

Review Article

Diagnosis and Management of Orbital Cellulitis in a Reference Center in Senegal

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Abstract

The severity of orbital cellulitis is the risk of blindness and cerebro-meningeal complications that can be life-threatening. The objective of our study was to report the clinical, paraclinical, therapeutic and progressive aspects of orbital cellulitis. This was a retrospective, descriptive study over 5-year, from 1st January 2017 to December 31st 2021, in the ophthalmology department of Aristide le Dantec University Hospital. We glued 102 patients. The incidence was 32.8 cases per year. The average age was 23 years, the age group from 0 to 15 years was the most representative (49%). The most frequent reason for consultation was eyelid swelling (87%). There was a predominance of preseptal cellulitis (64%). An ORL etiology was found in 21.5% of cases. Orbital-cerebral CT was performed in 57 patients. It made this possible to classify cellulite and identify sinusitis in 21.6% of cases. All patients received antibiotics and corticosteroid therapy were combined 48 hours after the start of treatment in 41 patients. The evolution was favorable in 73.5% of cases. Ten patients (9.8%) presented a complication. We aim for 3 cases of blindness. Death occurred in a patient who presented a bilateral orbital cellulitis complicated by cavernous sinus thrombophlebitis. The prognosis depends on the delay in treatment, the stage of the disease and the existence of comorbidity factors.

Keywords: Orbital Cellulitis; Orbitocerebral CT; Antibiotic Therapy; Blindness

Introduction

Orbital cellulitis is an acute inflammatory orbital swelling of infectious origin [1]. Its severity is related to the risk of blindness and cerebro-meningeal complications that can endanger life prognosis [2]. Orbital-cerebral CT plays a fundamental role in diagnosis. It allows for lesion assessment, local cause investigation, disease classification and monitoring [3]. The aim of our study was to report the clinical, paraclinical, therapeutic and evolutionary aspects of orbital cellulitis at the Aristide Le Dantec University Hospital Center in Dakar.

Material and Methods

This was a descriptive retrospective study covering a period of 5 years from January 1, 2017, to December 31, 2021. It was conducted at the ophthalmological clinic of Aristide Le Dantec Hospital. Included in the study were all complete records of patients diagnosed and treated for orbital cellulitis. Records of patients with pseudo-orbital cellulitis secondary to orbital tumors were excluded. The collected data were recorded on an exploitation form with the aim of analyzing epidemiological, clinical, paraclinical, therapeutic and evolutionary data. Ophthalmological examination measured distance visual acuity when eyelid opening was possible. It looked for exophthalmos, limitation of ocular motility and corneal involvement. Fundoscopy was performed to search for compressive neuropathy. Cellulitis was preseptal in the case of inflammatory eyelid edema, with or without purulent collection, in the absence of exophthalmos and with favorable evolution under ambulatory treatment within

72 hours. In case of marked retroseptal cellulitis characterized by inflammatory exophthalmos, hospitalization, orbital-cerebral CT and inflammatory assessment were necessary. We considered a consultation delay of more than 3 days as late. Favorable evolution was considered when there was complete regression of symptoms after well-conducted treatment. It was considered unfavorable in case of persistence and/or worsening of symptoms or the occurrence of complications. Data collection and descriptive analysis were performed using SPSS 20 software.

Results

Epidemiological Aspects: We collected 102 records. The frequency was 1.69%. On average, there were 32.8 cases per year. The mean age was 23 years with extremes of 7 months and 83 years. Forty-nine percent of patients were under 14 years old. The sex ratio was 1.8. **Clinical Aspects:** The average consultation delay was 13 days with extremes of 1 to 60 days. It was late in 37% of cases (n=38). The most frequent reason for consultation was eyelid swelling in 87% of cases. Periorbital or retro-orbital pain was noted in 60% of cases. Fever was noted in 49.01% (n=50). One patient presented with confusion associated with seizures and headaches. Initial visual acuity was assessed urgently in 25.2% of patients (n=26). It was 10/10 in 27.5% of patients (n=28). There was a major decrease in visual acuity (<1/10) in 2.94% of cases (n=3). Palpebral edema was the main sign, present in all patients. It was associated with purulent eyelid collection in 6 patients. Inflammatory exophthalmos was found in 54 patients (52.94%). It was bilateral in one patient. Chemosis was associated in 47.05% of cases. Ophthalmoplegia was noted in 21.6% of patients. Exposure keratitis complicated by corneal abscess was observed in one patient. Fundoscopy revealed compressive optic neuropathy marked by grade 2 papillary edema in 2 patients (Table 1,2).

