


## Treatment of oroantral fistula: case report

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### Abstract:

The oroantral fistula is a pathological communication between the oral cavity and the maxillary sinus that is covered with epithelial tissue from both sites. It may be caused by dental infections, surgical iatrogenesis, radiotherapy or trauma. To avoid contamination of the maxillary antrum, this connection must be closed. Several tissue flaps may be used for this. The aim of this paper is to present a case of oroantral fistula treatment in the posterior region of the left maxilla using a vestibular sliding strip flap with palatal interposition. A 54-year-old female patient was presented with an oroantral fistula confirmed by the Valsalva maneuver and radiographic examination. The patient was previously exposed to antimicrobial treatment in order to solve the acute infectious disease, which was accompanied by surgical closure. Dehiscence and drainage via fistula in the postoperative period motivated the performance of a second surgical procedure using a sliding vestibular flap with palatal interposition. It is concluded that infection prevention is important for the effectiveness of treatment, as well as patient's cooperation in the postoperative period.

**Keywords:** Oral surgery; operative surgical procedures, maxillary sinus

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## INTRODUCTION

The oroantral fistula is a pathological communication between the oral cavity and the maxillary sinus with several causes, including trauma, dental infection, osteomyelitis, radiation therapy and extraction of upper molars. This last cause is the most frequently seen due to the anatomical position of the apex root with the maxillary sinus floor<sup>1,2,3</sup>. This communication is more common between 30 and 60 years old. It is more prevalent in men than in women<sup>4</sup>, due to the greater number of extractions in this group of patients<sup>5</sup>.

The diagnosis of this pathological condition can be performed by Valsalva maneuver, which consists of a moderate forceful attempted exhalation against the maxillary sinus. It is made by pressing the nostrils together to occlude the nose and telling the patient to breath gently through the nose while the surgeon observes whether there is air passage from the maxillary sinus to the oral cavity<sup>6,7,8</sup>.

Radiographic exams can be used as diagnostic complement. The panoramic radiography may be useful to provide a screening in order to identify aspects evidencing the presence of fistula, such as discontinuity of the sinus floor, increase in the radiopacity, besides to allow a comparison between the maxillary sinuses<sup>4</sup>. In addition, radiography with Waters view provides a more accurate information regarding the extension and limits of the communication<sup>6,9,7</sup>.

The treatment of closing communication must be managed to prevent food and saliva contamination, which can lead to bacterial infection, impaired healing, and chronic sinusitis<sup>7,10</sup>. However, its size and the occurrence of active infection need to be previously determined, since the effectiveness of treatment depends on the sinus health<sup>6,2,8</sup>. Several flaps are reported in literature to close the oroantral fistula and all of them present both advantages and limitations. However, the buccal and palatine flaps, as well as Bichat buccal fat pad are the most commonly described<sup>11,12,13,14</sup>.

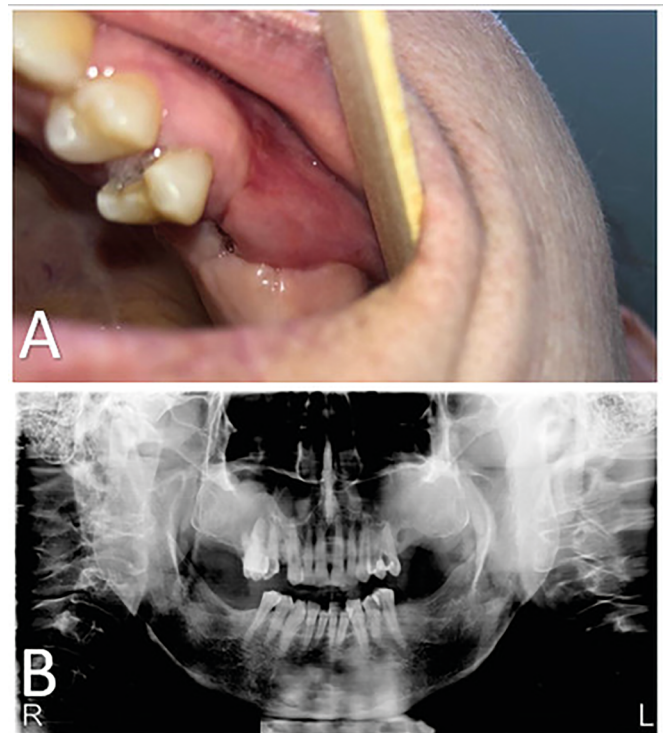
Based on the need to understand the treatment of the oroantral fistula and its possible consequences, the aim of this study is to report a case report of a 54-year-old female patient who was presented with a oroantral fistula in the posterior region of the left maxilla and was treated with a vestibular sliding strip flap with palatal interposition.

