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CASE REPORT

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Pansinusitis from Dental Origin: Pre and Post-Treatment Multi-Slice Computed Tomography Imaging

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Abstract

Oroantral communication is a teeth post-extraction complication defined as a communication created between the maxillary sinus floor and the oral cavity. If it is not treated, oroantral communication may progress to an oroantral fistula and/or sinusitis. Maxillary sinus communication with paranasal sinuses may allow the spread of sinusal disease, leading to the development of pansinusitis. Pansinusitis can progress to life-threatening intracranial complications, such as meningismus, focal neurological disorders, loss of consciousness and seizures. In this case report, it is described a case of post-extraction OAC which progressed to an oroantral fistula and pansinusitis, detected by multislice computed tomography. After the proper treatment, which included the use of antibiotics and communication surgical closure, multislice computed tomography revealed lack of opacification of paranasal sinus with an acceptable outcome.

Keywords: *Maxillary sinusitis, maxillary sinus, paranasal sinuses, sinusitis, sinus infections*

Introduction

Maxillary sinus is intimately linked to the alveolar bone; eventually upper molar or premolar apices can even perforate its floor [1]. The close relationship between maxillary sinus floor and tooth roots can lead to accidental oroantral communication [2]. Thus, it is indispensable for dental surgeons to be aware of the exact relationship between maxillary teeth and sinus floor before any surgery procedure in this region.

Oroantral communication (OAC) is defined as a communication created between the maxillary sinus floor and the oral cavity [3]. It is frequently a post-extraction complication resulting from extraction of upper posterior maxillary teeth, although it can also occur due to sinus augmentation or implant placement surgery, cyst and tumor enucleations, orthognathic surgeries, osteomyelitis and local trauma [4]. If OAC is not treated, it may progress to an oroantral fistula (OF) or chronic sinusitis [1].

Maxillary sinuses communication with other paranasal sinuses may allow the spread of maxillary sinus disease, leading to the development of pansinusitis. Pansinusitis can progress to life-threatening intracranial complications, such as meningismus, focal neurological disorders, loss of consciousness and seizures [5]. Therefore, disseminated sinusitis should be immediately treated, as well as its causal factor, the OAC, to avoid sinus infectious recontamination.

Thus, in the present report, it is described a case of a pansinusitis from odontogenic origin, associated with an OAC, which was resolved before OAC surgical intervention.

Case Report

A 30-year-old Caucasian woman attended to a consultation in Oral and Maxillofacial service at Hospital Municipal de Campo Limpo (São Paulo, Brazil) and reported the following symptomatology, after 6 months after undergoing to tooth extraction procedure of second upper molar, left side: continuous diffuse headache, bilateral nasal obstruction and intraoral discharged purulent wound. Her medical history was unremarkable.

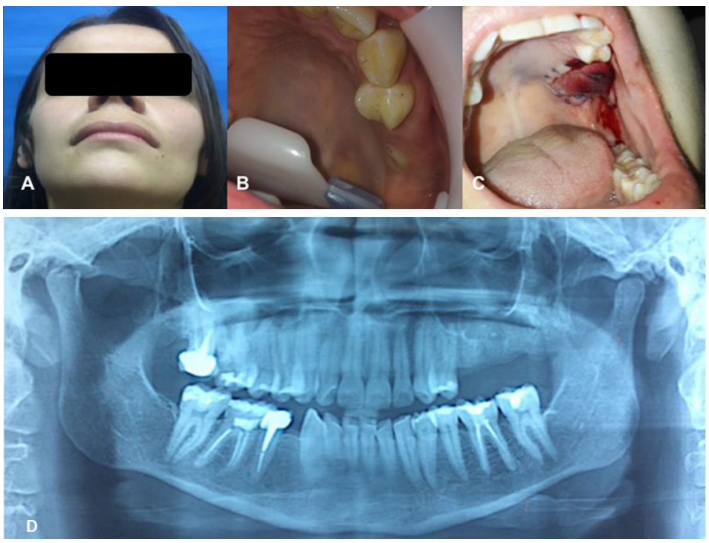

Figure 1. *1A: Extra oral picture. Note a discrete bulging, left side. 1B: Purulent secretion in alveolar crest, first/second upper molar area. 1C: Immediate post-surgery aspect. 1D:Panoramic radiograph of the case; discontinuation of maxillary sinus floor is noticed in upper molar/premolar region, left side.*

