap techniques are preferable for closure of smaller communications, while palatal flaps are better for larger bone defects.9 Anatomical location of the defect is to be taken into consideration prior to executing the formulated surgical treatment plan. When the defect is located in the third molar region, rotation of the overlying flap is hindered by the vascular pedicle. Although the surgical procedure is comparatively easier, buccal flap is not preferred owing to its comparatively poor perfusion. Furthermore, the buccal flap causes narrowing of the gingivobuccal sulcus, thereby interfering with prostodontic rehabilitation.10

A novel sandwich technique using layered apposition of the bio-oss bovine osseous graft with bio-guide porcine type I and III collagen membrane has been proposed. This is an advantageous technique in terms of time saving, cost, and, more importantly, less discomfort to the patient during and after surgery. Furthermore, both bony (hard tissue) and soft tissue closure is achieved for OAC in contrast to only soft tissue closure obtained by buccal sliding flap and palatal flaps. The reconstructed bony tissue regenerated from this technique will also be able to receive an endosseous implant.11

Another promising although classical surgical modality in the management of OACs remains closure with pedicled BFP. Since the first description of its application in 1977 by Egyedi,12 BFP has found increasingly greater applications in oral surgery. Originally described as an anatomic structure without any obvious function, it was for a long period even considered a surgical nuisance.13,14 However, during the past three decades, it has proved of value for the closure of OACs and has become a well-established tool in oral and maxillofacial surgery. The main advantages of the pedicled BFP flap for OAC closure are that it is a simple procedure; is widely applicable; the incidence of failure is low; the negative side effects are rarely seen and mostly temporary; the prosthetic rehabilitation is feasible without limitations; it has minimal donor site morbidity; its success is independent of patient age and general condition; and it can be used in association with other flaps as a second layer. Its main drawback is that it can only be used once and limitations exist concerning the potential size of the defects to be covered.15

Yet another technique for simultaneous closure of the fistula combined with an osseous rehabilitation of the intrabony defect at the affected site using autogenous corticocancellous block graft was proposed in 2003 by
Robert Haas et al\textsuperscript{16} Irregular bony defects of the sinus floor were first standardized to the smallest possible rounded shape using a trephine. A monocortical block graft was harvested at the donor site (chin) by using a suitably selected trephine with an inner diameter matching the size of the round bony defect (the defect size being evaluated prior to the commencement of the surgery on a preoperative computerized tomography scan); the graft was then press-fit into the defect. Miniplates (Leibinger, Freiburg, Germany) or screws were inserted for graft stabilization. Soft tissue closure was established by using a Rehrmann flap.\textsuperscript{17} The sutures were drawn 1 week after the surgical procedure. The miniplates were removed at the time of the scheduled sinus lifting (i.e., 3 months after the bony closure of the oro-antral fistula). Six to twelve months after the sinus closure procedure, the defect sites were evaluated to ascertain whether the surgical procedure was successful.

REFERENCES


