Primary Vitreoretinal Lymphoma Presenting as a Posterior Capsule Plaque

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Albini et al. show a fascinating video illustrating a unique finding – a nearly opaque posterior capsular plaque that developed in the eye of a pseudophakic woman who, several years previously, underwent a diagnostic vitrectomy in the same eye for suspected intraocular lymphoma. The earlier biopsy and brain MRI were negative for malignancy. This capsular biopsy was positive for B-cell lymphoma, and repeat MRI showed new central nervous system (CNS) lesions consistent with CNS lymphoma. Although the vitreous, subretinal space, sub-retinal pigment epithelium (RPE) space, and optic nerve are known sites for intraocular lymphoma cells to accumulate, the posterior capsule is highly unusual.


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An initial negative vitreous biopsy in the setting of intraocular lymphoma is not unusual. Persistence by the ophthalmologist in the pursuit of the diagnosis of primary intraocular lymphoma is often necessary. Multimodal imaging consisting of fluorescein angiography and fundus autofluorescence looking for "leopard spots" and subtle arterial leakage, as well as optical coherence tomography to detect subretinal and sub-RPE abnormalities, can be helpful in cases where the fundus appears normal. Other confirmatory studies may include systemic evaluation, neuroimaging, lumbar puncture, and multiple sampling of intraocular tissue.

This video illustrates several important points: 1) Use of a 6-mm cannula when the view is suspect; 2) confirmation of the presence of the cannula in the vitreous cavity prior to beginning infusion; 3) obtaining an undiluted specimen by the infusion of air as opposed to saline to maintain intraocular pressure while not diluting the specimen; and 4) use of small-gauge vitrectomy instrumentation to obtain a cytologic specimen.

Since cytology remains the best way to diagnose intraocular lymphoma, proper handling of the biopsy specimen is critical. Discussing these details with an ocular pathologist prior to the biopsy is recommended. This case also illustrates that using small-gauge vitrectomy instrumentation does not result in untoward surgical trauma on the cells as some feared initially with the advent of the smaller port cutters and higher cutting rates.

In summary, primary vitreoretinal lymphoma is the ultimate cause of the masquerade syndrome and should be kept in mind as a potential diagnosis in the proper clinical setting, even when prior vitreous biopsies are negative. Persistence in obtaining the correct diagnosis is necessary. Although highly unusual, this case illustrates that lymphoma cells can accumulate as a posterior capsular plaque in the setting of a pseudophakic, prior vitrectomized eye.

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ABSTRACT: Primary vitreoretinal lymphoma (PVRL) can be a diagnostic challenge and commonly presents as a partially steroid-responsive vitritis or as subretinal cream-colored infiltrates. The authors present a patient with PVRL who initially presented with bilateral vitritis; however, after two non-diagnostic vitrectomy specimens and two unremarkable brain MRIs, she was lost to follow-up. She presented 2.5 years later with a white plaque on the posterior capsule of her left intraocular lens, though the vitreous cavity was free of infiltrate. Repeat biopsy revealed diffuse large B-cell lymphoma, and brain MRI demonstrated an enhancing lesion of the cerebellum, consistent with primary central nervous system lymphoma.

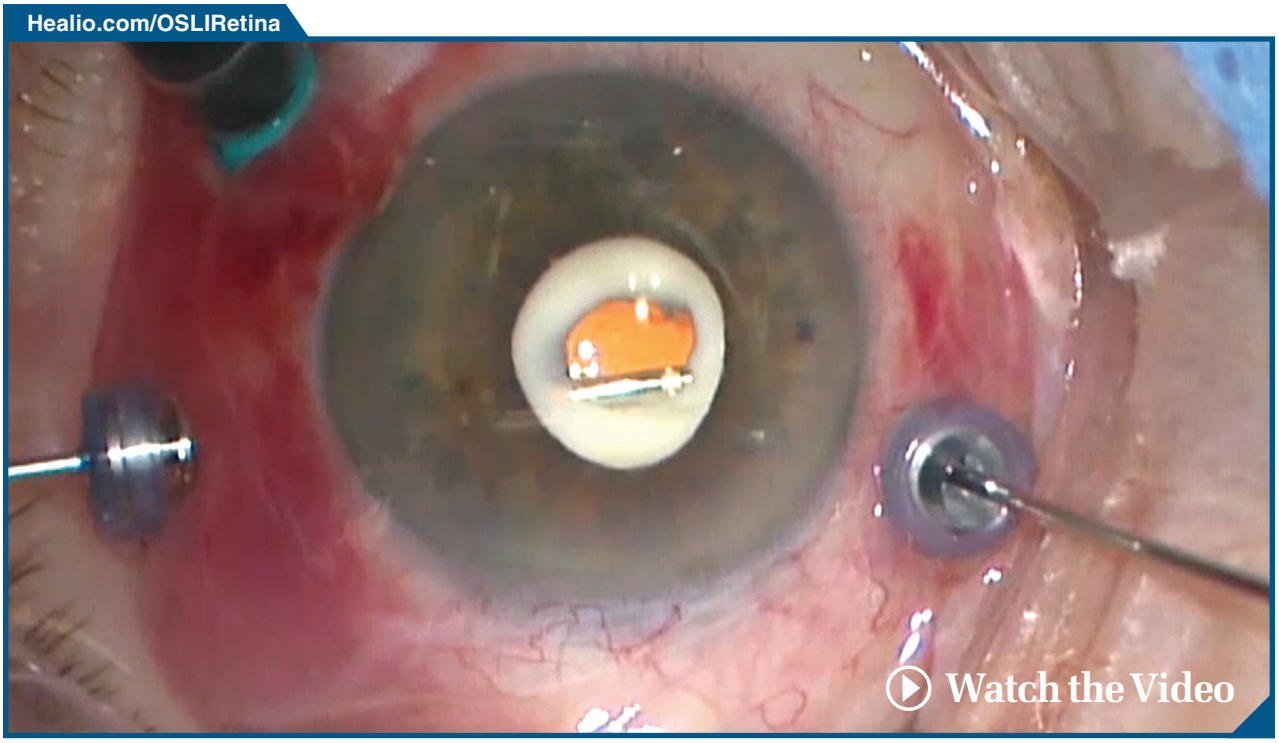
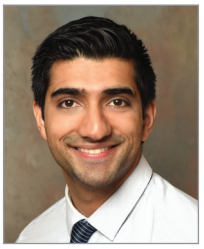


