

Exteriorized acute ethmoiditis in a rural child: A case report

Thierry Mpengani, Aliocha N Nkodila, Gabriel Lema, Mireille Ngale,
Lydie Kainda, Charles Mbala, Richard N Matanda, Jérôme G Sokolo

ABSTRACT

Introduction: Acute ethmoiditis (AE) in children mainly concerns the ethmoid sinus. It is often diagnosed after its externalization. It is a serious infection, whose ocular and endocranial complications can jeopardize the visual and vital functional prognosis. The treatment is essentially medical based on the combination of antibiotics.

Case Report: Description of a case of ethmoiditis in a 3-year-old child consulting for eyelid edema that progressed within five days. The general condition was altered by a fever of 38.5°C, with an unwell appearance and left eyelid edema with a tendency to reduction of the eyelid fissure was noted. The ear, nose, throat (ENT) examination showed left perinasal swelling affecting the nasal pyramid, the zygomatic arch, and the left periorbital region. The left nasal cavity was of reduced caliber with the presence of mucopurulent secretions through the ipsilateral nostril orifice. Acute externalized ethmoiditis was made as a clinical diagnosis. The clinical evolution was good under antibiotic therapy for 15 days

with parenteral ceftriaxone which will be relayed by amoxi-clavulanic ac orally on the seventh day; parenteral metronidazole with a PO relay on the fifth day; parenteral dexamethasone and paracetamol for five days; argyrol nasally for seven days.

Conclusion: Acute ethmoiditis remains an infantile pathology with multiple neighborhood and remote complications, including periorbital and endocranial cellulitis involving vital and visual prognosis.

Keywords: Acute ethmoiditis, Child, Externalized

How to cite this article

Mpengani T, Nkodila AN, Lema G, Ngale M, Kainda L, Mbala C, Matanda RN, Sokolo JG. Exteriorized acute ethmoiditis in a rural child: A case report. Int J Case Rep Images 2023;14(2):123–127.

Article ID: 101424Z01TM2023

doi: 10.5348/101424Z01TM2023CR

Thierry Mpengani¹, Aliocha N Nkodila², Gabriel Lema¹, Mireille Ngale³, Lydie Kainda⁴, Charles Mbala⁵, Richard N Matanda¹, Jérôme G Sokolo¹

Affiliations: ¹Department of ORL, University of Kinshasa, Kinshasa, Democratic Republic of the Congo; ²Department of Family Medicine and Primary Health Care, Protestant University in Congo, Kinshasa, Democratic Republic of the Congo; ³Pharmacovigilance Unit, University of Kinshasa, Kinshasa, Democratic Republic of the Congo; ⁴Department of ORL, University of Lubumbashi, Lubumbashi, Democratic Republic of the Congo; ⁵Department of Pediatrics, Kongo University, Kimpese, Democratic Republic of the Congo.

Corresponding Author: Aliocha Nkodila, Department of Family Medicine and Primary Health Care, Protestant University in Congo, Kinshasa, Democratic Republic of the Congo; Email: nkodilaaliocha@gmail.com

Received: 09 August 2023

Accepted: 12 October 2023

Published: 14 November 2023

INTRODUCTION

Acute ethmoiditis is a bacterial infection that develops in the cells of the ethmoid labyrinth, the main sinus of the face in children [1]. It is a serious infection, for which early diagnosis and urgent treatment make it possible to avoid ophthalmological and endocranial complications that could endanger the visual and vital prognosis [1]. It frequently occurs in young children. The germs most often incriminated are: *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Haemophilus influenzae*, and *Moraxella catarrhalis* [1]. Orbital extension is the most common complication of ethmoidal sinusitis. The incidence of orbital cellulitis has decreased significantly in recent years in developed countries thanks to better

access to vaccination, treatment of upper respiratory tract infections, and early and targeted management of the disease [2]. However, in developing countries and particularly in Africa, orbital cellulitis still represents a threat [3–7]. Its frequency is about 91% of complications of ethmoiditis in children [7]. Its externalization toward the orbit, the deterioration of the general state in a context of fever, directs toward the clinical diagnosis. Imaging is necessary to verify the absence of the complications that can enamel this disease [3]. The treatment is based on broad-spectrum antibiotic therapy, sometimes surgery is necessary. The present clinical case, in an observational approach, aims to identify the clinical, therapeutic, and evolutionary situation with a 3-year-old child in whom the diagnosis of acute externalized ethmoiditis had been made.

