

Orbital Subperiosteal Abscess Complicating Acute Ethmoiditis: A Case Report and Review of the Literature

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Abstract

Case Report

Acute ethmoiditis in children is an infection of the ethmoid sinuses. The germs most often involved are *Haemophilus influenzae*, *Streptococcus pneumoniae*, *Staphylococcus aureus*. The diagnosis is made when edema appears in the internal angle of the eye, often in the context of common nasopharyngitis. The Chandler classification codes the involvement of the orbit which can jeopardize the visual prognosis at advanced stages. The CT scan of the face confirms the diagnosis and helps detect ocular and endocranial complications. Treatment is essentially medical based on a combination of antibiotics. Surgery consists of drainage of the orbital abscess by external, endoscopic or combined approach.

Keywords: Acute ethmoiditis, ethmoid sinuses, *Staphylococcus aureus*, nasopharyngitis.

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INTRODUCTION

Acute ethmoiditis is the bacterial infection of the cells of the ethmoid labyrinth [1]. It is a serious condition which poses a risk of spreading the germ to the orbit and intracranial spaces [2]. His prognosis has been significantly improved by advances in antibiotic therapy. We report the case of a 12-year-old boy, with no previous history, suffering from acute ethmoiditis complicated by a left orbital subperiosteal abscess.

CASE REPORT

This is a 12-year-old child, with no particular pathological history, who presented to the emergency room for intermittent headaches lasting 10 days, with secondary appearance of swelling of the left hemiface predominantly at the peri-orbital level. left evolving in a context of unquantified fever (Figure 1). On admission, the child was febrile at 39°C, had red, warm and tender left eyelid edema, exophthalmos, left ophthalmoplegia, and pain on pressure at the sinus level.

A Blondeau CT scan was done which revealed left pansinusitis predominating at the ethmoidal level with individualization of an abscess under the left orbital periosteum (Figure 2). The biological assessment showed a CRP of 169 mg/l and WBC of 13,000/mm³.

The child underwent external puncture and drainage of the abscess under the left orbital periosteum (Figure 4) and endoscopic drainage of the sinuses (Figure 3), intravenous tri-antibiotic therapy combining ceftriaxone, Metronidazole and protected Amoxicillin and symptomatic treatment with analgesics, nasal wash with isotonic saline solution.

The samples found multisensitive *Streptococcus*. Monitoring was clinical and biological and the evolution was marked by an improvement in the patient's clinical condition with a CRP going from 169 mg/l to 9 mg/l in 10 days with total disappearance of symptoms (Figure 5).



Figure 1: Shows the left orbital subperiosteal abscess



Figure 2: Shows frontal section of a CT of the face showing left pansinusitis predominating at the ethmoidal level with the presence of a collection image at the level of the medial extra conical fat of the left orbit



Figure 3: Shows endoscopic sinus drainage in the operating room under general anesthesia

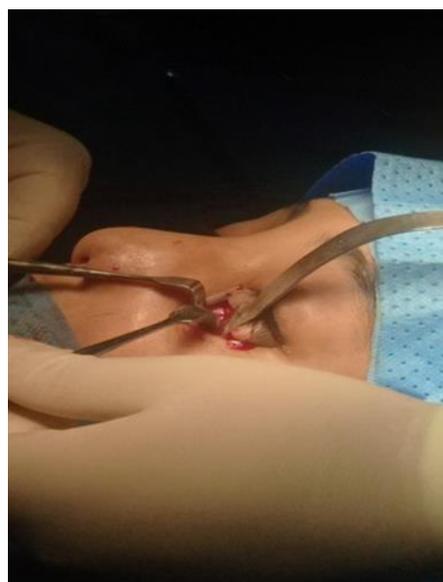


Figure 4: Shows the puncture and external drainage of the abscess under the orbital periosteum in the operating room under general anesthesia



Figure 5: Shows the post-operative control on day 10 under antibiotic therapy

DISCUSSION

Ethmoiditis is the most common sinusitis in children under 3 years old. At the complication stage, the average age is 6.1 years for peri-orbital edema with sinusitis, between 7 and 10.5 years for the collected stages [3, 4]. The symptomatology consists of eyelid edema following nasopharyngitis. This edema is red, hot, painful, predominantly in the upper eyelid and the inner corner of the eye. It is associated with a generally high fever (39°C) with deterioration of general condition, nasal obstruction and inconstant purulent nose [5].