Paraclinical Aspects

Biology: Complete blood count found neutrophilic leukocytosis in 34.31% of cases (n=35). It averaged 17850 cells/mm³ with extremes of 11030 and 22600 cells/mm³. C-reactive protein levels were positive in 28.43% (n=29) ranging from 10 to 245 mg/l. Erythrocyte sedimentation rate at the first hour was positive in 27.45% of patients (n=28). Two blood cultures were negative. Fluid drainage culture was done in six patients and showed the presence of *Streptococcus pyogenes* in 2 patients and *Acinetobacter baumannii* in one patient.

Imaging

Orbital-cerebral CT was performed in 57 patients, accounting for 55.88% of cases. More than half, 64% of patients (n=48), had preseptal cellulitis. It revealed sinus involvement in 21.57% of cases, affecting 22 patients. It identified complications in 9.8% of cases (n=10), including cerebral empyema in 6 patients, cerebral abscess in 2 patients and panophthalmitis in 2 patients.

Entry Port

We found an entry port in 53 patients (51.96%). The most common origin was ENT, present in 22 patients (21.5%), dominated by sinusitis. Ophthalmological causes due to ocular-orbital trauma by sharp weapon or road accident were found in 9.8% of cases (n=10).

Therapeutic Management and Follow-Up

Medical management consisted of probabilistic antibiotic therapy, intravenous or oral, adapted according to age, clinical form and responsible germs. Fifty-nine patients (57.84%) were hospitalized and the rest were followed up on an outpatient basis. Treatment was initiated by injection and then switched to oral for hospitalized patients. It consisted of triple antibiotic therapy with Ceftriaxone (50 mg/kg/day), Gentamycin (5 mg/kg/day) and Metronidazole (20 mg/kg/day). Outpatient treatment involved oral amoxicillin-clavulanate (2 g/day). The average length of hospitalization was 13 days with extremes of 1 to 27 days. Corticosteroids (Prednisolone at 1 mg/kg/day) were administered in case of severe inflammation, in 40.19% of cases (n=41), after 48 hours of antibiotic therapy and a decrease in CRP. Twenty-one patients (20.58%) underwent surgical treatment, which consisted of drainage of an eyelid collection, puncture or abscess drainage. A patient with a refractory posterior subperiosteal abscess underwent drainage in the neurosurgery department. Eight spontaneous fistulas to the skin were observed. The evolution was favorable in 73.52% of cases (n=75), with improvement in inflammatory signs within an average of 10 days. Complications occurred in 10 patients (9.8%), including cerebral empyema in 6 patients, cerebral abscess in 2 patients and panophthalmitis in 2 patients. Blindness due to compressive optic atrophy was noted in 3 patients. One patient died from bilateral orbital cellulitis complicated by cavernous sinus thrombophlebitis. He was transferred to neurosurgical intensive care for better management.

Stages	Percentage (%)	n=Count
Stage I: Preseptal Cellulitis	47,06	48
Stage II: Orbital Cellulitis	25,5	26
Stage III: Subperiosteal Abscess	21,57	22
Stage IV: Intraorbital Abscess	4,9	05
Stage V: Cavernous Thrombosis	0,98	1

Table 1: Distribution of patients according the stage.

Causes		Count (n)	Percentage (%)
Sinusitis	Ethmoidal	6	5,88%
	Frontal	4	3,92%
	Maxillary	4	3,92%
	Sphénoïdal	1	0,98%
	Pansinusitis	7	6,86%
Orbital traumatism		6	5,88%
Complicated dacryocystitis		5	4,90%
Dental caries		15	14,70%
Dental abscess		5	4,90%

Table 2: Distribution of patients according to entry point.

