

# Surgical Closure of Oro-Antral Fistula (OAF) using Buccal Fat Pad Graft: A Case Report and Review of Literature

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## ABSTRACT

So many causes can lead to fistulas which can involve the nasal and antral cavities or even both. They may result from various entities such as pathological ones or secondary to removal of tumors or maxillary cysts. However, the main cause of oroantral fistula is the extraction of a maxillary molar or premolar. This is due to the close relationship between the apex of these teeth and the thinness of the antral floor. The aim of this paper is to report and describe the procedure used to close a late oroantral fistula using the pedicled buccal fat pad graft. A 30 year-old male patient, in good general health, was referred for the closure of a late oroantral communication. Upon clinical examination, an approximately 5 mm fistula was observed connecting the oral cavity to the left maxillary sinus. A surgical procedure was performed under local anesthesia in order to close the oroantral fistula with a buccal fat pad graft. The healing of the wound and closure of the defect was seen after 15-day postoperative period, with a complete epithelialization. The patient presented a complete healing of the fistula, with no complications one year post-operative follow-up. Grafting of the pedicled buccal fat pad is highly considered as an efficient, safe and alternative closure solution in case of a large oroantral fistula. Pedicled buccal fat pad grafting corrected the defect without generating any sequelae and/or risky postoperative discomfort to the patient.

**KEYWORDS:** Oroantral Fistula, Buccal Fat Pad.

## INTRODUCTION

Oroantral communications (OAC) represent one of the most common surgical complications of dental procedures.<sup>1,2</sup> An oroantral fistula is a pathological condition in which the oral and antral cavities have a permanent communication via a fibrous conjunctive tissue fistula coated by epithelium.<sup>3</sup> OACs 2 mm in diameter or smaller are likely to close spontaneously, without any surgical intervention. However, OACs 3 mm in diameter or larger, or OACs associated with maxillary or periodontal inflammation, may persist<sup>4</sup>, and surgical closure is recommended. Several techniques have been utilized for OAC closure, such as the use of mucoperiosteal flap techniques (vestibular, palatine, lingual or combined), bone grafts<sup>5</sup> or buccal fat pad grafts.<sup>6,7</sup>

The buccal fat pad (Bichat Ball) is made up of a central lipidic mass with four extensions (buccal, pterygoid, superficial and deep temporal), with a 10-mL volume and a thickness of 6 mm.<sup>8</sup> The buccal fat pad is encircled by a thin fibrous capsule.<sup>5</sup> Blood supply is provided by the vestibular and deep branches of the maxillary artery, the transverse facial branches of the superficial temporal artery and branches of the facial artery.<sup>6</sup>

The buccal fat pad structure can be used in order to correct several oral defects, such as fistulas and oroantral communications<sup>5,7</sup>; in reconstruction after tumor resection<sup>6</sup>; in rehabilitation of cleft patients<sup>9</sup>; in aesthetic corrections of the face; and in implant-graft coating.<sup>10</sup> The scope of defects that can be treated using the pedicled buccal fat pad flap varies depending on the patient's morphology, as this structure varies in dimension from one individual to another. Oral defect closure using the buccal fat graft has been increasingly employed because it is a fast surgical procedure, is relatively feasible to perform, has a high success rate<sup>11</sup>, and is able to cover defects of up to 60×50 mm.<sup>12,13</sup>

The major aim of this paper is to report a clinical case of closure of an oroantral fistula using pedicled buccal fat pad graft.

## CASE REPORT

A 30-year-old male patient, in good general health, referred to our Oral Surgery Department of the Consultation Center of Dental Treatment (CCDT) of Rabat, complaining of pain on the left hemiface and of persistence of non-healed orifice, and a liquid outflow

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through his nose and food inflow through the communication due to a superior left first molar extraction eight months before.

Clinical intra-oral examination revealed an approximately 5 mm fistula linking the oral cavity to the left maxillary sinus, with absence of pus and systemic inflammatory signs (Fig. 1).



Fig 1 : Intra-oral view showing the oro-antral fistula

The Panoramic Radiograph revealed a left bone defect in front of the extraction site, and also the presence of a perforation in the floor of the left maxillary sinus, which confirms the communication between the oral cavity and the left maxillary sinus. A blandeau Scan was performed and revealed the presence of left maxillary veiling sinus with a fault in its floor (Fig 2 & 3), leading it to the left chronic sinusitis diagnosis.