CASE REPORT

This is a 3-year-old child, brought in by his mother for left eyelid edema that had been going on for around five days, occurring in clinical context of fever and recurrent rhinorrhoea.

Physical examination:

The general condition was altered by a fever of 38.5°C, with an unwell appearance and left eyelid edema with a tendency to reduction of the eyelid fissure was noted (Figure 1).

The otorhinolaryngology (ORL) examination performed was dominated by left perinasal swelling involving the nasal pyramid, zygomatic arch, and left periorbital region. The left nasal cavity was of reduced caliber with the presence of mucopurulent secretions through the ipsilateral nostril orifice.

Examination of the lymph node areas carried out did not reveal locoregional lymphadenopathy.



Figure 1: Presentation of the child at admission.

Diagnosis

Acute externalized ethmoiditis was made as a clinical diagnosis. The differential diagnosis arises in the face of certain ocular pathologies: insect bites, banal conjunctivitis, acute dacryocystitis, cellulitis of dental origin, post-traumatic cellulitis, and malignant staphylococcal disease of the face.

Biology: The biological assessment was marked by a high C-reactive protein (CRP) at 195 mg/L, hyperleukocytosis (GB: 13,900/mm³) with neutrophil polynuclear predominance at 84%.

Imaging

The requested computed tomography (CT) scan was not carried out due to a lack of financial means (farmers' families, low income).

Treatment

The patient received parenteral ceftriaxone as treatment, which will be replaced by amoxi-clavulanic acid orally on the seventh day; parenteral metronidazole with a PO relay on the fifth day; parenteral dexamethasone and paracetamol for five days; argyrol nasally for seven days. The total duration of antibiotic therapy was 15 days.

Evolution

The clinical evolution was good under treatment, with absence of fever after 48 hours, gradual reduction of edema until its complete improvement on the seventh day (Figure 2A–E).

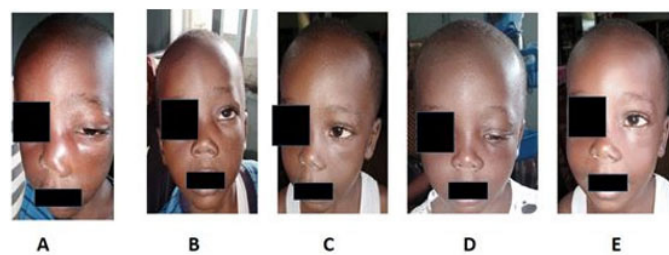


Figure 2: Evolution of the children after treatment (A: 48 hours after; B: 72 hours after; C: 96 hours after; D: fifth day; E: seventh day).

DISCUSSION

The ethmoid cells are the first sinus cavities to appear at birth. These cells drain into the nasal cavity at the level of the middle and superior meatus. The ethmoidal labyrinth is related to the anterior floor of the base of the skull above, and with the orbit outside, separated from it by a thin bony wall called the lamina papyracea. The mucosa of the nasal cavities is continuous with that of the ethmoid cells; therefore, any infection of the nasal cavities can spread to the

ethmoid [8]. Acute ethmoiditis is a severe infection, requiring urgent diagnosis and treatment due to the risk of ophthalmic and endocranial complications. It occurs most frequently in children aged 2–3 years [9], such is the case of our presentation. It can be seen at an early age at six months and also in older children beyond five years. Acute ethmoiditis rarely diagnosed before its externalization. Its extension toward the orbit is done either by bone through the lamina papyracea, or by hematogenous dissemination. Orbital infection is the most common complication of ethmoiditis and may cause 91% of sinusitis complications in children [10]. Orbital involvement has been categorized into five stages by CHANDLER [8], of increasing severity. It evolves in two phases: the edematous phase dominated by the installation of a palpebral edema, includes stages 1 and 2 of CHANDLER, and the suppuration phase where the pains and general signs are increased, includes stages 3, 4, and 5 from CHANDER.