On admission, it is usual to request a CRP measurement and a CBC. But the CRP level and polynucleosis vary greatly from one child to another and cannot in any way predict the existence or not of an abscess [6]. These examinations are especially useful for therapeutic monitoring.

Computed tomography (CT): this is the key examination because it confirms ethmoiditis, visualizes the other sinuses present and detects orbital [2, 7] and endocranial [2, 8] complications. Orbital complications are classified into five stages according to Chandler [9]:

- Stage 1: Pre-orbital or pre-septal cellulitis.
- Stage 2: Orbital cellulitis.
- Stage 3: Subperiosteal orbital abscess.
- Stage 4: Orbital phlegmon.
- Stage 5: Cavernous sinus thrombosis.

The indication for CT is indisputable in the face of significant eyelid edema, exophthalmos, ocular mobility disorders or the presence of a fluctuating mass in the internal angle of the eye [2].

The search for the germ in question is carried out [2, 3, 7] on the pus in the case of puncture or drainage

of a subperiosteal abscess, on blood culture on cerebrospinal fluid in the case of associated meningitis.

Treatment is essentially medical and sometimes surgical. It is based on symptomatic treatment based on analgesics and nasal washing with isotonic saline water and parenteral antibiotic therapy.

The choice of antibiotic depends on its action on *Hamophilus influenzae* possibly secreting β -lactamase, on *Staphylococcus aureus* sensitive to methicillin (SAMAS) or resistant to methicillin (MRSA), on *Streptococcus pneumoniae* and on anaerobes [2, 3].

Antibiotic therapy is probabilistic [2]. As first-line treatment, the cefotaxime-fosfomycin combination is prescribed at a dose of 100 to 200 mg/kg/day [2].

If fosfomycin is not available, cefotaxime + vancomycin (40 to 60 mg/kg/d) + metronidazole (30 mg/kg/d) are prescribed [2].

The duration of treatment is variable, with a minimum of 5 days [2, 7] parenterally. If the local and general signs improve, oral replacement can be done with the amoxicillin-clavulanic acid combination.

In the event of an allergy, in children over 6 years old, the relay is provided by pristinamycin and in children under 6 years old, by cotrimoxazole [2, 7].

The duration of antibiotic treatment is 15 days in total for forms without complications [2].

Surgical treatment is complementary to medical treatment. It is aimed at large subperiosteal abscesses larger than 3 mm with impact on the internal rectus

muscle [2]. This involves drainage of the abscess which is done by:

- External route: under general anesthesia, the abscess is punctured before drainage for bacteriological study then a supracaruncular incision is made.
- Endoscopic approach: attractive because it does not leave a scar but more difficult due to inflammation due to infection and bleeding, which can make the identification of surgical landmarks difficult [2, 9, 10].
- Combined approach: combining the external approach and the endoscopic approach, seems to combine the advantages of the two techniques [9].

Some authors [10] recommend adenoidectomy to remove infected lymphoid tissue.

CONCLUSION

Acute ethmoiditis in children is a severe bacterial infection which poses a risk of spreading the germ to the orbit and intracranial spaces. The diagnosis is clinical. Hospitalization is the rule. Medical treatment is based on antibiotic therapy, surgical indication is currently proposed in the event of ophthalmological complications or unfavorable clinical evolution in the presence of a subperiosteal abscess. The extent of exophthalmos and the size of the abscess measured on the CT scan are predictive criteria for surgical treatment in children presenting with acute orbital cellulitis with the presence of a subperiosteal abscess without orbital complications.

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