Discussion

Orbital cellulitis can occur at any age, but the pediatric population remains the most exposed due to anatomical, immunological, environmental and physiological factors [4]. In a Senegalese series reported by Wane in 2005, the age group 0 to 15 years was the most representative with 31% of cases. In our series, it was 49% of cases [5]. The incidence of ocular cellulitis in children is decreasing since the introduction of the Haemophilus influenzae vaccine, which is the most frequently identified pathogen [6]. The mean consultation delay in our series was 13 days. Late consultation is the main risk factor for visual and intracranial complications [5,7]. The patient with cavernous sinus thrombophlebitis had a delay of 27 days. Preseptal cellulitis is the most frequent clinical form, as reported in several series ranging from 59% to 93% of cases [2,3,8-10]. It concerned 64% of our patients. In contrast to Kahloun's study which revealed a more frequent retroseptal form with 67% of patients [11]. In this form, inflammatory exophthalmos is the main sign. It is axial or non-axial, painful and irreducible. Bacteriological diagnosis is essential when the clinical context allows sampling either by blood culture or by pus sampling in case of eyelid or orbital collection. Gouéta and Wane found monomicrobial flora composed respectively of *Staphylococcus aureus* and *Streptococcus pyogenes* [5,12]. In our series, 2 blood cultures were negative and pus sampling showed *Streptococcus pyogenes* in 2 patients and *Acinetobacter baumannii* in one patient. The low positivity rate of samples could be related to the administration of emergency antibiotic therapy, which would reduce the identification of infectious agents. Medical imaging plays an important role in diagnosis, lesion assessment and monitoring. Orbital-cerebral CT with and without contrast injection is the gold standard. It allows good visualization of orbital content, sinus cavities and mucosa, adjacent structures and cerebro-meningeal complications [3]. It is not systematic in preseptal cellulitis where it reveals hyperdensity with thickening of soft tissues of the eyelid and face without orbital content involvement. The proximity of nasosinus cavities to the orbit and the optic nerve explains the ophthalmological complications of sinusitis. The starting point is mainly ethmoidal, less commonly maxillary and frontal [13]. According to Guilain, orbital-ocular complications of acute and chronic sinusitis are more frequent than endocranial complications and the severity of these infections lies in the risk of blindness due to optic nerve involvement [14]. We found a sinus origin in 39% of cases with a predominance of ethmoidal sinusitis. The therapeutic management of orbital cellulitis is based on parenteral or oral antibiotic therapy, sometimes supplemented with systemic corticosteroids [6]. Surgical treatment is reserved for complications. It consists of orbital decompression by draining orbital abscess, drainage of soft tissue abscess, sinus surgery and management of cerebral complications [3]. Orbital cellulitis can progress to complications and jeopardize visual function, leading to blindness. Blindness may be secondary to optic neuropathy, elevated intraorbital and/or inflammatory pressure or vascular origin by ischemia, central retinal artery occlusion or cavernous sinus thrombophlebitis. Chaudry reported blindness in 2.56% of cases and Belghmaïdi in 1.33% [2,4]. We found blindness in 1.96% of cases. Prognosis depends mainly on the time of care, the stage of the disease and the presence of comorbidities.

Conflict of Interests

The authors have no conflict of interest to declare.

References

1. Mouriaux F, Rysanek B, Babin E, Cattoir V. Orbital cellulitis. *J Fr Ophtalmol*. 2012;35(1):52-7.
2. Belghmaidi S, Belhoucha B, Hssaine K, Ibtissam H, Rochdi Y. Orbital cellulitis: A prospective study of 75 cases. *Pan Afr Med J*. 2015;22:340.
3. Bennani J. Contribution of computed tomography in orbital cellulitis. *J Neurol*. 2016;172(1):A32.
4. Chaudhry I, Al-Rashed W, Arat Y. The hot orbit: Orbital cellulitis. *Middle East Afr J Ophthalmol*. 2012;19(1):34-42.
5. Wane AM, Ba EA, Ndoeye-Roth PA, Kameni A, Demedeiros ME. A Senegalese experience of orbital cellulitis. *J Fr Ophtalmol*. 2005;28(10):1089-94.
6. Daoudi A, Ajdakar S, Rada N, Draiss G, Hajji I, Bouskraoui M. Orbital and periorbital cellulitis in children: Epidemiological, clinical, therapeutic, and evolutionary profile. *J Fr Ophtalmol*. 2016;39(7):609-14.
7. Ben Amor M, Khalifa Z, Romdhane N, Zribi S, Ben Gamra O. Orbital complications of sinusitis. *J Fr Ophtalmol*. 2013;36(6):488-93.
8. Ailal F, Bousfiha A, Jouhadi Z, Bennani M, Abid A. Orbital cellulitis in children: A retrospective study of 33 cases. *Med Trop*. 2004;64:359-62.
9. Georgakopoulos CD, Eliopoulou MI, Stasinou S, Exarchou A, Pharmakakis N, Varvarigou A. Periorbital and orbital cellulitis: a 10-year review of hospitalized children. *Eur J Ophthalmol*. 2010;20(6):1066-72.
10. Mekni M, Sayadi J, Choura R, Fekih A, Gouider D. Orbital cellulitis: Diagnostic, therapeutic, and prognostic approach in a reference center in Tunis, Tunisia (a retrospective study of 109 cases). *Pan Afr Med J*. 2022;43:64.
11. Kaloun R, Abroug N, Abdesslem N, Kssia I. Orbital infections: A study of 28 cases. *Tunis Med*. 2015;93(11):673-6.
12. Gouéta A, Lallogo S, Sanou E, Gyébré Y, Ouédraogo B. Orbital cellulitis in ENT: A study of 75 cases. *Rev SOAO*. 2020;1:21-6.
13. Serghini I, Moqqadem AE, Bellasri S, Laayoune J, Hamama J. Orbital cellulitis complicating acute pansinusitis: A case report. *Pan Afr Med Jr*. 2015;22:321.
14. Peytral C, Chevalier E. Ophthalmological complications in otorhinolaryngological pathology. *EMC-Oto-rhino-laryngologie*. Paris: Elsevier. 2004;1(3):199-224.

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