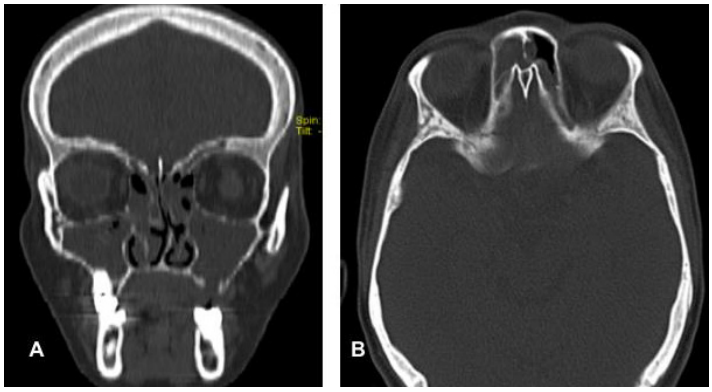

Figure 2. *The pre-treatment MCT examination coronal slices (Figure 2A) exhibited all paranasal sinus evident opacification. In Figure 2B, opacification of frontal sinus is evinced.*

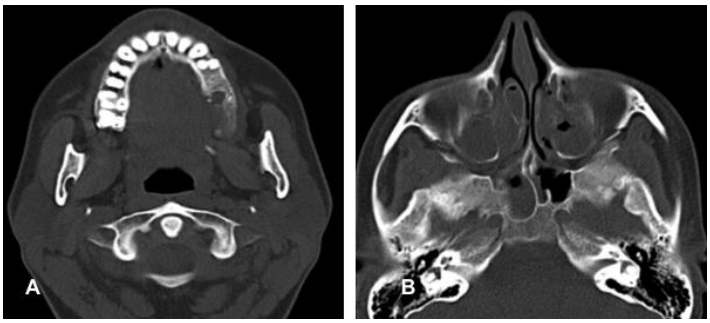

Figure 3. *Pre-treatment axial slices demonstrate the area of the OAC (Figure 3A) and the bilateral presence of air-fluid levels in maxillary sinus (Figure 3B).*

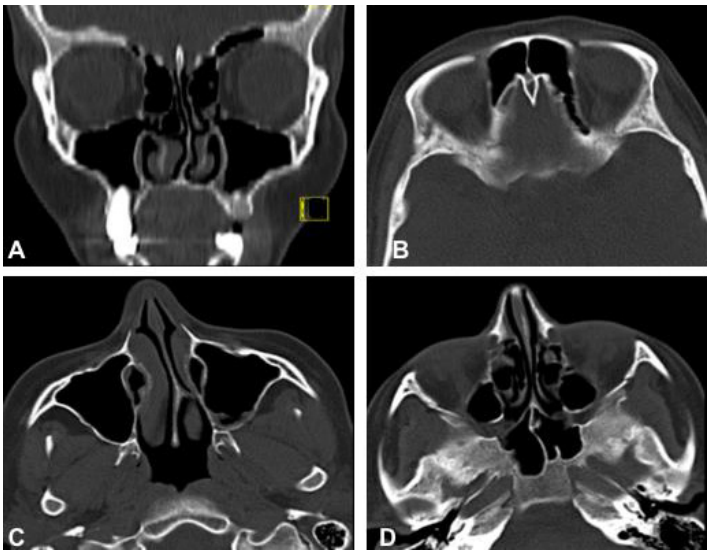

Figure 4. *Post-treatment MCT reveals opacification absence in all paranasal sinuses.*

Extraoral examination showed the presence of soft consistence discrete bulging in the left face with pain at palpation, as demonstrated in Figure 1A. Intraorally, it was observed presence of purulent secretion in the alveolar crest, associated with an OF, as show in Figure 1B. As patient has already undergone panoramic radiograph examination, she was then referred to multislice computed tomography (MCT) (Figure 1C).

