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Maxillary Sinusitis of Dental Origin. A Case Report and Literature Review

Sinusitis Maxilar de Origen Dentario, Reporte de un Caso y Revisión de la Literatura

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ABSTRACT: The inflammatory lesions that affect the paranasal sinuses receive the generic denomination sinusitis; the maxillary sinus is the most commonly affected. This inflammation can have various origins, including the tooth. We describe a case of maxillary sinusitis in a 56-year-old patient who experienced pain on the left-side maxilla, referred to a tooth and performed a partial review of the literature.

KEY WORDS: sinusitis, maxillary sinus, dental origin, i-CAT.

INTRODUCTION

The maxillary sinus is an inflammatory and/or infectious process originating by bacterial, fungal, or viral infection developed in the maxillary sinus. It can be presented in isolation or associated with processes that affect one or more adjacent sinuses (Guiliand & Laurent, 2005). The maxillary sinus belonging to the nasal and oral cavity is the most susceptible of the all sinus to the invasion by pathogenic bacteria, either through their communication with the nasal cavity, or the product of odontogenic infection. (Brook, 2006) established their home via nasal (rinogenic), allergic, or tooth route.

Of the total cases of maxillary sinusitis, approximately 10–12% is exclusively sinusitis of the home tooth (Brook, 2006; Costa *et al*. 2007). The close relationship between the roots of the maxillary posterior teeth and the floor of the sinus makes the infection in these pieces directly affect the integrity sinus. Here are five ways that allow the injury of the maxillary sinus: 1) Periapical granuloma, which produces the effect of infectious core areas of the sinus; 2) Instruments beyond the apex via dental canal; 3) Marginal, by periodontal disease; 4) Apical lesion, granuloma, osteitis, or cyst; and 5) Surgery, for drilling and bucosinusal communication.

It has been shown that the closer the apex of a tooth to the floor of the maxillary sinus, greater is the impact on the antral tissues (Selden, 1999), this being the most important cause of the infections of periapical and periodontal origin (Cohen & Rockaway, 1957), along with accidents in the process of extraction of teeth (Uckan & Buchbinder, 2003).

The relationship with the antral tooth of the maxillary sinus floor under normal conditions is established through a thin layer of compact bone which gives the one hand supporting the fibers of the apical periodontal ligament that acceding to her firmly and the other is related with the so lax mucosa of the maxillary sinus. The inner lining of the sinus cavity lacks periosteum, so the solution of continuity on the floor of the maxillary sinus is in contact with periodontal tissues basal surface of the sinus mucosa, and this occurs in the presence of apical lesions (especially acute) in which osteolytic mechanisms are involved.

Maxillary sinusitis of dental origin with radiographic signs are characterized by an alteration in tooth pulp whose apex is approaching the floor of the maxillary sinus, apical lesion, radiographic loss of cortical bone which sets the lower limit of maxillary

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sinus, thickening of the membrane of the sinus space located on the sinus cusp (representing a swelling and thickening of the lining of the sinus), and various sinus space radiopaque degrees (often useful in comparison with the contralateral sinus) (Selden).

Patients who come to the dental office may initially present conditions such as periapical abscess, periodontal infection, deep cavities in teeth in posterior maxillary, or a recent extraction. (Kretzschmar & Kretzschmar, 2003).

Their treatment should be focused on dental pathology and treatment of sinusitis (Costa et al.). The elimination of the source of infection, such as the removal of a tooth root of the sinus cavity, the treatment of the ducts, or the extraction of tooth, is needed to prevent the recurrence of sinusitis (Brook, 2005).

We present a case of maxillary sinusitis of dental origin with a review of the literature, where the imaging examinations were crucial to the research on this disease.

