

Maxillary odontogenic sinusitis, complicated with cerebral abscess – case report

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Rezumat

Sinuzită maxilară odontogenă, complicată cu abces cerebral - prezentare de caz

Sinuzita maxilară netratată sau incorect tratată, poate duce la apariția unor complicații loco-regionale, primele structuri afectate fiind celelalte sinusuri paranasale. De aceea, înțelegerea patologiei inflamatorii a sinusului maxilar și în special a complicațiilor care pot surveni, este deosebit de importantă. Scopul acestei lucrări, este acela de a evidenția posibilitatea apariției unor complicații ale inflamației sinusurilor paranasale, care, în anumite condiții, pot amenința viața pacientului datorită proximității față de structuri vitale. Cazul de față este cel al unui pacient de sex masculin în vârstă de 16 ani, care a dezvoltat un abces cerebral ca și complicație a unei sinuzite maxilare și frontale stângi. Diagnosticarea precoce, abordarea multidisciplinară și indicația corectă a tratamentului chirurgical, precum și detectarea precoce a complicațiilor, în special în cazul pacienților tineri de sex masculin, sunt deosebit de importante.

Cuvinte cheie: sinus maxilar, abces cerebral, sinuzită

Abstract

Maxillary sinus inflammation, when untreated or incorrectly treated, may extend locoregionally, the remaining paranasal sinuses being the first affected anatomical structures. This is why the understanding of the inflammatory pathology of the maxillary sinus, and particularly of the complications it can generate, is extremely important. The purpose of this presentation is to point out that inflammations of the paranasal sinuses are susceptible to develop complications in certain conditions and threaten the patient's life due to the proximity of vital structures. This is the case of a 16 years old male patient who developed a left maxillary and frontal sinusitis, complicated with cerebral abscess. Early detection, multidisciplinary approach and proper indication of surgical treatment, as well as early suspicion of complication, especially in young male adolescents, are extremely important.

Key words: maxillary sinus, cerebral abscess, sinusitis

Introduction

Paranasal sinuses are pneumatic cavities situated on either side of the nasal fossae, as structures of the maxillary bone and communicate with the nasal cavity through orifices in the middle nasal meatus. Sinuses are layered with cylindrical pseudo stratified epithelium, much similar to the nasal mucosa, only thinner (1).

The inflammation of the maxillary sinus mucosa is generally known as maxillary sinusitis, either in an acute or chronic form. Sources for maxillary sinus infection are either the nasal or the oral cavity, because of the close proximity to

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the sinus. From this point of view, we can distinguish two forms of sinusitis: rhinogenic (as an extension of an inflammation of the nasal fossae) and odontogenic (due to propagation of an oral, mostly tooth-borne infection to the maxillary sinus mucosa (2,3).

If poorly treated, maxillary sinusitis can extend locally or regionally, among the first affected structures being the other paranasal sinuses. In rare cases, the inflammation can metastasize to vital organs such as the brain (4).

Material and Method

For the present study a case with chronic maxillary odontogenic sinusitis was selected, extended to the infratemporal fossa and complicated with a cerebral abscess. The case was documented by medical letters from the hospitals where the patient was previously treated, before entering our clinic, by imaging and laboratory tests results. During our treatment each stage was documented by MRI image.

A 16 years old male patient was admitted in our Clinic in April 2008.

He had a history of pain in the left cheek region for about two weeks, which then extended to the left frontal region. A mild congestion of the left cheek region was also present. No other medical history relevant for the present condition was noted (4). At the indication of the family physician, the patient presented himself to the ENT surgeon. He was diagnosed with left pansinusitis and surgically treated by endoscopic techniques, being simultaneously treated with wide spectrum antibiotics. Surgery in the ENT department consisted of an endoscopical partial maxillary sinus cure, without addressing the dental cause (2). After surgery the evolution was unsatisfactory, so he was referred to a dentist who extracted the first upper left molar, considered to be the cause for the maxillary sinusitis thus causing an oral-antral fistula (Fig. 1) (3,5).