Imaging evaluations

Panoramic examination demonstrated discontinuation of the maxillary sinus floor, in the second/first upper molar region, as exhibited in Figure 1D. Sinus involvement wasn't observed in the examination. The first MCT examination was performed 3 months after the initial consultation.

Non-contrast-enhanced, high resolution MCT with 16 slices (Philips Diamond Select Brilliance, Philips, Hamburg, Germany) was used for MCT imaging. Acquisition imaging parameters were: 1,0mm slice thickness; 1.0 mm spacing between slices; 250 mm field of view; 120kV peak and 250mA.

The pre-treatment MCT examination coronal slices (Figure 2A) exhibited all paranasal sinus evident opacification and in axial slice, opacification of frontal sinus in evinced (Figure 2B). In Figure 3, axial slices demonstrate the area of the OAC (Figure 3A) and the bilateral presence of air-fluid levels in maxillary sinus (Figure 3B). At this point, a diagnostic hypothesis of pansinusitis from odontogenic origin, associated with OAC was postulated.

Then, patient was referred to surgical treatment to close de OAC and remove the OF. In order to certify disease acceptable outcome, a new MCT examination was requested one month after the surgical procedure. Post-treatment MCT revealed absence of sinusal opacification, as demonstrated in Figure 4 and the patient was released from treatment.

Surgical procedures

Patient was operated under general anesthesia (nasotracheal intubation) by the Caldwell-Luc type maxillary sinusectomy technique associated with palatal flap. Following the injection of 2% lidocaine with 1:1,00,000 epinephrine into the vestibulomaxillary area and greater palatine foramen, an access to the maxillary sinus was started at the mucogingival border line via an incision of the mucosa down to the bone. Caldwell-Luc type maxillary sinusectomy technique includes a bony window was made on the anterolateral wall of the maxillary sinus, stripping down the bone margins and the mucosa of the fistula to healthy tissue, curettage of the left maxillary sinus, irrigation with saline solution and rotation vestibular maxillary mucosal flap. After this technique, close OAC by using palatal mucosa flap (Figure 1 C). The surgeons used absorbable thread 4-0 Polyglactin 910 (Vicryl®) in all the steps. Postoperative care included antibiotics for 14 days, instructions to avoid tooth brushing in local area and to avoid blowing for seven days. Patient was seen postoperatively on the 7th, 14th, 30th, 60th and 90th day. Postoperative evolution was with pain, small swelling, nasal bleeding and no infection. On this case report, the duration of pain and swelling were 4 days, the first day presenting with nasal bleeding and no infection occurred all time by follow-up.

Discussion

Odontogenic sinusitis incidence ranges about 10 to 12% of all cases of maxillary sinusitis [6]. OAC communication frequency may vary from 0.008 to 1% [7]. OAC occurs when the Schneiderian membrane or mucoperiosteum is interrupted [8,9] and differs in microbiology and physiopathology from primary sinusitis [6]. When the maxillary sinus floor barrier is interrupted, it is not difficult for the oral flora to pass towards the sinuses, mainly anaerobic microorganisms [10].

Besides the symptoms reported by the patient of the present case report, poor drainage and increase in intranasal pressure, associated with the inflammation and obstruction of the ostium may be present [10]. Sanguineous discharge and patient complaint of fluids entering the nasal cavity while eating or drinking also may be noticed.4 Decrease in blood flow and ciliary movements, leads to a reduction in oxygen pressure and pH, which facilitate the growth of the anaerobe microorganisms [8,9]. However, clinical presentation of odontogenic sinusitis is not specific and does not differ from primary sinusitis [10]; thus, a detailed intraoral examination concomitant to the collection of previous odontopatological patient history is primordial do establish the diagnosis of AOC and odontogenic sinusitis.

Pansinusitis may be associated with multiple complications due to local intracranial or intraorbital spread, such as orbital inflammatory edema, subperiosteal abscess and cavernous sinus thrombosis [11], as well as brain abscess [12]. This life-threatening condition demands early diagnosis.