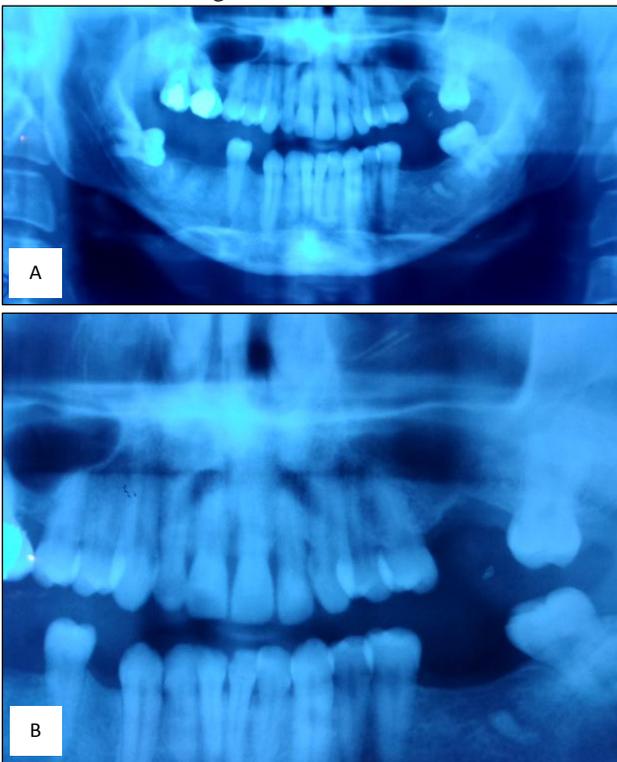


Fig 2 (A, B) : Panoramic X-Ray showing the bone defect in the previous extraction site leading to a perforation in the floor of the left maxillary sinus

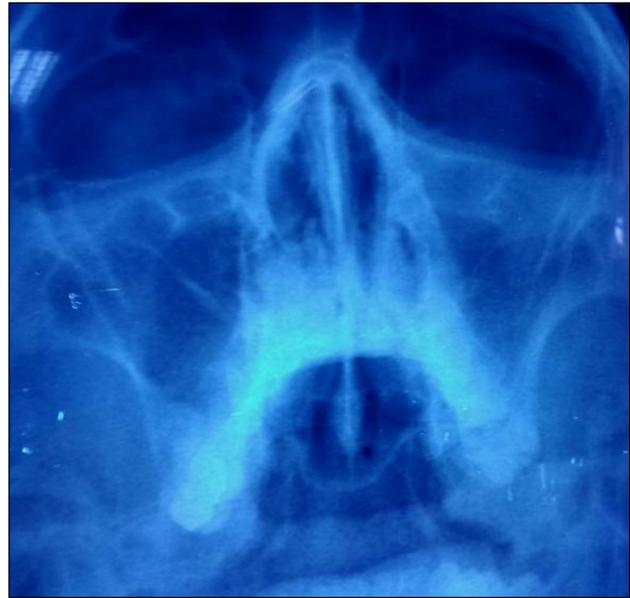


Fig 3 : Blandeau Scan revealing the presence of a left maxillary veiling sinus

Antibiotics medication have been used to manage the infection and to an eventual closing surgery using the buccal fat pad technique. After 7 days, the patient underwent a new evaluation, when he presented no signs of pus drainage in the fistula.

Under local anesthesia, the surgical procedure consisted on a crestal incision followed by a linear incision in the region of the left first superior molar to denude the periosteum and to let the buccal fat pad emerge. A longitudinal incision was performed later in order to better charge the flap and to ensure a better visibility of the fistula.

After raising the flap, the fistula's diameter seemed larger than its initial clinical dimension, about 6mm (Fig 4). The buccal fat pad was dragged into the fistula site completely covering the defect (Fig 4), then sutured with simple 3-0 silk thread stitches, without tension (Fig 5).



