



MAXILLARY AND ETHMOIDAL RHINOSINUSITIS COMPLICATED BY ORBITAL CELLULITIS AND EXTRA-DURAL EMPYEMA: A CASE REPORT

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ABSTRACT

We report the case of a 14-year-old girl admitted with severe frontal headache preceded by bilateral nasal obstruction and purulent rhinorrhea. The CT scan of the face and brain showed a fluid filling of the right maxillary and right ethmoidal sinuses, a right orbital cellulitis and a concave extra-dural bifrontal hypodensity. She underwent an inferior meatotomy and empyema evacuation.

KEY WORDS: extra-dural empyema, orbital cellulitis, rhinosinusitis.

INTRODUCTION

A complication of sinusitis is defined as an event secondary to the extension of an infection originating in the paranasal sinuses.^[1] Orbital complications of rhinosinusitis are common, whereas endocranial complications are rare, including orbital cellulitis and extradural empyema.^[2; 3; 4] The latter is severe, compromising the short-term vital prognosis.

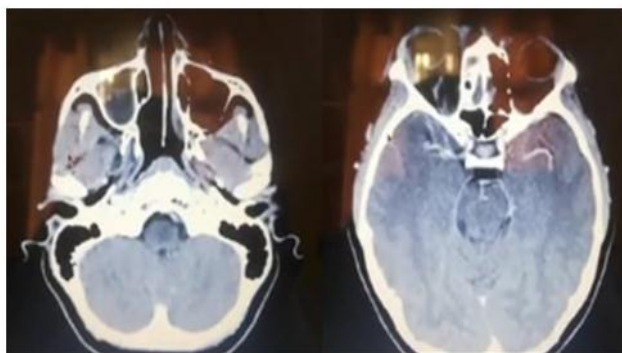
OBSERVATION

A 14-year-old girl was admitted to the ENT department of the Jean Dieu Donné Rakotovo Befelatanana University Hospital in Antananarivo in August 2020 with a ten-day history of frontal headache and photophobia preceded by bilateral nasal obstruction, purulent rhinorrhea and posterior discharge. On examination, she was afebrile; presented with a tender right maxillary sinus point and pus of the right middle meatus; right upper eyelid edema; limitation of right ocular mobility, without decrease in visual acuity (Appendix 1); without focal neurological signs. A biological inflammatory syndrome was noted (Neutrophilic Polynuclear Cell: 19635G/L [2.0-7.5G/L]; CRP: 213.5mg/L [<10mg/L]). The CT scan of the facial and cerebral mass revealed a fluid filling of the right maxillary and right ethmoidal sinuses (Appendix 2), a right orbital cellulitis and a bifrontal extradural empyema (Appendix 3). She underwent bilateral intracranial empyema evacuation using a flap on the right and a trepan hole on the left, an

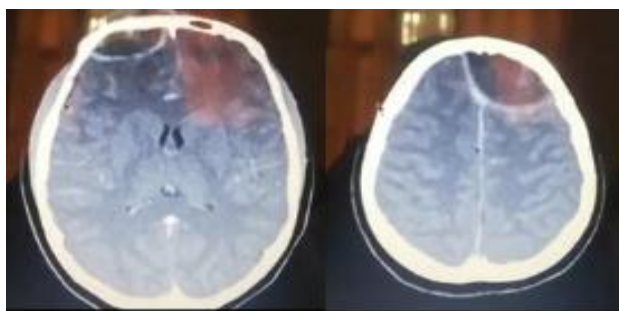
inferior meatotomy and an orbitotomy. Bacteriological examination of the pus did not identify a germ. The operative course was simple.



Appendix 1 : right upper eyelid edema.



Appendix 2 : fluid filling of the right maxillary and ethmoidal sinus.



Appendix 3: bifrontal extradural empyema.

DISCUSSION

Locoregional complications of rhinosinusitis are orbital and endocranial.^[4] The seriousness of orbital cellulitis lies in the risk of blindness due to optic nerve damage.^[3] Clinically, our case is consistent with the literature with edema of the right upper eyelid, limitation of ocular mobility without decrease of visual acuity. Chemosis and ptosis complete the physical signs.^[5] The CT scan of the facial mass is the reference imaging to make the diagnosis.^[6] The germs involved are *Streptococcus pneumoniae*, Group A *Streptococcus*, *Staphylococcus aureus*, *Haemophilus influenzae* serotype B and anaerobes.^[7] Treatment is primarily medical with antibiotic therapy targeting these germs: high dose amoxicillin/clavulanic acid (up to 150mg/kg in 3 doses); in case of allergy to penicillin, cephalosporins are associated with an imidazole, either ceftriaxone 80 to 100mg/kg/day or cefotaxime 150 to 200mg/kg/day and metronidazole 20 to 30mg/kg/day. Surgical drainage of the cellulitis completes the medical treatment.^[7; 8]

Extradural empyema is the rarest intracranial complication of rhinosinusitis, accounting for 6% of such complications in the Netherlands in 2011.^[9; 10] It is serious, compromising the patient's short-term vital prognosis.^[4] Intracranial transition occurs through dissemination of the infection from the papyraceous lamina or direct contact after a post-traumatic skull base fracture.^[11] In the case of extra-dural empyema, the infection usually follows contamination by contiguity. Headache and vomiting are the main functional signs in children.^[12; 13] The bacteriology of pus did not find any germ because of previous antibiotic therapy. The main germs involved were *Streptococcus pneumoniae*,

Haemophilus influenzae and *Staphylococcus*.^[11] CT scans of the face and brain without and with injection of contrast medium are the reference imaging technique for the diagnosis of intracranial empyema of sinus origin.^[11] The treatment consists of probabilistic antibiotic therapy with good meningeal penetration and then adapted secondarily to the antibiogram. The concomitant association of meatotomy for drainage and craniotomy for empyema evacuation has been shown to be effective.^[14] According to Patel NA et al, the incidence of morbidity and mortality is respectively 27% and 3.3%.^[13]

CONCLUSION

Orbital and intracranial localization of rhinosinusitis complication in children is a rather rare entity. Extradural empyema is serious and may be life threatening in the short term. A CT scan of the facial and cerebral mass allows the diagnosis to be made. *Streptococcus pneumoniae* and *Haemophilus influenzae* remain the causative organisms. Treatment of the etiology of the infection is essential and probabilistic and then secondarily adapted antibiotic therapy is the first-line treatment completed by craniotomy.

Conflicts of interest

The authors declare that they have no relationship with this article.

Contribution of the authors

All authors contributed to the realization of this article.

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