

Odontogenic maxillary sinusitis with oro-nasal fistula: a case report

Fabrizio Carini MD, DDS¹
 Salvatore Longoni MD, DMD, DDS¹
 Ernesto Amosso DMD¹
 Stefania Carini MS-6²
 Werner Garavello MD³
 Gianluca Porcaro DMD, DDS¹

¹ Department of Surgery and Translational Medicine, University of Milano-Bicocca, Monza, Italy

² School of Medicine, University of Milan-Bicocca, Monza, Italy

³ Clinica Otorinolaringoiatrica, Department of Surgery and Translational Medicine, University of Milano-Bicocca, Monza, Italy

Corresponding author:

Gianluca Porcaro
 School of Oral Surgery
 University of Milan-Bicocca,
 via Pergolesi 33
 20900 Monza, Italy
 E-mail: gianluca.porcaro@unimib.it

Summary

Aim of the study. The odontogenic sinusitis has an incidence between 38 and 40.6%. Increased risk of maxillary sinusitis has been reported with the presence of periapical abscesses, periodontal disease, dental trauma, tooth extraction and implant placement when the sinus membrane is perforated.

Materials and methods. A patient with odontogenic maxillary sinusitis associated with oro-nasal fistula was treated.

Results. The follow-up at six months showed the complete resolution of maxillary sinusitis, palatal fistula got closed and pain symptoms disappeared.

Conclusion. This case report describes a rare complication of odontogenic maxillary sinusitis: the oro-nasal fistula.

Key words: oro-nasal fistula, oro-antral fistula, maxillary sinusitis, odontogenic sinusitis.

Introduction

Maxillary sinusitis is one of the most frequent form of paranasal sinusitis. It is commonly divided into acute, subacute and chronic type (1,2). In acute sinusitis

symptoms persist for 4 weeks. Sinusitis is defined chronic when symptoms persist more than 12 weeks (3). The treatment of the two forms is different because acute sinusitis has a viral etiology, occasionally complicated by bacterial infection; otherwise, chronic sinusitis has always a bacterial etiology. For these reasons the use of antibiotic therapy is indicated in all cases of chronic sinusitis and in acute cases only when it is assessed a nasopharyngeal bacterial etiology (4). The literature reports the use of ciprofloxacin or amoxicillin with clavulanic acid to resolve the painful symptoms, because this treatment reduces the bacterial load and the related mucosal inflammation (5,6). If the patient is refractory to this therapy, macrolide antibiotics (7) are normally used. This type of therapy improves the ciliary movement, reduces secretions and increases the recruitment of mucosal immunity cells delegated to the mechanisms of apoptosis (7). Among the various forms of sinusitis, the most common is certainly the odontogenic form (38 to 40.6%), because the roots of premolars and molars are very close to the sinus membrane (8). Normally, radicular apices are located away from sinus structure, but sometimes they are separated by a very thin muco-periosteal membrane. For this reason, maxillary dental inflammation can lead to a great diffusion also in the sinus (9,10). Increased risk of maxillary sinusitis has been reported with the presence of periapical abscesses, periodontal disease, dental trauma, tooth extraction and placement of implants, especially when the Schneiderian membrane is perforated (11). In the literature (12) sinusitis is also frequently associated with cleft and lip palate. The patients often present symptoms of chronic sinusitis as well as pain associated with the involved tooth (13). An early clinical and radiographic diagnosis is essential because if sinusitis becomes chronic, it could change important functions of the Schneiderian membrane causing serious complications (14). The diagnosis can not be based exclusively on the use of bitewings, orthopantomography, or specific projections such as Water's projection, because these imaging techniques do not show the actual extension of sinusitis (15). In the same way, periapical radiographs, commonly used for the diagnosis of endodontic pathology, cannot document the presence of oro-antral communications (16). Recent advances in oral and maxillofacial surgery have provided dentists with information that was unavailable more than a decade ago. Cone-beam volumetric computerized tomography (CBVCT) is a new technique that produces three-dimensional images at reduced radiation doses than conventional computerized tomography (CT) (17).

Case Report

The patient N.F., 38 years old, presented herself at the Dental Clinic, San Gerardo Hospital, Monza. By extraoral physical examination, the patient had a painful swelling in the left infraorbital site. The suspicion of maxillary sinusitis was confirmed by palpation of the trigger point, because the patient felt a strong pain; the patient reported also nasal obstruction, rhinorrhea and regurgitation of fluids into the nasal cavity. By intraoral examination a nose-palatal fistula 2 mm large with purulent material could be observed (Fig. 1); since the vitality tests (cold test and cavity test) were positive to element 26, we suspected an involvement of this tooth in the inflammatory process of the sinus. The orthopantomography and multislice CT images confirmed the diagnosis of left maxillary sinusitis associated with oro-nasal fistula of odontogenic origin (Fig. 2). The patient reported that she had been submitted to different cyclic antibiotic therapy without any improvement of the lesion and symptoms. This case required antibiotic therapy with amoxicillin and clavulanic acid 875 mg + 125 mg, one tablet every 12 hours starting 48 hours before surgery. The patient was informed and prepared for surgery. First, plexus anesthesia with articaine 1:100.000 was performed. Thereafter, a muco-periosteal flap was drawn to open the surgical area and the surgeon performed an atraumatic extraction (Fig. 3). Periosteal releases of the buccal part were performed to obtain the closure of the flap by primary intention. This passage was made to avoid the risk of oro-antral communication. Then the surgeon applied a horizontal mattress suture with absorbable synthetic thread 4/0. The patient was in-

formed on drug therapy with postoperative antibiotics (amoxicillin and clavulanic acid 875 mg + 125 mg, one tablet every 12 hours for 7 days) and analgesic therapy. The patient was re-evaluated with follow-up at 7, 15 and 30 days, three months, and six months. She reported an improvement in pain symptoms and a decrease in inflammation and edema. The sutures were removed 15 days after surgery to avoid the risk of oro-antral communication (Fig. 4). The patient was clinically evaluated 30 and 120 days after surgery and an improvement was recorded in the state of the palatal fistula and absence of suppuration and rhinorrhea. The clinical follow-up (Fig. 5) and a post-surgery CBCT at 6 months (Fig. 6), showed the complete resolution of maxillary sinusitis and the oro-nasal fistula got closed.

