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White-Eye Presentation of Endogenous Klebsiella pneumoniae Endophthalmitis with a Choroidal Abscess Secondary to Colorectal Sepsis: A Case Report

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Short Report

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Abstract

Purpose:

Endogenous endophthalmitis is sight-threatening and commonly produces marked ocular inflammation. *Klebsiella pneumoniae* endogenous endophthalmitis is classically associated with pyogenic liver abscess, whereas colorectal sources and externally quiet presentations are rarely reported. We describe culture-positive multidrug-resistant *K. pneumoniae* endogenous endophthalmitis with a clinically diagnosed choroidal abscess secondary to colorectal sepsis.

Method:

Brief report.

Results:

A 58-year-old man with stage IV rectal adenocarcinoma, tumour perforation and a *K. pneumoniae*-positive retroperitoneal abscess presented with painless visual deterioration in the left eye. Visual acuity was 6/9 in the right eye and hand movements in the left. Examination of the right eye was otherwise normal. The left eye appeared externally white, without conjunctival injection or lid swelling, despite hypopyon, fibrin and dense vitritis. B-scan ultrasonography showed vitreous loculations, an 11.07-mm dome-shaped choroidal elevation and exudative retinal detachment. *K. pneumoniae* was isolated from the retroperitoneal abscess, blood and vitreous, supporting haematogenous dissemination. He received four intravitreal injections of vancomycin and ceftazidime with intravenous ceftriaxone. Repeat ultrasonography after two weeks showed persistent vitreous loculations but resolution of the choroidal elevation and a flat retina. Vision deteriorated to no perception of light, systemic instability precluded vitrectomy, and the patient died approximately five weeks later.

Conclusion:

An externally quiet white eye can conceal severe *K. pneumoniae* endogenous endophthalmitis. Acute visual deterioration in a septic or immunocompromised patient warrants urgent posterior-segment assessment, vitreous sampling, intravitreal antimicrobial therapy and systemic source control. Visual prognosis remains guarded despite prompt ocular and systemic antimicrobial treatment.

Introduction

Endogenous endophthalmitis (EE) is a sight-threatening intraocular infection caused by haematogenous dissemination from a distant focus and accounts for approximately 2–8% of all endophthalmitis cases [1]. Microbial patterns vary geographically; Gram-negative organisms, particularly *Klebsiella pneumoniae*,

are prominent causes in East and Southeast Asia and are associated with poor visual outcomes [2, 6]. Hypervirulent *K. pneumoniae* (hvKp) is increasingly recognised for its propensity to cause invasive metastatic infection, including EE, while antimicrobial resistance among *K. pneumoniae* strains represents an emerging therapeutic challenge [3]. *K. pneumoniae* EE is classically associated with pyogenic liver abscess, whereas colorectal sources are rarely reported [4].

Severe endophthalmitis commonly produces marked ocular inflammation, but minimal external signs may delay recognition. Diagnostic uncertainty is compounded when a choroidal elevation occurs in a patient with metastatic malignancy. We report culture-positive multidrug-resistant *K. pneumoniae* EE with a clinically diagnosed choroidal abscess presenting as a “white eye”, secondary to perforated rectal carcinoma and a *K. pneumoniae*-positive retroperitoneal abscess. This case highlights the need for prompt posterior-segment assessment and vitreous sampling in septic or immunocompromised patients with acute visual deterioration, even without conjunctival injection.

Case Report

A 58-year-old man presented with a one-day history of floaters followed by progressive, painless blurring of vision in the left eye. He had stage IV rectal adenocarcinoma with hepatic and pulmonary metastases. Four weeks earlier, perforation of the rectal tumour complicated by a retroperitoneal abscess had required laparotomy, abscess drainage and colostomy. Culture of the retroperitoneal abscess yielded *K. pneumoniae*.

On examination, visual acuity (VA) was 6/9 in the right eye and hand movements in the left eye. The left eye appeared white externally, without conjunctival injection or lid swelling (Fig. 1A). Slit-lamp examination revealed 4 + anterior chamber cells, an inferior hypopyon and fibrin over the anterior lens capsule (Fig. 1C). Fundus view was obscured by dense vitritis. B-scan ultrasonography demonstrated vitreous loculations, a dome-shaped choroidal elevation measuring 11.07 mm and exudative retinal detachment, supporting the clinical diagnosis of a choroidal abscess (Fig. 1B).

