JAMA Ophthalmology Clinical Challenge

Bilateral Hypopyon in a Young Woman

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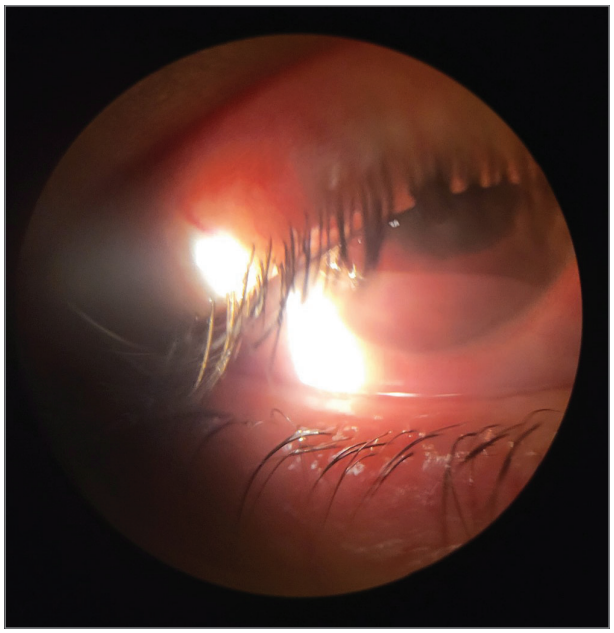

Figure 1. A 2.5-mm pseudohypopyon in the right eye due to leukemic infiltrate.

A 28-year-old woman presented to the emergency department with a 5-day history of bilateral blurry vision, eye redness, discharge, photophobia, and pain. She also reported rhinorrhea and lethargy. Her medical history included Leber congenital amaurosis treated with voretigene neparvovec (Luxturna; Spark Therapeutics) 8 years ago, and acute myeloid leukemia (AML) diagnosed 6 months prior to presentation treated with cytarabine and idarubicin. Her latest chemotherapy was 3 weeks before presentation, and a peripherally inserted central catheter (PICC) was removed 2 weeks ago. A complete blood cell count was ordered, revealing anemia, neutropenia, lymphocytopenia, and monocytopenia in the setting of recent chemotherapy. Blood cultures were drawn, and results were pending at the time of presentation.

Her ophthalmic examination showed visual acuity of 20/800 OD and 20/400 OS, decreased from her baseline of 20/200 OU. Intraocular pressures were 37 mm Hg OD and 31 mm Hg OS. Slitlamp examination revealed chemosis, conjunctival hyperemia, and microcystic corneal edema bilaterally. There were more than 20 cells per high-power field of 1 mm × 1 mm beam, with fibrin bilaterally and 2.5-mm hypopyon in the right eye and 2.7-mm hypopyon in the left eye (**Figure 1**). Posterior segment examination was limited because of corneal edema and anterior inflammation, but there were no vitreous opacities on B-scan ultrasonography.

WHAT WOULD YOU DO NEXT?

A. Observe, as this is expected inflammation after voretigene neparvovec gene therapy

B. Perform pars plana vitrectomy

C. Obtain a sample of the hypopyon through anterior chamber paracentesis and inject intravitreal antibiotics

D. Await results from systemic laboratory tests and blood culture

Quiz at jamacmelookup.com

Diagnosis

Bilateral anterior uveitis with pseudohypopyon in the setting of AML infiltration

What to Do Next

C. Obtain a sample of the hypopyon through anterior chamber paracentesis and inject intravitreal antibiotics

Discussion

This is a case of AML relapse with bilateral pseudohypopyon. A hypopyon forms when white exudate collects in the inferior aspect of the anterior chamber (AC). When a hypopyon consists of neoplastic cells, the term *pseudohypopyon* is used. However, the appearance is identical to a hypopyon resulting from suppurative infection or inflammation.[1] In this patient, AC aspiration was done and

showed malignant cells (**Figure 2**), confirming AML relapse with monocytic differentiation.