Discussion and conclusion

Because of their anatomical location, the maxillary sinuses, may be easily invaded by microorganisms from

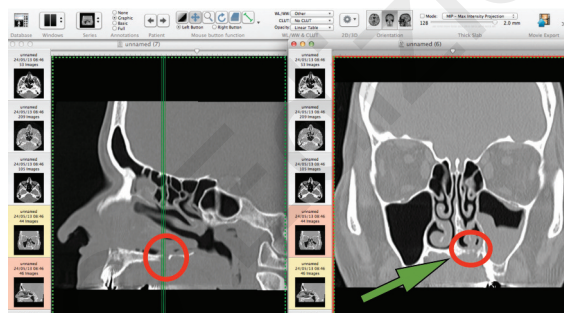


Figure 1. Radiographic pre-operative images (CBCT). On the left image the green line goes through the oro-nasal fistula (red ring) and the corresponding image on the right identifies the palatal root of the 26 (green arrow).



Figure 2. Clinical pre-operative images. Occlusal view evidence the oro-nasal fistula (red ring).

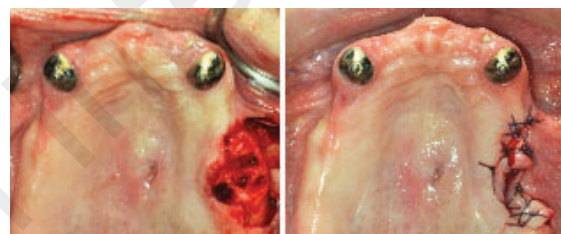


Figure 3. Clinical intra-operative images. Post-extraction (left) and post periosteal release flaps and suturing (right).



Figures 4, 5. Clinical post-operative image after 15 days (left) and clinical image after 6 months follow-up (right).

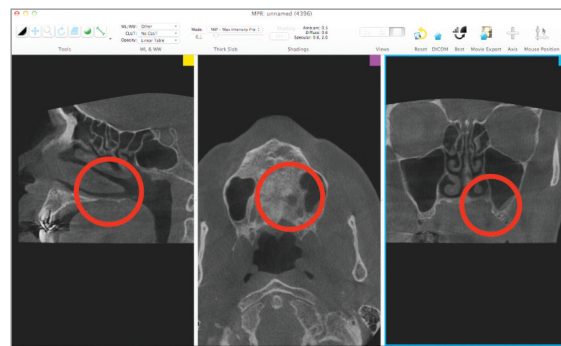


Figure 6. Post-operative radiographic images (CBCT) after 6 months.

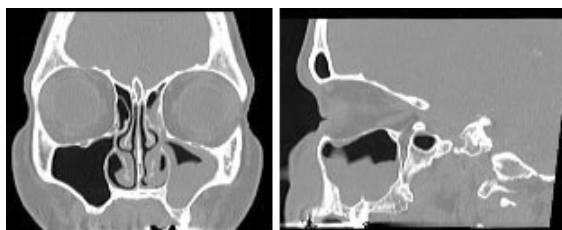


Figure 7. Pre-operative radiographic images. Fluid levels are more than two-thirds of the standard volume, suggesting an odontogenic etiology.

the oral cavity (18). A recent retrospective study on the diagnosis of acute maxillary sinusitis with CT showed a correlation between the levels of fluids as seen on axial images and the presence of odontogenic infection (1). The identification of odontogenic infection was based on three radiographic features: 1) projecting root of a tooth in the sinus, 2) periapical abscess, and 3) oro-antral fistula. The incidence was 17% when the sinus had a fluid level of less than one-third of its volume, markedly increasing to 79% when the fluid level increased to more than two-thirds. Maxillary sinuses with more than two-thirds fluid presence and mucosal thickening had identifiable dental sources in 86% of cases (Fig. 7). The presence of these radiographic features was very clear in the pre-operative CT scan of the patient (Fig. 7); the oro-antral communication created between the sinus mucosa and the apex of the non-vital tooth caused the passage of anaerobic bacteria in the sinus. This would be the "primum movens" of odontogenic sinusitis. The treatment of odontogenic sinusitis can not be reduced only to medical therapy, as was previously indicated to the patient. The correct therapy consists in large-spectrum antibiotics such as amoxicillin or clindamycin (because the infection's bacteria are part of the normal nasopharyngeal flora) (19) and it must be associated with a surgical treatment. For a successful outcome, it is therefore very important to remove completely the cause of the odontogenic sinusitis (20). For the management of the oro-nasal fistula various techniques and therapeutic alternatives have been reported in the literature that were related to the diameter of this communication. Nose-palatine communication with a diameter less than 2 mm is not treated because a spontaneous re-epithelialization can be expected. Communications between 2 and 5 mm are closed by first intention and fistulas larger than 5 mm are treated with flaps (21). The oro-nasal fistula arising from an odontogenic maxillary sinusitis, as described in this case report, is a rare complication.

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