An urgent vitreous tap yielded purulent material and was followed by intravitreal vancomycin (1 mg/0.1 mL) and ceftazidime (2.25 mg/0.1 mL). Gram staining demonstrated Gram-negative bacilli, and culture yielded two low-count, laboratory-reported isolates—*K. pneumoniae* and *K. pneumoniae subsp. ozaenae* (each < 15 colony-forming units)—both designated multidrug resistant.

Vitreous sample isolates were resistant to amoxicillin-clavulanate, ampicillin, ampicillin-sulbactam, ciprofloxacin and piperacillin-tazobactam, but susceptible to ceftazidime and cefuroxime. Blood cultures obtained during febrile episodes and the retroperitoneal abscess culture yielded *K. pneumoniae*. Blood and vitreous susceptibility profiles were concordant for agents tested in common, supporting haematogenous dissemination. Direct KOH microscopy and PAS/GMS stains were negative for fungal elements. Together with the clinical and B-scan findings, these results supported a clinical diagnosis of endogenous *K. pneumoniae* endophthalmitis with choroidal abscess secondary to colorectal sepsis.

The patient received four intravitreal injections of vancomycin (1 mg/0.1 mL) and ceftazidime (2.25 mg/0.1 mL) over two weeks. Intravenous ceftriaxone 2 g once daily was initiated under infectious-disease supervision to address the systemic source of infection. Topical fortified antibiotics (vancomycin 5% and ceftazidime 5%) were commenced, and topical corticosteroids were subsequently added once antimicrobial therapy had been established. Cycloplegic agents were prescribed for comfort. On treatment Day 7, the hypopyon had resolved; however, anterior chamber fibrin persisted and was more extensive than at presentation (Fig. 1D).

Repeat B-scan ultrasonography two weeks after presentation showed persistent vitreous loculations, no residual choroidal elevation and a flat retina. On treatment Day 21, after four intravitreal injections, the left eye showed procedure-related subconjunctival haemorrhage and a hazy, oedematous cornea; the anterior chamber was quiet, with no residual hypopyon or fibrin (Fig. 1E). Despite ongoing intravitreal and systemic therapy, posterior-segment inflammation persisted and vision deteriorated to no perception of light (NPL). Pars plana vitrectomy was considered; however, following multidisciplinary assessment, the patient was deemed systemically unfit for surgery because of advanced metastatic disease and ongoing sepsis. The fellow eye remained unaffected. The patient's systemic condition subsequently worsened, and he died approximately five weeks later.

Discussion

Endophthalmitis commonly presents with pain, redness, visual loss and ocular inflammation; however, a white or externally quiet eye does not exclude severe endogenous infection [1, 5]. In our patient, absent conjunctival injection and lid swelling despite hypopyon, fibrin and dense vitritis created a clinically important 'white-eye' diagnostic mismatch. The differential diagnosis of an endophthalmitis-like presentation includes noninfective uveitis and intraocular malignancy. Choroidal metastasis remained relevant given the metastatic rectal adenocarcinoma. Nevertheless, the initial dome-shaped choroidal elevation on B-scan, culture-positive endogenous *K. pneumoniae* endophthalmitis and systemic *K. pneumoniae* infection supported choroidal abscess as the leading clinical diagnosis. Repeat B-scan two weeks later showed resolution of the choroidal elevation following antimicrobial treatment, further favouring an infectious abscess over choroidal metastasis. Serial B-scan ultrasonography may therefore assist diagnostic assessment when direct sampling of the choroidal lesion is not feasible. Taken together, the microbiological findings and interval ultrasonographic resolution strongly supported the clinical diagnosis of choroidal abscess, although the absence of histopathological sampling meant that metastasis could not be excluded with certainty.

Previous studies have established the poor visual prognosis of *K. pneumoniae* EE and recognised ocular abscess formation as an important manifestation [6–8]. Chen et al. found that poor presenting vision and *K. pneumoniae* infection were associated with poor visual outcome [6]. Zhu et al. reported four liver-abscess-associated cases in which all affected eyes underwent evisceration [7]. In a study of three institutional cases and a literature review of 50 eyes with *K. pneumoniae* subretinal abscess, Montrisuksirikun et al. identified delayed diagnosis, poor initial vision, severe vitritis and macular

involvement as adverse prognostic features [8]. These studies predominantly describe *K. pneumoniae* EE associated with liver or subretinal abscesses and emphasise its poor outcomes. Our case addresses a different diagnostic and aetiological scenario: severe culture-positive EE with a clinically diagnosed choroidal abscess in an externally quiet eye arising from a microbiologically supported colorectal and retroperitoneal source.