Figure. This screenshot demonstrates the vitreous cutter aspirating the lymphoma lesion from the posterior capsule of the intraocular lens. Due to the poor view, a 6-mm infusion cannula was used to ensure that the infusion had penetrated into the vitreous cavity. In order to obtain a non-dilute sample, the vitreous cavity was infused with air instead of balanced salt saline.

A woman in her 70s presented with gradually worsening floaters bilaterally. Best-corrected visual acuity was 20/25 in the right eye and 20/20 in the left eye. Past ocular history was notable for uncomplicated cataract surgery in both eyes. She had been treated with sub-Tenon's triamcinolone without resolution of symptoms. Past medical history was notable for breast cancer treated with mastectomy, hypertension, and depression. Anterior segment exam was unremarkable. Dilated fundus exam was notable for 2+ vitreous cells in both eyes, but the retina was otherwise unremarkable.

MRI of the brain and lumbar puncture were unremarkable. After diagnostic vitrectomy of the left eye to evaluate for primary vitreoretinal lymphoma (PVRL), the cytology showed atypical appearing lymphocytes. Polymerase chain reaction (PCR) did not indicate presence of a clonal population, and the sample was not sufficiently cellular for flow cytometry. Gram stain and cultures did not show evidence of an infectious process.

Due to the equivocal results, diagnostic pars plana vitrectomy (PPV) was performed in the right eye, which also showed atypical appearing lymphocytes, though the PCR and flow cytometry results did not indicate the presence of lymphoma. The microbiology workup was negative. The patient's floaters resolved after surgery, and she was observed with serial exams and MRIs every 6 months.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After being lost to follow-up for 2.5 years, she then presented with deterioration of vision to hand motions in the left eye. She was noted to have a white plaque behind her intraocular lens (IOL) in the left eye, which hindered our view of the fundus. B-scan ultrasonography did not show a mass or retinal detachment. The patient underwent repeat PPV of the left eye to excise the

plaque for further analysis. Phakic IOL and infectious etiologies such as endogenous fungal endophthalmitis were considered.

In the video (*available at www.healio.com/OSLIRetina*), three 25-gauge ports were placed, and a 6-mm infusion cannula was confirmed to be in the vitreous cavity by pressing it against the posterior lens capsule. With air infusing the vitreous cavity, the plaque was easily aspirated with the vitrector to obtain a non-dilute sample for pathology. Behind the plaque, there was no evidence of lymphoma in the vitreous cavity or retina. The pathologic specimen confirmed the diagnosis of large B-cell lymphoma. MRI of the brain now revealed enhancing lesions within the cerebellum, consistent with primary central nervous system lymphoma (PCNSL).

PVRL is commonly associated with PCNSL, and both are most often of B-cell origin.[1] Although 15% to 25% of patients with PCNSL develop ophthalmic manifestations of lymphoma, 56% to 90% of patients with PVRL have or will develop CNS manifestations.[2] PVRL can be a diagnostic challenge, as it is a "masquerade syndrome," which is responsive to corticosteroids just like noninfectious uveitis. Posterior uveitis is the most common sign and presents frequently with increased floaters and blurred vision, as in this case.[2] Patients may also present with cream-colored retinal or retinal pigment epithelium infiltrates, with a leopard-skin appearance on fluorescein angiography.[3] As far as we are aware, this case represents the first report of PVRL manifesting as a plaque on the posterior capsule of an IOL.

Specimens for histologic evaluation can be obtained by either fine-needle vitreous aspiration or vitrectomy. As in this case, multiple biopsies may be necessary to obtain a definitive pathological diagnosis. Specimens should be carefully processed to prevent cell degeneration that makes diagnosis difficult. Obtaining only a sparse number of cells is the most common reason for a negative vitrectomy specimen, though vitreous specimens may also contain reactive T-cell lymphocytes, necrotic cells, fibrin, and inflammatory debris that can confound identification of malignant cells.[4] Retinal or chorioretinal biopsies may be necessary in certain cases. Other useful diagnostic tools include vitreous cytokine analysis showing IL-10:IL-6 ratio greater than 1.0, flow cytometry to examine cell surface markers and demonstrate a monoclonal B-cell population, and PCR to amplify the immunoglobulin heavy chain DNA and detect gene rearrangements.[5]

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