ONE PROCEDURE, TWO USES

A brief examination of the role of vitrectomy in diagnosing and treating uveitis.

BY THOMAS ALBINI, MD

Shortly after the development of the pars plana vitrectomy (PPV) technique by Robert Machemer, MD, in 1970, its use for the diagnosis and treatment of both infectious and neoplastic conditions was explored. In 1975, Michels et al first reported the diagnosis of reticulum cell sarcoma (ie, intraocular lymphoma) using the PPV technique. Within 6 years, the first report on use of PPV for the control and treatment of noninfectious uveitis was published.2

As PPV has become more efficient, effective, and safe, due largely to advances in fluidics and operative viewing, with smaller instrumentation, valved trocars, and widefield viewing, it has been successfully used to diagnose posterior segment uveitis and conditions masquerading as uveitis.

DIAGNOSING WITH PPV

Lymphoma or Uveitis?

Most patients with intraocular lymphoma will present with posterior or panuveitis3; thus, it is important to be familiar with disease characteristics and to have a suspicion in appropriate cases. The gold standard for the diagnosis of lymphoma remains cytology (Figures 1 and 2). A nondilute specimen is obtained immediately upon commencing PPV using small-gauge instrumentation, with the infusion either turned off or turned to air to obtain the highest cellular concentration possible.4,5

Multimodal imaging, appropriate clinical suspicion, brain imaging, and careful detailed planning of specimen handling with the ocular pathologist or pathologist is paramount. Recent evidence supports using low cut rates (500 to 1,000 cpm) to optimize cellular integrity.6 The sensitivity of cytology remains low despite improvements in techniques, and ancillary analysis such as flow cytometry, interleukin 10:6 ratio, gene rearrangement studies, and MYD88 testing can help guide patient management even in the absence of definitive cytologic diagnosis.7

Serial brain MRI every 6 to 12 months may help make an earlier diagnosis of central nervous system lymphoma. In many cases, the vitreous may not provide a definitive diagnosis, but biopsy of subretinal infiltrates may be diagnostic. This can often be accomplished by making a small retinotomy adjacent to the infiltrate with intraocular diathermy and then using a soft tip cannula to move the retinotomy over the infiltrate and aspirate the infiltrate into a syringe. In rare cases, chorioretinal biopsy may be necessary to make a definitive diagnosis.8

Is it Infectious?

Diagnostic testing for infectious uveitis is essential. PPV is often used to obtain specimens for culturing in patients with postsurgical endophthalmitis with hand motions or worse VA, chronic postoperative endophthalmitis, or suspected endogenous endophthalmitis. Careful handling of specimens for culture in the microbiology laboratory is important. Polymerase chain reaction can be helpful for rapid identification of bacterial, fungal, and mycobacterial pathogens. Polymerase chain reaction is essential in identifying viral pathogens, toxoplasmosis, and tuberculosis. Intraoperative antibiotics can be given if appropriate pathogens are suspected. If a concurrent retinal detachment is present, silicone oil may be used to maintain postoperative visibility of the fundus, and this may add some antimicrobial properties.

Surgeons can safely employ 27-gauge surgery in many of these cases,9 and it does not appear that cut rates or dilution of sample with fluid infusion have an impact on diagnostic yield.

AT A GLANCE

► PPV can be used to diagnose and treat posterior segment uveitis and conditions that mimic uveitis.

► PPV can also be used to treat complications of uveitis, such as rhegmatogenous or tractional retinal detachment, epiretinal membrane, macular hole, cystoid macular edema, and vitreous opacity.

► PPV has been thought to itself play a role in controlling ocular inflammation, but due to a lack of evidence it is best used as a last resort for this purpose.
TREATING WITH PPV

PPV has been used to treat many complications of uveitis, such as rhegmatogenous or tractional retinal detachment, epiretinal membrane, macular hole, cystoid macular edema, and vitreous opacity (Figure 3). In all of these settings, perioperative control of inflammation is paramount; however, no comparative data are available to guide choices for perioperative control.

Antibiotics are safe for most patients with uveitis from infectious causes, such as in toxoplasmosis or acute retinal necrosis. Perioperative steroids can be given orally, injected in the sub-Tenon space, or topically applied, and choice of agent and dose can be tailored to the risk of recurrent uveitis. For example, for an otherwise healthy patient with difficult-to-control intermediate uveitis undergoing 2 years of methotrexate therapy and epiretinal membrane peel, I would likely recommend adding 30 mg of prednisone daily to the methotrexate starting 1 week before surgery and continuing for 2 weeks after surgery with a rapid taper, in addition to the use of a topical steroid. On the other hand, for a diabetic patient with anterior uveitis that has been quiet for 3 years without the use of medications, I would recommend using topical difluprednate (Durezol, Novartis) four times daily for a few weeks after surgery followed by taper.

Serial examination for cystoid macular edema, retinal vasculitis, anterior chamber or vitreous cell and/or new chorioretinal lesions in selected patients is essential in the postoperative period. Outcome data on the visual benefit of using PPV to treat the complications of uveitis are largely lacking. However, modern vitrectomy techniques, combined with appropriate inflammatory control and careful monitoring, can lead to good surgical results in patients treated for complications of uveitis by standard surgical techniques.

Because it removes immunocompetent cells and cytokines from the vitreous cavity, PPV has long been thought to

Figure 1. An 80-year-old Hispanic man with known central nervous system lymphoma and vision loss in his left eye over the past 2 years had vitritis and multiple subretinal lesions, which were observed with fundus photo (A). The lesions often coalesced and were atrophic in spots. Subretinal infiltrates could be seen on OCT (B). Vitreous biopsy diagnosed vitreoretinal lymphoma.

Figure 2. Multiple white epiretinal nodules and vascular leakage (A) are seen in the eye of a 68-year-old woman with vitritis 1 month after uncomplicated macular hole repair. OCT shows multiple small nodules on the retinal surface (B). Aspiration of these small infiltrates was cultured and grew Mycobacterium fortuitum.
UVEITIS

Although some data are supportive of this therapeutic role,13 the preponderance of the data are inconclusive. Therefore, due to lack of a definitively demonstrated benefit, the use of PPV itself as a means of controlling intraocular inflammation should remain a last resort. ■


THOMAS ALBINI, MD
■ Professor, Clinical Ophthalmology, Bascom Palmer Eye Institute, University of Miami, Florida
■ talbini@med.miami.edu
■ Financial disclosure: None acknowledged