Although pyogenic liver abscess is the classical source of *K. pneumoniae* EE, Mak et al. described *Klebsiella* endophthalmitis revealing occult colorectal carcinoma [4]. In our patient, the perforated rectal carcinoma and *K. pneumoniae*-positive retroperitoneal abscess provided a plausible colorectal source. Isolation of *K. pneumoniae* from the retroperitoneal abscess, blood and vitreous, with concordant blood and vitreous susceptibility profiles for agents tested in common, strongly supported haematogenous dissemination. The vitreous isolates were reported as multidrug resistant, with resistance to multiple agents while remaining susceptible to ceftazidime and cefuroxime. This resistance profile narrowed the available antimicrobial options and reinforced the importance of susceptibility-guided antimicrobial selection. Together, the resistant phenotype and multisite infection highlight both the therapeutic challenge and invasive potential of *K. pneumoniae*.

Management of EE requires prompt vitreous sampling and intravitreal antimicrobial therapy, together with identification and treatment of the systemic source [1, 5]. Our patient received repeated intravitreal vancomycin and ceftazidime with systemic ceftriaxone. Pars plana vitrectomy was considered for persistent posterior-segment inflammation; however, systemic instability from advanced metastatic disease and ongoing sepsis precluded surgical intervention. Although the hypopyon, fibrin and choroidal elevation resolved, vitreous loculations persisted and vision deteriorated to NPL, illustrating the guarded visual prognosis of severe infection. This case emphasises that an externally quiet eye should not delay posterior-segment assessment and microbiological sampling in septic or immunocompromised patients with acute visual deterioration. Multidisciplinary management is essential, although the opportunity for ocular surgery may be limited by the patient's systemic condition.

Conclusion

This case highlights that an externally quiet "white eye" can conceal severe culture-positive multidrug-resistant *Klebsiella pneumoniae* endogenous endophthalmitis with a clinically diagnosed choroidal abscess. Isolation of *K. pneumoniae* from the retroperitoneal abscess, blood and vitreous provided strong microbiological evidence of haematogenous dissemination from colorectal sepsis and identifies an important source beyond the classical pyogenic liver abscess. In septic or immunocompromised patients, acute visual deterioration warrants urgent posterior-segment assessment and vitreous sampling even when conjunctival injection is absent. Intravitreal antimicrobial therapy and simultaneous treatment of the systemic source are essential. Although the anterior inflammation and choroidal elevation resolved, vitreous disease persisted and vision deteriorated to NPL. Systemic instability may preclude vitrectomy; early coordinated multidisciplinary management is therefore critical, although the visual prognosis remains guarded.

Declarations

Ethics approval and consent to participate

Institutional ethics approval was not required for this single-patient case report. Consent to participate was not applicable.

Consent for publication

Written informed consent for publication was obtained from the patient and a relative, including consent for the use of clinical details, images and audiovisual material.

Competing interests

The authors declare that they have no competing interests.

Use of artificial intelligence

OpenAI Codex (GPT-5; OpenAI) was used to support language refinement, clarity, organisation and journal formatting. The authors reviewed and verified the final manuscript and references and take full responsibility for the accuracy, originality and integrity of the submitted work. No artificial intelligence was used to generate or modify the clinical images.

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Author Contribution

INI collected the clinical data, reviewed the literature and drafted the original manuscript. NK contributed to patient management and supervised the work. FI conceived the case report, contributed to patient management, reviewed and edited the manuscript, and supervised the work. All authors read and approved the final manuscript.

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Availability of data and materials

All data supporting this case report are included within the article.