## CASE REPORT

A 54-year-old female patient was referred to the Oral Pathology and Oral and Maxillofacial Surgery Departments of the University Hospital João de Barros Barreto for the treatment of a fistula presented four years after extraction of the left maxillary second molar. The patient reported a previous history of two attempts to close the oroantral communication. However, both were unsuccessful and the last was performed two months ago, leading to the development of a recurrent sinusitis.

Under clinical examination, it was noted a fistula linking the oral cavity with maxillary sinus in the region of the left upper maxilla, in the same site of the left maxillary second molar (Figure 1A). The Valsalva maneuver was performed to confirm the diagnosis, and the radiographic examination revealed a bone defect measuring 19mm in the mesio-distal and 12mm in the vestibulo-lingual directions (Figure 1B).

Preoperative antimicrobial therapy was started with amoxicillin 500 mg and clavulanic acid 125 mg for



**Figure 1.** Initial clinical aspect and panoramic radiography. A) The patient was presented with a fistula linking the oral cavity with maxillary sinus in the region of the left upper maxilla, in the same site of the left maxillary second molar. B) Radiographic aspect showing opacification of the maxillary sinus on the left, and bone defect measuring 19mm in the mesio-distal direction and 12mm in the vestibulo-lingual direction.

07 days to control the acute infectious process. After remission of signs and symptoms, surgery was scheduled using the vestibular advancement flap and Bichat buccal fat pad.

The first surgical procedure was performed under local anesthesia to cover the exposed bone defect. Postoperatively, amoxicillin 500 mg and clavulanic acid 125 mg for 07 days was maintained, and was supplemented with nimesulide 100 mg and dipyron 1g for inflammatory and pain control. The patient received postoperative instruction, and was advised not to smoke, not to blow her nose, not to sneeze with her mouth closed, or to perform any operation that favored the differential in pressure between the oral cavity and the sinus. There was good healing at the site during the 7-day postoperative period, although a slight dehiscence in the suture region in the attached gingiva, but with no sign of buccosinus communication. Due to a coughing condition, the patient developed a dehiscence of the injury 14 days after surgery. Therefore, amoxicillin 500 mg and clavulanic acid 125mg were prescribed for more 7 days and general care was again instructed.

A second surgery was performed, where a sliding vestibular flip flap was made and an envelope was created in the palatal region to cover the flap margins (Figure 2A-B). In the postoperative period, the same drugs were maintained for pain control and infection prevention, as well as being informed about the general and specific care inherent to the procedure realized. The patient

returned after 7 days to remove the suture and presence of infectious process or dehiscence of the affected region was not noted (Figure 2C). In the 14-day postoperative period, the patient returned with a clearly achieved healing process (Figure 2D). Actually, the patient is in a 14-month follow-up period with no signs of recurrence.

## DISCUSSION

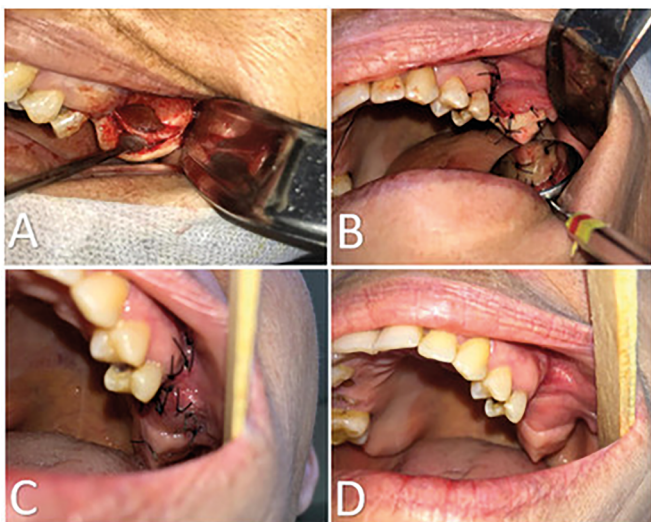
Previous literature have described certain conditions associated with predisposition to the occurrence of oroantral communication after tooth extractions, such as pneumatized maxillary sinus with little alveolar bone remaining and presence of divergent dental roots<sup>6,4,15</sup>. The extraction of molars and premolars is often associated with oroantral fistula<sup>1,16</sup>. According to Galli et al.<sup>11</sup> and Juno et al.<sup>2</sup>, the second premolars and first molars are more linked to this condition, which can be confirmed in the present case report. Madeira<sup>17</sup> states that, anatomically, the root apexes of the second molars are closer to the maxillary sinus and, indeed, contribute to the oroantral communication.