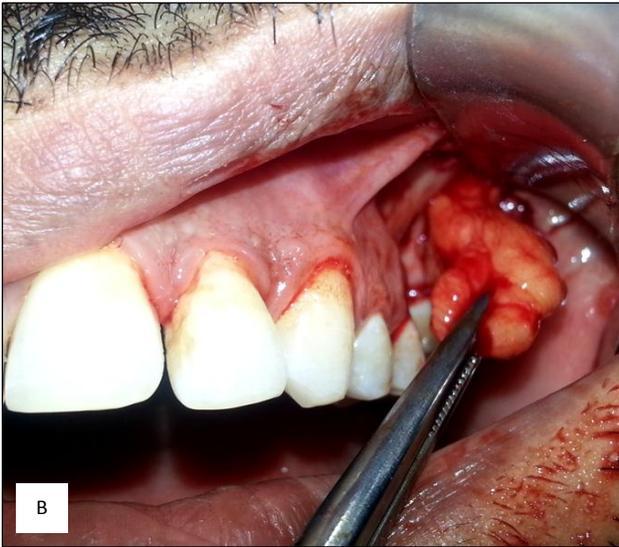


Fig 4 (A, B) : The buccal fat pad dragging into the fistula's site



Fig 7 : 6 Months later



Fig 5 : Post-operative Sutures

The suture was removed after a 15-day postoperative period without complications (Fig 6); the patient presented an advanced stage of proliferation of the epithelial tissue of the mucosa on the adipose tissue. Six months after surgery, the healing of the wound and the complete closure of the defect, which was completely epithelialized, could be noted (Fig7). The patient was

afterwards followed up over a period of one year and showed a complete healing of the wound, with no complications (Fig 8).



Fig 8 : 1 Year later



Fig 6 : 15 Days later

## DISCUSSION

OACs have different etiologies, one of the most frequent of which is the removal of the maxillary posterior teeth; the major cause of the communication reported in this clinical case. OACs must be performed as soon as possible to avoid sinus pathological conditions, which can prevent the treatment of the lesion and the resolution of the case. Treatment of OACs identified in early stages is based on a surgical procedure that provides convenient communication closure and which corrects patient instructions to avoid changes in pressure in the upper airways during the recovery period.<sup>14</sup> In cases when OAC is identified later, the initial procedure should be the analysis of the maxillary sinus to determine whether a sinus condition is associated with the communication. In this case, the infection must be resolved before any surgical procedure. To undertake the OAF closure, sinus

irrigation with saline plus antibiotic therapy should mandatory be performed.

The buccal flap technique can be successfully employed in the treatment of small and medium-sized communications, but its use is limited to conditions when the defect has been dislocated to the palatine area due to a greater buccal loss, which requires a greater flap sliding. The rotation of the palatal flap can also be used to solve important communications without harming the vestibular sulcus, although this procedure creates great morbidity due to the open area it creates in the palate. This open area demands a long postoperative care period, generating huge discomfort to the patient.

Pedicled buccal fat pad flaps have been recommended for the closure of fistulas and communications of varied sizes and locations; the use of pedicled buccal fat pad flaps has also been employed in the resolution of unsuccessful surgical cases in which lesions have developed. Advantages of this technique are the low morbidity rate, conservation of the vestibular sulcus depth, its high applicability, the low incidence of failure, and the great flap vascularization and size.<sup>7,15</sup> According to Hanazawa & al<sup>7</sup> when fat tissue is exposed to the oral environment, it gets epithelialized and is gradually replaced by fibrous conjunctive tissue within a 30-40-days postoperative period, without any functional damage to the treated site.<sup>16</sup>

The use of the pedicled buccal fat pad graft technique in the resolution of the case described was due to the lesion location on the vestibular sulcus of the left maxillary alveolar bone, which prevented the palatal rotating flap technique from being performed, as this would need a very large flap to cover the fistula. The location also explains the non-use of the buccal flap sliding technique, which would lead to vestibular sulcus depth loss.<sup>17</sup>

A factor highly considered in choosing the postoperative technique prognosis was the large communication size, which made the other previously mentioned techniques less suitable and favored the use of the buccal fat pad as a pedicled graft source for the lesion resolution. The surgery was performed without interurrences, and the lesion was coated by the graft with no difficulties. Discomfort during the recovery period was not reported by the patient.<sup>17,18</sup>

In the case reported, the pedicled buccal fat pad graft proved to be an easy, efficient and safe procedure for the immediate closure of the oroantral fistula, leading to the resolution of the defect without generating sequelae or excessive postoperative discomfort to the patient. The exposed fat tissue underwent a coating process by the normal surrounding mucosa in a short time in the postoperative period, resulting in the total regeneration of the treated area.<sup>18</sup>

## CONCLUSION

The treatment of oroantral fistula using the buccal fat pad graft is a simple and complete method which enables

several uses in most of the cases. The blood supply of buccal fat pad is absolutely not affected due to its displacement, once it is gripped and replaced between the flap and the maxillary wall. The reported case had no complications and the fistula was completely cured.

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