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Figures

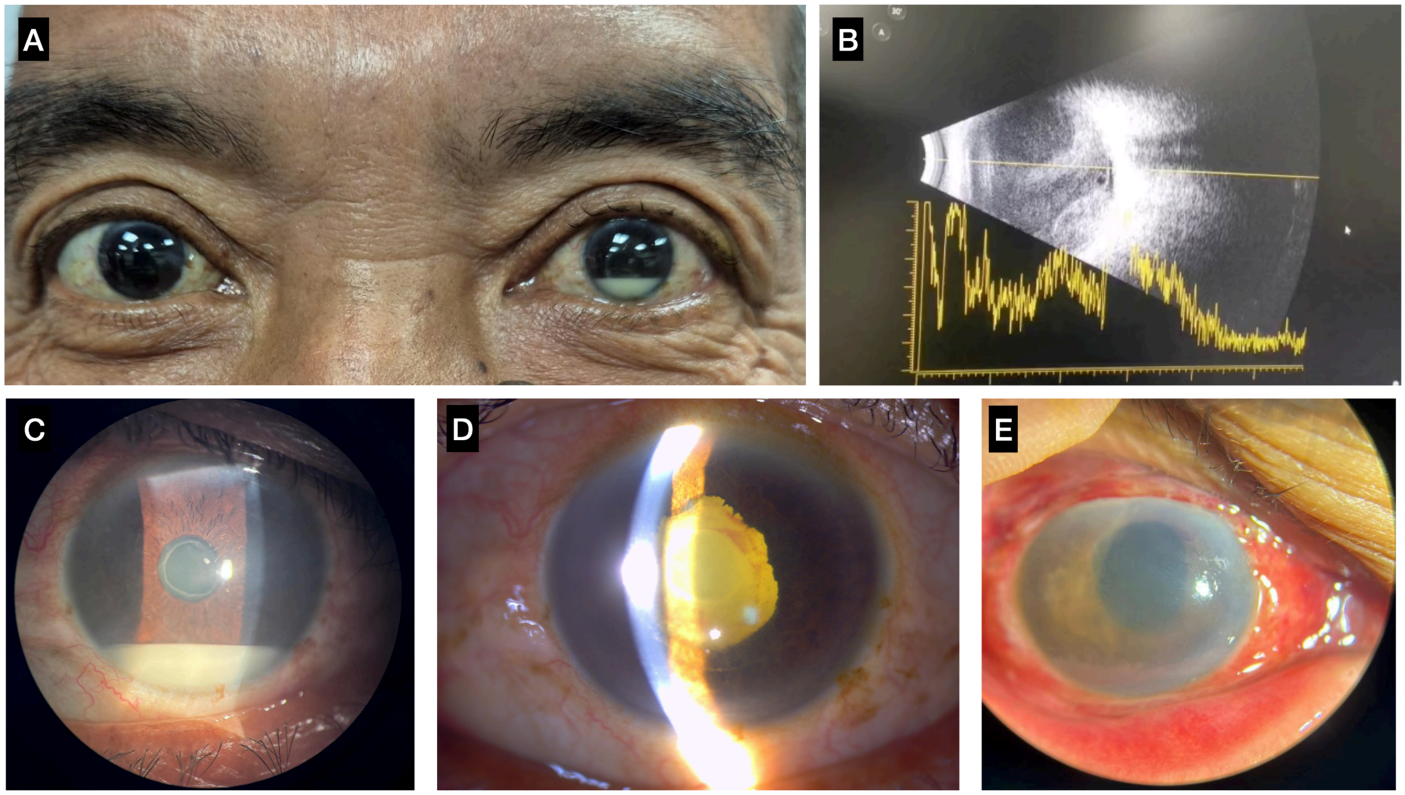


Figure 1

Serial clinical and ultrasonographic course of endogenous Klebsiella pneumoniae endophthalmitis from presentation to treatment Day 21. (A) External photograph of the left eye at presentation showing a visible hypopyon despite the absence of conjunctival injection and a quiet external appearance. (B) B-scan ultrasonography with an A-scan trace demonstrating dense vitreous echoes with loculations, a dome-shaped choroidal elevation with medium-to-high internal reflectivity and associated exudative retinal detachment, suggestive of a choroidal abscess. (C) Anterior-segment photograph at presentation showing hypopyon with fibrin deposition over the anterior lens capsule. (D) Anterior-segment photograph on treatment Day 7 showing resolution of the hypopyon with persistent anterior chamber fibrin. (E) Anterior-segment photograph on treatment Day 21, following four intravitreal injections, showing procedure-related subconjunctival haemorrhage and corneal haze, with a quiet anterior chamber and no residual hypopyon or fibrin.