The radiographic aspects correspond to a radiolucent area and be delineated in all peripheral areas by a well demarcated layer of cortical bone<sup>6,9</sup>. In the present case, the opacification and discontinuity of the sinus floor were noted, corroborating with previous literature. As mentioned by Borgonovo et al.<sup>18</sup>, these aspects are suggestive of the presence of communication associated with sinus infection<sup>19,15</sup>.

The passage of air and fluids between the nose and the mouth are clinical findings of the presence of oroantral fistula. According to Kwon et al.<sup>8</sup>, the patient can report symptoms such as bad taste and smell, pain in the affected region and reflux of food from the nose to the oral cavity. Sinusitis caused by sinus infection was also exposed by Khandelwal and Hajira<sup>1</sup>. Other authors mentioned unilateral nasal obstruction and nocturnal cough due to drainage of exudate into the pharynx<sup>9,20</sup>.

According to Hupp et al.<sup>6</sup>, antibiotics that are effective against odontogenic infections, including penicillin, clavulanic acid, clindamycin and metronidazole, are also effective against odontogenic sinusitis<sup>7,8</sup>.

The literature reports on the principles for making vestibular advancement flaps, including the elevation of a wide base flap with adequate width to cover the defect<sup>1,6,19</sup>. Some authors argue that their margins should be positioned on the healthy bone instead of being placed directly on the communication area<sup>6</sup> and that it is free of any tension decreasing the possibility of necrosis<sup>9,13,18</sup>.



**Figure 2.** Transurgical procedure and follow-up. A) Exposure of the maxillary sinus. B) Immediate appearance of the postoperative period showing the sliding vestibular flip flap with palatal interposition. C) Appearance of the flap 7 days after surgery, showing no dehiscence or infectious process. D) A 14-day postoperative period showing the healing achieved.

The Bichat buccal fat pad is recommended as the flap when the communication is greater or equal to 3 mm<sup>4</sup>, consistent with the present case which showed satisfactory result with the technique. The advantages of this flap include a rich vascularization that favors the successful use of the adipose body as a pedicled flap, it is closed to the site of surgical correction, make a faster surgical procedure and low-cost showing good success rates<sup>14,16,21,22,23,24</sup>. Colella et al.<sup>25</sup> argues that it is not necessary to cover the flap with epithelial tissue because a granulation tissue is formed which is replaced by paraqueratinized stratified squamous epithelium. However, studies show that the disadvantages include the possibility of trismus in the postoperative period, the fact that it can only be used once and does not offer rigid support, since no bone basis is present<sup>2,9,18,20,26</sup>.

The vestibular flap is defended by some authors as ideal for closing small defects, when the alveolar ridge is very reabsorbed and the location of the fistula tend to be presented in mesial region<sup>5,27</sup>. Borgonovo et al.<sup>18</sup> declares that in larger defects, this flap can be combined with the palatal flap because it is an easily distended tissue, and it presents a simple surgical technique, also demonstrating positive results<sup>4,20</sup>. However, it causes loss of the bone remaining, which makes difficult the prosthetic rehabilitation in the affected patients<sup>8,15</sup>.

Patients must have attention in the postoperative process since the complete healing depends on patient's care. Parvini et al.<sup>5</sup> reported the need for oral hygiene, a diet with light foods and, mainly, avoid blowing and smoking<sup>11,19</sup>. In the present clinical report, it was found that the patient's non-adherence to personal care increased dehiscence in the first postoperative period, which favored the first procedure failure and motivated the second surgery.

According to Hupp et al.<sup>6</sup>, the best treatment for the oroantral fistula is to prevent the occurrence of this pathology. It is necessary a good treatment plan, detailed evaluation of the radiographs to check the condition of the sinus and if the tooth to be extracted presents any condition which may cause oroantral communication. One way to decrease the possibility of this condition occurring is the section of the roots<sup>4</sup>.

## CONCLUSION

The oroantral fistula is a pathological communication between the oral cavity and the maxillary sinus. There are several techniques well-documented in the literature for the treatment. In this clinical case, the use

of sliding vestibular flap with palatal interposition proved to be viable for the correction of large defects. The infection control, through patient's collaboration in postoperative, it is essential to avoid new procedures.

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