The general status of the patient was progressively altered, with the onset of hemifacial pain, increasing in intensity at the change of the head position, nausea, vertigo and fever of 38-



Figure 1. Panoramic aspect of the left maxilla, oroantral fistula after extraction of 26

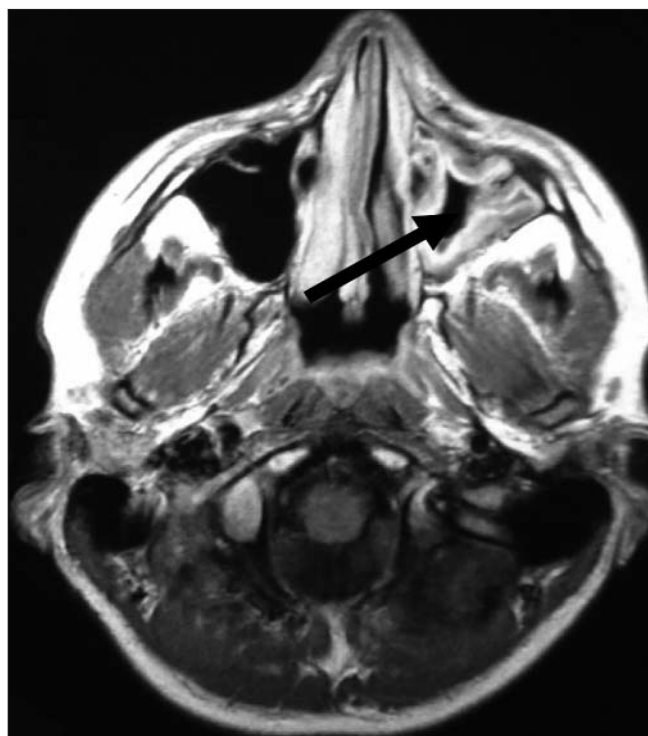


Figure 2. Inflammation of the left maxillary sinus mucosa

39.5°C, alternating with short intervals of 37.1-37.3°C. As a result of the rapid alteration of the general status, the specialists in our clinic were consulted. Due to the clinical symptoms and the altered general status a central nervous system lesion was suspected and the patient was transferred and admitted as an emergency in the Neurosurgery Clinic.

Clinical features and MRI image revealed a left maxillary sinusitis (Fig. 2), a left frontal sinusitis and a cerebral abscess (Fig. 3).

Emergency surgery was performed to ensure drainage of the frontal sinus and the cerebral abscess, through a frontal and parietal approach (Fig. 4, 5).

At the same time intravenous antibiotic treatment was undertaken by administering Metronidazole 1.5g/day, Vancomycine 2g/day, Ceftriaxone 4g/day, as well as corticoids in the form Dexamethason 12mg/day (also intravenously) and oral anticonvulsivants as Acidum Valproicum (Depakine) 1g/day.

Results

Postoperatively, the general condition is gradually improving, the inflammatory symptoms slowly recede, as local and general recovery of the patient take place.

After twenty days of hospitalization, the patient is transferred to the Clinic of Oral and Maxillofacial surgery in Cluj-Napoca for surgical treatment of the chronic maxillary sinusitis and closure of the oro-sinusal fistula.

A Caldwell-Luc radical sinus cure was performed, through an anterior sinus wall approach (Fig. 6) and the