CASE REPORT

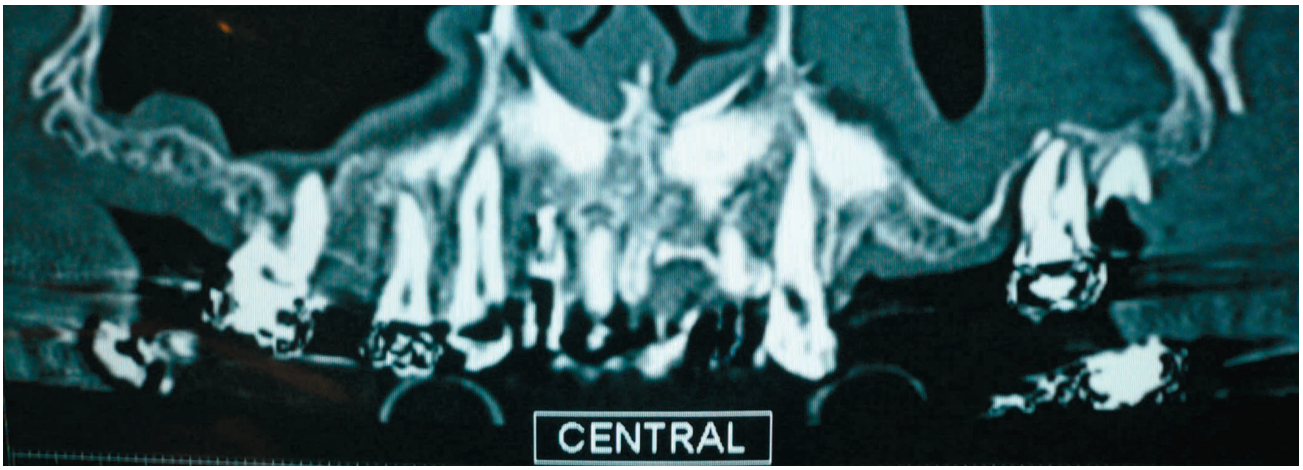
A 56-year-old male patient with no reported medical background of general importance, visits a dentist with pain in the posterior left maxillary area referred to as the piece 2.7, and irradiates toward the area of the same side of the cheek and feeling pressure in the area, along with recurrent headaches. On clinical examination, it is observed that there is no increase in the volume of the surrounding tissue, and no pain is reported on palpation of the area. The piece 2.7 presents mild pain on palpation and percussion, along with grade I mobility of the piece. The patient reported having received endodontic treatment three years ago. Radiographic examination was conducted by orthopantomography (Fig. 1) which is evident in the piece 2.7 (endodontically treated) with total vertical marginal bony rate in mesial and thickening of the distal periodontal space. Alveolar extension of the maxillary sinus with cupular image radiopaque is observed by the thickening of sinus mucosa in relation to apexes of the 2.7 and 2.8 pieces. Piece 2.8 to the state of the root with apical periodontal space is thickened.

A complementary imagenologic study was conducted with i-CAT scanner (Fig. 2). It was found in a central vision that there was a thickening of the membrane of the left maxillary sinus with a solution, and continuity in the cortical sinus in relation to 2.7 and 2.8 in the posterior area of the maxillary sinus floor, establishing a communication with the mesiovestibular root of 2.7. From a 3D lateral reconstruction of the left maxillary area, no sign of destruction of the wall above the jaw bone is observed (Fig. 3). By taking note of an area of the coronal maxillar CT (Fig. 4) one can discuss the extension of the lesion in the sinus, and observe at different levels a mass of soft tissue in the large left sinus, which almost completely covers the light, leaving a sinus cavity lumen sinus small.

According to the clinical and imaging features, an existence of left maxillary chronic sinusitis was diagnosed.

The patient underwent the surgery for the injury in the Hospital Base de Curicó by a medical team headed by an otolaryngologist and a maxillofacial surgeon. It was further established that an antibiotic treatment is to be given for a period of 30 days. The patient made satisfactory progress after the surgery, and the pain completely subsided.

Fig. 1. Orthopantomography in which one sees the 2.7 tooth with a treatment of conduct, periodontal commitment, in relation to the cortex of the left maxillary sinus floor. Radiopaque copular images are observed in relation to this sinus.