Leukemia accounts for 34.8% of ocular metastases affecting the retina, choroid, optic nerve, vitreous, iris, and AC.[2] Acute leukemias present more frequently with ocular manifestations than in chronic leukemias,[3] with ocular involvement ranging from 32% to 35.5%.[4] Ocular involvement of the anterior segment specifically due to acute lymphocytic leukemia relapse ranges from 2.5% to 18%, while anterior involvement in AML relapse is very rare.[1]

The differential diagnosis for hypopyon includes 4 broad categories: noninfectious inflammation, infectious, neoplastic, and corneal etiologies.[1] Noninfectious causes include uveitis, most commonly HLA B-27–associated or Behçet disease–associated inflammation, and postsurgical or medical-induced inflammation, such as with rifabutin.[5] Infectious causes can be exogenous with postsurgical or traumatic inoculation or endogenous, such as endogenous endophthalmitis from hematological spread. Hypopyon due to neoplasia can be caused by leukemia, lymphoma, retinoblastoma, melanoma, or metastases. Finally, corneal etiologies include microbial keratitis or noninfectious chemical or traumatic injuries. Recognition on physical examination and proper investigation is crucial for correct diagnosis and treatment, as hypopyon usually occurs with specific conditions rather than as a universal ocular inflammatory response.[1]

Option C, perform AC aspiration (as this can detect neoplastic cells) and inject intravitreal antibiotics, is the correct next step.[6-8] Although rare, given this patient's history of AML, suspicion for infiltrative pseudohypopyon as a mimicker of reactive intraocular inflammation should be raised. However, this patient is immunocompromised with a recent PICC, so an infectious process must be kept on the differential. Broad-spectrum intravitreal antibiotics, such as vancomycin and ceftazidime, should be injected until AC aspiration results return, as the consequences of untreated endophthalmitis are severe.[8]

Option A is incorrect. A 2022 study has shown that ocular inflammation can occur in the weeks following subretinal administration of voretigene neparvovec gene therapy[9]; however, this patient underwent treatment years ago. Option B, perform vitrectomy, is incorrect as there is not evidence of posterior segment inflammation, the patient's vision does not meet criteria by the Endophthalmitis Vitrectomy Study, and there are less invasive methods for specimen evaluation. Endophthalmitis can occur in the setting of a blood-borne infection, but awaiting systemic laboratory tests and blood culture results, option D, would not help distinguish between AML pseudohypopyon vs endophthalmitis and would delay endophthalmitis treatment. Additionally, it has been suggested that leukemic pseudohypopyon can be associated with relapse even if leukemia is not systemically detected.[10]

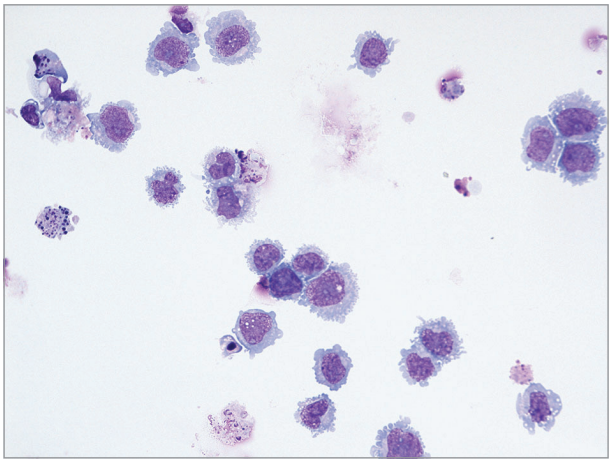

Figure 2. Cytology of anterior chamber aspirate showing malignant cells confirming intraocular relapse of acute myeloid leukemia (Giemsa stain, original magnification ×40).

Patient Outcome

The patient was admitted and started venetoclax combined with fludarabine, cytarabine, and idarubicin chemotherapy and received low-dose 1400 cGy involved-field radiotherapy to the eyes for 1 week. Over a few days of radiotherapy, the hypopyon fully resolved along with improved pain and visual acuity to 20/400 OD and 20/200 OS.

ARTICLE INFORMATION

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Published Online: April 20, 2023. doi:10.1001/jamaophthalmol.2023.0939

Conflict of Interest Disclosures: This research was supported, in part, by the UCSF Vision Core shared resource of National Eye Institute grant P30 EY002162 and the Research to Prevent Blindness unrestricted grant.

Additional Contributions: We thank the spouse of the patient for granting permission to publish this information. We thank Aaron Logan, MD, PhD (Department of Hematology Oncology, University of California, San Francisco), Scott Kogan, MD (Department of Pathology and Laboratory Medicine, University of California, San Francisco), and Rama Yakubu, MD, PhD (Department of Pathology and Laboratory Medicine, University of California, San Francisco), for acquisition, analysis, and interpretation of the cytopathologic results in caring for this patient as well as for providing the photomicrograph shown in this report. We also thank Jacque Duncan, MD (Department of Ophthalmology, University of California, San Francisco), and Albert Maguire, MD (Department of Ophthalmology, Scheie Eye Institute, University of Pennsylvania, Philadelphia), for their clinical care. These contributors were not compensated beyond their regular clinical duties.

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