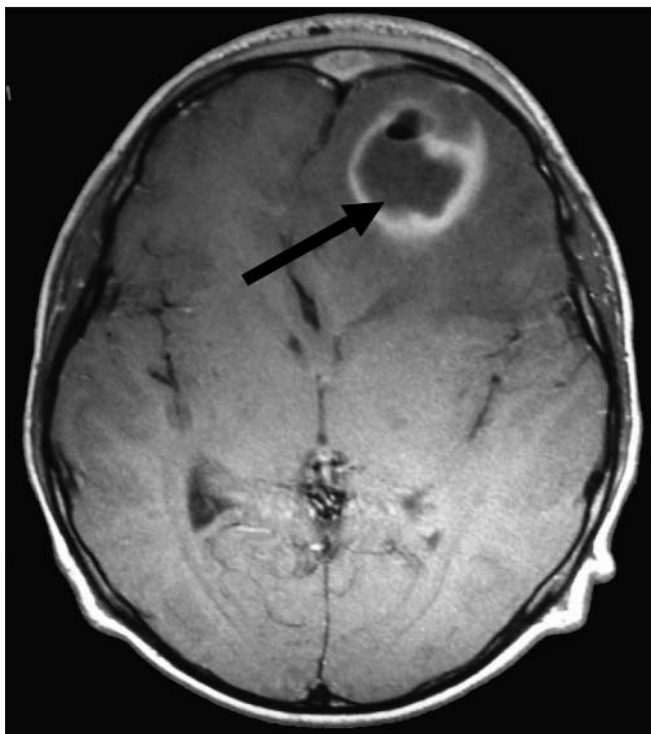


Figure 3. Pus collection in the left frontal lobe of the brain

oro-sinusal fistula was closed with a vestibular flap (Fig. 7).

Drainage of the sinus cavity was secured by iodophormed gauze to the ipsilateral nasal fossa and was suppressed progressively during the first three postoperative days.

Postoperative evolution of the patient was uneventful, patient was dismissed 7 days after surgery and stitches were removed in the Outpatient Clinic 10 days after surgery.



Figures 4-5. Clinical view 5 months after surgery. Scars of the frontal approach for endocranial drainage of the cerebral abscess



Figure 6. Intraoperative aspect of the radical sinus cure. Anterior-lateral approach of the maxillary sinus. Oro-antral fistula through the alveola of the first left maxillary molar



Figure 7. Clinical postoperative aspect 3 days after surgery. Closure of the oro-antral fistula with vestibular and cheek flap

Discussion

Cerebral complications in this case were generated under the following circumstances: an aggressive microbial selection during various underdosed antibacterial treatments, from which only the staphylococcus aureus could be evidenced, a weakened organism of the patient due to subnutrition during the early stages of the disease, incomplete surgical approach (without addressing the odontogenic cause) and peculiar anatomical conditions represented by the diploic venous system in young male adolescents. (1)

Elaine Rosenfeld and Rowley (1993) discovered in their 12 years study 9 cases of infectious intracranial complications in children between 2 and 16 years of age, with a maximum incidence around the age of 14. The majority of their cases were male patients (7 out of 9). Episodes of acute maxillary sinusitis were found only in the history of 2 of the above cases. Most common symptoms in patients in the above study were: fever (67%), headaches (67%) and rhinoreea in only 22% of the cases (5).

The presented case is in accordance with the study mentioned above as well as from the age and gender, as from the symptoms point of view.

Cerebral abscess is more common in adolescent boys due to a peak in vascularization of the diploic venous system of this age group (2).

The case in the present study had a rapid spreading of the infection from the maxillary sinus rapidly extending to the frontal sinus, thus the cerebral abscess was caused rather by blood dissemination than by erosion of the posterior wall of the frontal sinus (6). To support our statement we suggest the MRI aspect in image number 3, where the distance between the posterior wall of the frontal sinus and the abscess is of approximately 1 cm without any signs of lesions (no contiguity), and the posterior wall and the frontal sinus shows no defect (no continuity). (6)

The study by Jonesa et al. (2002) on the search for prevention of intracranial complications states that more than half (55%) of the 47 patients identified had consulted their general physician before the neurological complication and were receiving antibiotics.

The mean time between the rhinosinusitis and neurological signs was 15 days (3-39 days). The time between the consultation with the general physician and the diagnosis of a complication was 5.5 days (0-17days). Only 7 patients (15%) had a previous history of rhinosinusitis; for the 40 others, this was an inaugural common acute rhinosinusitis.

The sinuses most often responsible were: the frontal sinus (42 patients) and the ethmoid sinus (21 patients) (7).

The general physician also consulted the present case before the onset of neurological complications and the time-frame between sinusitis and neurological complications was of 14 days, without any previous history of sinusitis.

Akimura (1998) presents the case of a 38 years old patient with a cerebral abscess due to an asymptomatic maxillary sinusitis, with fatal intraventricular rupture (8).

Conclusion

Early detection, aggressive medical and early surgical treatment with a multidisciplinary approach involving, neurosurgical and maxillofacial procedures can successfully treat the complications with a significant reduction in the morbidity and almost no mortality.

It is always advisable to prevent a severe condition by correct and early treatment of maxillary sinusitis with particular attention to details.

Always suspect cerebral complications in adolescents at first neurological symptoms and act accordingly.

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