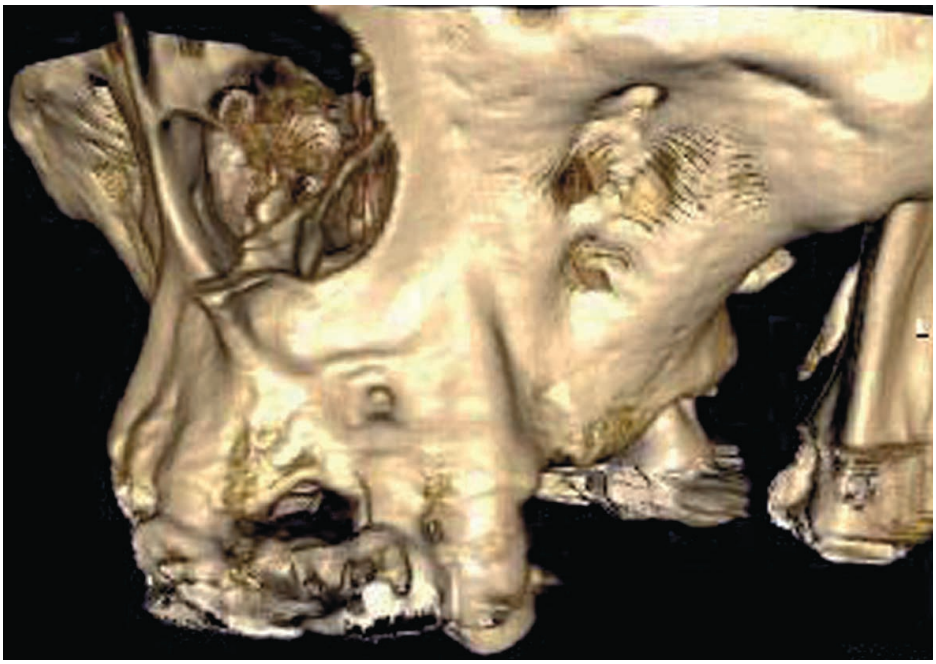


Fig. 2. Imagenologyc study with i-CAT where there is thickening of the membrane of the left maxillary sinus and a solution of continuity in the cortical sinus in relation to 2.7 and 2.8.

Fig. 3. Three-dimensional reconstruction, lateral view of the left maxillary area, where there is no sign of destruction of the wall in maxillary bone.

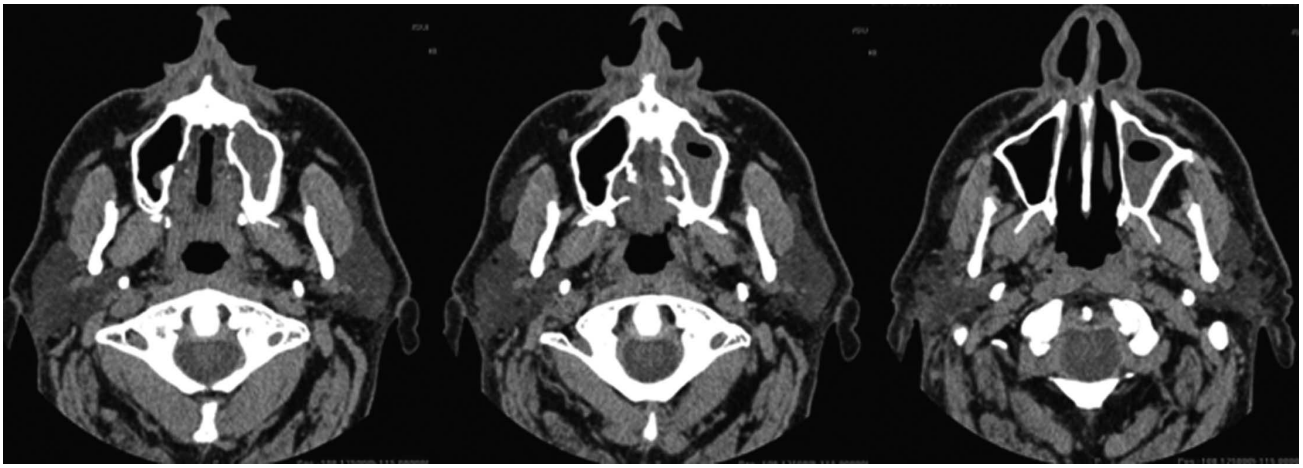


Fig. 4. Coronal head CT where there is a mass at different levels of inflammatory sinus vastness in leaving a lumen left sinus cavity small.

DISCUSSION

The sinusitis is classified by the intensity of the inflammatory process, analyses of the symptoms, signs, and course of the disease. They are acute sinusitis, subacute sinusitis, recurrent acute sinusitis, and chronic sinusitis (Kretzschmar & Kretzschmar).

In our report, we present a case of chronic maxillary sinusitis of dental origin, characterized by a symptomatology of something fuzzy (Wurzel, 1943), unlike an acute dental process where the examination produces a more conclusive evidence of any event that could have caused the injury (a complication of extraction, penetrating cavity, acute apical periodontitis, etc.).