- Stage 1: Pre-septal cellulitis or inflammatory edema orbital, no ophthalmic sign.
- Stage 2: Diffuse orbital cellulitis, chemosis, and proptosis.
- Stage 3: Subperiosteal abscess, exophthalmos, oculomotor disorder (decreased eye movements), and reduced visual acuity.
- Stage 4: Orbital abscess, proptosis, significant drop in visual acuity, exaggerated oculomotor disorder, and mydriasis.
- Stage 5: Septic thrombosis of the cavernous sinus, contralateral ocular involvement, and meningeal syndrome.

Our case was classified stage 1 according to CHANDER. Palpebral edema is the warning sign, and is constant in most cases, often accompanied by nasopharyngeal infection in a context of fever [8, 11]. In addition, in our case, this edema extends to the nasal pyramid leading to its lateral deviation. The bacteriological investigation, during acute exteriorized ethmoiditis, is often disappointing during endonasal and nasopharyngeal samples, being non-sterile media [11]. The most interesting is that of subperiosteal or orbital abscesses. In our study, the sample was not taken. The biological assessment found hyperleukocytosis and increased CRP (inflammatory syndrome), as described in the literature. Computed tomography (CT) can confirm the diagnosis and detect any complications [3, 8, 9, 12, 13]. In our case, the child comes from a family of peasant parents, with a low socio-economic level, hence, access to certain explorations like CT scan is difficult. Major challenge to be met, to make healthcare accessible to all, even to the poor, in this case to the population of rural areas.

The treatment is essentially medical, sometimes surgical. In addition to analgesics, nasal wash, and sometimes corticosteroid; antibiotic therapy is probabilistic, combinations are preferred [8]. As in our clinical case Upile et al. used the association Cefotaxime

and Metronidazole intravenously as first intention, with good clinical evolution [14], although no unanimous consensus on the treatment. Antibiotic therapy is primarily parenteral, of variable duration depending on the clinical course, with a minimum of five days [8, 13]. The relay per os is done after amendment of the local and general signs. As for adjuvant corticosteroid therapy, a recent meta-analysis concluded that it shortens the duration of hospitalization, with faster reduction of inflammation without risk of exacerbating the infection [15].

CONCLUSION

Acute ethmoiditis remains an infantile pathology with multiple neighborhood and remote complications, including periorbital and endocranial cellulitis involving vital and visual prognosis. Early diagnosis must be a priority in clinical and imaging terms. Medical treatment consisting of adequate antibiotic therapy can reduce both local and remote infections. However, surgical treatment is reserved for CHANDLER stage 2, 3, 4, 5 infections. Hence the need for an attentive attitude toward all nasal discharge, a source of multiple neuro-ophthalmological and cerebral disorders.

REFERENCES

1. Kim BY, Bae JH. Role of systemic corticosteroids in orbital cellulitis: A meta-analysis and literature review. *Braz J Otorhinolaryngol* 2022;88(2):257–62.
2. Khan SA, Hussain A, Phelps PO. Current clinical diagnosis and management of orbital cellulitis. *Expert Review of Ophthalmology* 2021;16(5):387–99.
3. Nwaorgu OGB, Awobem FJ, Onakoya PA, Awobem AA. Orbital cellulitis complicating sinusitis: A 15-year review. *Nigerian Journal of Surgical Research* 2004;6(1–2):14–6.
4. Onakpoya OH, Adeoye AO, Akinpelu OV. Cost-related antibiotic dosage omissions-challenge for orbital cellulitis management in resource poor communities. *Orbit* 2009;28(2–3):147–52.
5. Wane AM, Ba EA, Ndoeye-Roth PA, et al. Senegalese experience of orbital cellulitis. [Article in French]. *J Fr Ophtalmol* 2005;28(10):1089–94.
6. Bekibele CO, Onabanjo OA. Orbital cellulitis: A review of 21 cases from Ibadan, Nigeria. *Int J Clin Pract* 2003;57(1):14–6.
7. Adeoti CO, Adejumo OO, Isawumi MA, Kolawole OO, Haastrup AA. Orbital cellulitis in a tertiary institution in Nigeria: Improving outcomes. *Niger J Ophthalmol* 2017;25:141–5.
8. François M. Ethmoïdes aiguës chez l'enfant. *EMC - Oto-rhino-laryngologie* 2008;3(1):1–7.
9. Oxford LE, McClay J. Complications of acute sinusitis in children. *Otolaryngol Head Neck Surg* 2005;133(1):32–7.
10. Ben Mabrouk A, Wannes S, Hasnaoui M, et al. Orbital complication of acute ethmoiditis: A Tunisian