Imaging examinations are essential to determinate the extent of sinusal disease spread, as well as treatment response. MCT, as applied in this report, is preferable [13] and can be also useful to measure the size of bone opening. MCT is often applied without contrast, unless extra sinus involvement is a hypothesis [13]. Notwithstanding, magnetic resonance imaging can also be performed, and the variability of signal intensity of sinonasal secretion resulting from protein concentration help differing sinus diseases from different nature [13].

If sinusitis is diagnosed, preoperative antibiotics treatment is recommended [4]. In the present report, antibiotic treatment prior to surgery was performed. If infected polyps or retention cysts are observed in the maxillary sinus, it is simultaneous removal prior or during OAC closing may be indicated [4]. Infected antral mucosa should also always be removed, as sinusectomy by the Caldwell-Luc approach associated with a palatal rotation-advancement flap for repair of oroantral fistula. Complete obliteration of the surgical wound can avoid late complications and additional surgical procedures [7].

Thus, in conclusion, immediate treatment of OAC can avoid sinonasal disease. Early diagnosis is mandatory in the presence of maxillary sinusitis to avoid disease spread. Imaging examinations, particularly MCT, are essential as complementary tools in the diagnostics and the evaluation of disease extent, both previously to the treatment and after the treatment, when the evaluation of the outcome is indispensable.

Conflicts of Interest

Authors declares no conflicts of interest.

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References

1. Goller-Bulut D, Sekerci AE, Köse E, Sisman Y. Cone beam computed tomographic analysis of maxillary premolars and molars to detect the relationship between periapical and marginal bone loss and mucosal thickness of maxillary sinus. *Med Oral Patol Oral Cir Bucal* 2015; 20: e572-9.
2. Hauman CH, Chandler NP, Tong DC. Endodontic implications of the maxillary sinus: a review. *Int Endod J* 2002; 35: 127-41.
3. Abuabara A, Cortez AL, Passeri LA, de Moraes M, Moreira RW. Evaluation of different treatments for oroantral/oronasal communications: experience of 112 cases. *Int J Oral Maxillofac Surg* 2006; 35: 155-158.
4. Dym H, Wolf JC. Oroantral communication. *Oral Maxillofac Surg Clin North Am* 2012; 24: 239-247, viii-ix.
5. McIntosh DL, Mahadevan M. Frontal sinus mini-trephination for acute sinusitis complicated by intracranial infection, *Int J Pediatr Otorhinolaryngol* 2007; 71: 1573-7.
6. Felisati G, Chiapasco M, Lozza P, Saibene AM, Pipolo C, Zaniboni M, et al. Sinonasal complications resulting from dental treatment: outcome-oriented proposal of classification and surgical protocol. *Am J Rhinol Allergy* 2013; 27: e101-6.
7. Azenha MR, Kato RB, Bueno RB, Neto PJ, Ribeiro MC. Accidents and complications associated to third molar surgeries performed by dentistry students. *Oral Maxillofac Surg* 2014; 18: 459-64.
8. Mehra P, Jeong D. Maxillary sinusitis of odontogenic origin. *Curr Allergy Asthma Rep* 2009; 9: 238-243.
9. Brook I (2006) Sinusitis of odontogenic origin. *Otolaryngol Head Neck Surg* 135: 349-355.
10. Bravo Cordero G, Minzer Ferrer S, Fernández L. Odontogenic sinusitis, oro-antral fistula and surgical repair by Bichat's fat pad: Literature review. *Acta Otorrinolaringol Esp* 2016; 67: 107-13.
11. Bashkaran K, Shatriah I, Zunaina E, Bakiah S, Sakinah Z. Pansinusitis causing bilateral optic neuritis in a 9-year-old child. *Orbit* 2009; 28: 377-79.
12. Rosca T, Mincu G, Sarafoleanu C, Sarafoleanu D, Ciprut T. An extensive left subperiosteal frontotemporal orbital abscess and left suppurative pansinusitis with an odontogenic origin. *Oftalmologia* 1999; 48: 67-71.
13. Basha M, Blitz AM. Imaging of the paranasal sinuses. *Semin Roentgenol* 2013; 48: 14-34.

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