The cause of this chronic disease is the deterioration of periodontal and marginal that originates in 2.7, which, owing to the periodontal alteration next to the possible defect in the endodontic treatment, could produce an inflammatory process in the apical periodontal space. This process, sustained over time, leads to a lack of integrity in the left maxillary sinus floor, with loss of cortical bone hyperplasia of the mucosa caused by the alteration of Schneidarian membrane (Rud & Rud, 1998).

The diagnosis of the dental origin of the disease is mainly based on dental examination and clinical findings and medical examination, including an assessment of the patient's symptoms and medical history, which are correlated with the exploration of the patient. The review includes the inspection of the oral tissues and the lobby, looking for inflammation and erythema, despite the fact that this finding is rarely seen in association with the maxillary sinus. Inflammation of the soft tissue is rarely caused by maxillary sinusitis due to the absence of veins anastomosed and connecting to the subcutaneous tissue, but chronic sinusitis is likely to erode some of the sinus wall, causing a visible swelling of the soft tissue, particularly at the intraoral (Rafetto, 1999). Commonly, an apical root injury may be the nest of a bacterial sinusitis. Palpation of the maxillary anterior region can produce a dull pain, and percussion pieces can reveal an antral jaw pain localized to one or more teeth. The assessment of the pulp vitality of the teeth or the use of thermal tests can help in diagnosis. Periodontal assessment is also presented as an important aspect to study the etiology of this disease as is indicated in our report. Besides otolaryngologic evaluation using rinoscopy, nasal sinus endoscopy, aspiration of the sinus content for cytological and microbiological evaluations can help in making a correct diagnosis (Brook, 2006).

The use of imaging techniques is a key tool in establishing the diagnosis. Orthopantomography is useful to assess the relationship of the maxillary teeth with the maxillary sinus, the presence of air or psudocyst, identifying movements of tooth roots, or the presence of teeth or foreign bodies inside the sinus, such as a dental implant. However, the TAC is the gold standard for an adequate image of the maxillary sinus due to the ability to view the bone and soft tissue and obtain thin sections and multiple points of view, which creates a real vision diagnosis of this condition (Brook, 2006).

The treatment of sinusitis should be focused on solving the dental disease (reprocessing or extraction), periodontal disease, and sinus hyperplasia (mucosa hyperplasia).

If the disturbance is resolved through dental endodontic retreatment, the main goal would be to provide an airtight seal apical (Rud & Rud). This procedure is most often answered satisfactorily (Selden), but in this case the compromise periodontal diminishes the expectations of success.

The alternative choice would be the extraction of the tooth 2.7, assessing a subsequent rehabilitation through osseointegrated implants. For this, the treatment of sinus alteration is through the path of surgery, which is complemented with an antibiotic therapy. The use of the technique of modified Caldwell-Luc is the classic method, in which the heart is approached through a window into the canine fossa (Barzilai *et al.,* 2005) and through curettage where the affected tissue is removed. This method is traumatic and postoperative presents an increased risk (Costa *et al.*). But in this case is that of choice, a technique more innocuous as endoscopy (Barzilai *et al*. and Brock, 2005) would not be able to eliminate a large amount of inflammatory tissue. For a subsequent rehabilitation of osseointegrated implants, we need a sinus lift surgery or increased bone volume, as the quantity (at least 6mm thick and 10mm in height) and quality of the bone present is not optimal. This increase in the amount of bone tissue can be accomplished through the use of allografts, xenografts, autografts, or a combination of these materials (Bravetti *et al.,* 1998).

The antibiotic is rarely used because antibiotics do not cure an infection in the apical long term and, therefore, should be used only when there is a need for them (Rud & Rud).

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RESUMEN: Las lesiones inflamatorias que afectan los senos paranasales reciben la denominación genérica de sinusitis, siendo el seno maxilar el más comúnmente afectado. Esta inflamación puede tener diversos orígenes, entre ellos el dentario. Se describe un caso de sinusitis del seno maxilar de origen dentario de un paciente de 56 años que consultó por dolor en la zona maxilar del lado izquierdo referido a una pieza dentaria y se realiza una revisión parcial de la literatura.

PALABRAS CLAVE: sinusitis, seno maxilar, origen dentario, i-CAT.

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