- paediatric cross sectional study. *Am J Otolaryngol* 2020;41(1):102320.
11. Coudert A, Ayari-Khalfallah S, Suy P, Truy E. Microbiology and antibiotic therapy of subperiosteal orbital abscess in children with acute ethmoiditis. *Int J Pediatr Otorhinolaryngol* 2018;106:91–5.
 12. Klossek JM, Quinet B, Bingen E, et al. Current management of acute pediatric rhinosinusitis in France. [Article in French]. *Med Mal Infect* 2007;37(3):127–52.
 13. François M, Mariani-Kurkdjian P, Dupont E, Bingen E. Acute ethmoiditis in children, a series of 125 cases. [Article in French]. *Arch Pediatr* 2006;13(1):6–10.
 14. Upile NS, Munir N, Leong SC, Swift AC. Who should manage acute periorbital cellulitis in children? *Int J Pediatr Otorhinolaryngol* 2012;76(8):1073–7.
 15. Brook I. Bacteriology of acute and chronic ethmoid sinusitis. *J Clin Microbiol* 2005;43(7):3479–80.

Acknowledgments

We thank all who participated in the study. *Funding*: This research received no external funding.

Author Contributions

Thierry Mpengani – Conception of the work, Design of the work, Acquisition of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Aliocha N Nkodila – Conception of the work, Design of the work, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Gabriel Lema – Acquisition of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Mireille Ngale – Acquisition of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Lydie Kainda – Acquisition of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Charles Mbala – Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Richard N Matanda – Conception of the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Jérôme G Sokolo – Conception of the work, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

The corresponding author is the guarantor of submission.

Source of Support

None.

Consent Statement

Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

Copyright

© 2023 Thierry Mpengani et al. This article is distributed under the terms of Creative Commons Attribution License which permits unrestricted use, distribution and reproduction in any medium provided the original author(s) and original publisher are properly credited. Please see the copyright policy on the journal website for more information.

Access full text article on
other devices



Access PDF of article on
other devices





INTERNATIONAL JOURNAL OF CASE REPORTS AND IMAGES



VIDEO JOURNAL OF CLINICAL RESEARCH



VIDEO JOURNAL OF BIOMEDICAL SCIENCE



INTERNATIONAL JOURNAL OF HEPATOBILIARY AND PANCREATIC DISEASES



INTERNATIONAL JOURNAL OF BLOOD TRANSFUSION AND IMMUNOHEMATOLOGY



EDORIUM JOURNAL OF OPHTHALMOLOGY



Submit your manuscripts at
www.edoriumjournals.com



EDORIUM JOURNAL OF MEDICINE



EDORIUM JOURNAL OF CARDIOTHORACIC AND VASCULAR SURGERY



JOURNAL OF CASE REPORTS AND IMAGES IN ORTHOPEDICS AND RHEUMATOLOGY



EDORIUM JOURNAL OF PSYCHOLOGY



EDORIUM JOURNAL OF CELL BIOLOGY



JOURNAL OF CASE REPORTS AND IMAGES IN DENTISTRY



EDORIUM JOURNAL OF CANCER



EDORIUM JOURNAL OF PSYCHIATRY



JOURNAL OF CASE REPORTS AND IMAGES IN INFECTIOUS DISEASES



EDORIUM JOURNAL OF ANATOMY AND EMBRYOLOGY



EDORIUM JOURNAL OF SURGERY



JOURNAL OF CASE REPORTS AND IMAGES IN PATHOLOGY



EDORIUM JOURNAL OF ANESTHESIA