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Case Report

Panophthalmitis Caused by *Streptococcus pneumoniae* Complicated by Preseptal Cellulitis: A Case Report

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Abstract

Panophthalmitis is a rare but formidable infection involving all ocular structures, often with a fulminant course and a severe visual prognosis. We report a case of *Streptococcus pneumoniae* panophthalmitis complicated by preseptal cellulitis in a monitored glaucoma patient, requiring urgent medical and surgical management.

Keywords: *Panophthalmitis; Streptococcus pneumoniae; Preseptal Cellulitis; Antibiotic Therapy; Evisceration*

Introduction

Panophthalmitis is a diffuse purulent infection affecting all layers of the eyeball, usually secondary to uncontrolled endophthalmitis or severe exogenous inoculation [1]. Although *Streptococcus pneumoniae* is a rare cause, it remains a formidable pathogen due to its necrotizing potential and rapid progression [2]. We report a case of *S. pneumoniae* panophthalmitis complicated by preseptal cellulitis, in order to highlight the severity and therapeutic particularities of this condition.

Case Report

This is the case of Mr. A.M., a 68-year-old patient living in Kenitra, who has had bilateral glaucoma since 2018, and who had undergone cataract surgery in the right eye (2019) and the left eye (2008).

On April 4, 2023, the patient developed acute pain, redness, and eyelid swelling of the right eye. Empirical treatment with topical and oral fluoroquinolones was prescribed, with no improvement. He consulted on April 11, 2023, at the Ophthalmology Department of the Mohammed V Military Teaching Hospital in Rabat.

Clinical examination revealed visual acuity reduced to no light perception, marked eyelid swelling, and conjunctival hyperemia with edema. The cornea showed a 1.5 mm purulent perforation with pus leakage. A diagnosis of panophthalmitis was established (Figure 1 and 2).

Figure 1: *Right eye before irrigation.*

Figure 2: *Right eye after irrigation.*

The orbito-cerebral CT scan revealed right preseptal cellulitis with a palpebral abscess collection.

A corneal sample was sent to the laboratory for bacteriological analysis. Direct examination after Gram staining showed a marked inflammatory reaction characterized by numerous neutrophils and an abundant monomorphic bacterial flora composed of Gram-positive cocci arranged in chains and diplococci.

The specimen was inoculated onto blood agar and chocolate-polyvitex agar and incubated at 37°C with 10% CO_2.

After 24 hours of incubation, the culture yielded *Streptococcus pneumoniae*. Antibiotic susceptibility testing showed a wild-type sensitivity profile according to EUCAST 2022 recommendations (Table 1).

Antibiotic	Diameter (mm)	Interpretation
Oxacillin	20	Susceptible
Penicillin G	25	Susceptible
Ampicillin	32	Susceptible
Ceftriaxone	-	Susceptible
Norfloxacin	26	Susceptible
Levofloxacin	32	Susceptible
Moxifloxacin	32	Susceptible
Erythromycin	35	Susceptible
Clindamycin	32	Susceptible
Rifampicin	34	Susceptible
Tetracycline	15	Resistant
Vancomycin	24	Susceptible
Teicoplanin	21	Susceptible

Table 1: *Antibiotic susceptibility profile of S. pneumoniae.*

The treatment initiated combined systemic antibiotic therapy with ceftriaxone, vancomycin, and metronidazole, along with local therapy consisting of fortified vancomycin and ceftazidime eye drops, in addition to multiple daily ocular irrigations. Despite this appropriate and targeted management, the clinical course was unfavorable, with both functional and anatomical loss of the eyeball, necessitating evisceration.

Discussion

Post-infectious panophthalmitis is an ophthalmologic emergency of utmost severity, characterized by a suppurative inflammation involving all intraocular and periocular structures. It often represents the final stage of uncontrolled endophthalmitis. The microorganisms most frequently implicated are *Staphylococcus aureus* and *Pseudomonas aeruginosa*, both known for their virulence and ability to cause rapid tissue destruction, whereas *Streptococcus pneumoniae* remains a less common but nonetheless significant etiologic agent [3,4]. This organism is typically associated with upper respiratory infections, such as sinusitis or acute otitis media [5], which may serve as a source of hematogenous spread. However, it can also be isolated following ocular surgical procedures, penetrating trauma, or perforated keratitis, as reported in several cases in the literature.

From a pathophysiological standpoint, the infection is characterized by rapid dissemination of the pathogen throughout all ocular structures, facilitated by the rich vascular supply of the uvea and the absence of an effective anatomical barrier between the different compartments of the eye [6]. This fulminant progression leads to necrotic destruction of ocular tissues and irreversible loss of visual function, sometimes within only a few hours. In our case, panophthalmitis appears to have been of postoperative exogenous origin, occurring after cataract surgery, with preseptal extension indicating severe locoregional spread.

Diagnosis relies primarily on a combined clinical and paraclinical approach. Ophthalmologic examination typically reveals marked eyelid edema, conjunctival hyperemia, corneal opacification, and often absence of light perception. Orbital imaging-particularly orbito-cerebral CT scan-helps confirm the inflammatory extension to periocular tissues and rule out isolated orbital cellulitis. Identification of the pathogen through microbiological examination of corneal, aqueous, or vitreous samples is a key diagnostic component, guiding therapeutic management [7].

The treatment of panophthalmitis is based on broad-spectrum empirical antibiotic therapy covering both Gram-positive and Gram-negative organisms, administered systemically, intravitreally, or sometimes subconjunctivally. This therapy is then adjusted according

to antibiotic susceptibility results in order to optimize antimicrobial coverage and limit the risk of resistance [8]. In advanced forms, or in cases of unfavorable progression despite appropriate medical treatment, radical surgical intervention (evisceration or enucleation) becomes necessary to prevent the spread of infection and to relieve pain.

Despite appropriate antibiotic therapy, the clinical course in our patient was unfavorable, underscoring the formidable prognosis of this infection even under optimal treatment. This dramatic outcome highlights the importance of early diagnosis, prompt multidisciplinary management, and strict postoperative monitoring after any intraocular surgery to prevent progression to destructive panophthalmitis.

Conclusion

Streptococcus pneumoniae panophthalmitis remains a severe condition, threatening visual-and at times life-prognosis. Early diagnosis and initiation of treatment are essential. Prevention relies on careful monitoring of prior ocular infections and corneal injuries.

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