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Surgical Outcomes of Epiretinal Membranes in Patients with a History of Well-Controlled Preoperative Uveitis

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Purpose: To determine surgical outcomes in patients with uveitis who underwent surgery for epiretinal membrane.

Design: Multicenter, interventional, retrospective, consecutive case series.

Subjects: Patients with a history of controlled uveitis and concurrent visually significant epiretinal membrane.

Methods: All eyes underwent 23-gauge pars plana vitrectomy with membrane and internal limiting membrane peeling between 2011 and 2015. Demographic data, visual acuity, slit lamp and fundoscopic examination, and optical coherence tomography were reviewed preoperatively and postoperatively.

Main Outcome Measures: Visual acuity, mean central foveal thickness, macular cube volume, and uveitic activity preoperatively and postoperatively at 1, 3, and 6 months.

Results: Fifteen patients (17 eyes) were included. The mean follow-up duration was 23.2 months. Seventeen eyes (88.2%) received intravenous methylprednisolone and 10 eyes (58.8%) received intraocular steroids at the time of surgery. There was a significant improvement in mean central foveal thickness (517 vs. 371 microns; $P = 0.01$) and macular cube volume (12.1 vs. 9.4 mm^3; $P = 0.01$) 6 months postoperatively. There were no epiretinal membrane recurrences. There was a trend toward improved mean postoperative visual acuity at 6 months (0.8 [±0.6] vs. 0.6 [±0.6] logarithm of the minimum angle of resolution units; $P = 0.36$). All eyes were inactive at the final visit, but 5 eyes (29.4%) required further immunomodulatory therapy postoperatively. One eye developed increased intraocular pressure that required topical therapy.

Conclusion: Eyes with a history of controlled uveitis have low surgical recurrence rates that are comparable with those without uveitis. Most patients do not require escalation of immunomodulatory therapy after surgery. *Ophthalmology Retina 2017;■:1–5 © 2017 by the American Academy of Ophthalmology*

Epiretinal membranes (ERM) in patients with a history of uveitis are common, with an estimated prevalence of 18% to 48% in ≥1 eye.[1–3] Risk factors include older age, male sex, history of cataract surgery, prior vitrectomy, laser, or intraocular injection.[3] It is caused by fibrocellular proliferation and migration of glial cells along the internal limiting membrane (ILM).[4] Unlike idiopathic ERM, however, uveitic ERM may be uniquely classified based on the presence of inflammatory cells and a lack of retinal pigment epithelial cells in the microstructural components.[5,6]

Although some studies suggest minimal impact of uveitic ERM on vision,[7] the clinical implications on visual function and treatment may vary based on the location and extent of ERM contraction,[8] retinal thickness or distortion,[5,8,9] or concurrent macular edema.[9] As a result, few studies have described surgical treatment of visually significant uveitic ERM with pars plana vitrectomy (PPV) in specific uveitic diseases.[10–12] Most recently, Tanawade et al[13] and Pion et al[14] published 2 series of patients with a history of any uveitis (active and inactive) who underwent PPV for an ERM, with varied surgical techniques within their individual cohorts. However, limited data are available on surgical outcomes in uveitic patients with good preoperative inflammatory control, irrespective of uveitic type (infectious or noninfectious) and long-term uveitic control.

The purpose of this multicenter, retrospective case series was to analyze the surgical, perioperative visual, anatomic, and inflammatory outcomes of patients with a visually significant ERM and history of any uveitis who underwent PPV with membrane and ILM peeling in the setting of inactive preoperative inflammation.

Methods

This was a multicentered retrospective review of patients evaluated between 2011 to 2015 at the Associated Retinal Consultants (Royal Oak, MI), and the Massachusetts Eye and Ear Infirmary (Boston, MA). Inclusion criteria included eyes with a history of any type of uveitis, having undergone a pars plana vitrectomy for an ERM, and having had inactive uveitis for at least 3 months prior to surgery. Exclusion criteria included lack of OCT, absence of an ERM or history of uveitis (infectious or noninfectious), active uveitis at the

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time of surgery, concurrent full-thickness macular hole, or macula-involving retinal detachment. Institutional review board approval for the data collection and study was granted by the Beaumont and Massachusetts Eye and Ear Infirmary Institutional Review Boards. The study complied with the Health Insurance Portability and Accountability Act, and research adhered to the tenets of the Declaration of Helsinki.

Preoperative characteristics were obtained during the visit before surgery, including age, sex, race, eye, lens status, concurrent ocular and systemic diseases, and Snellen visual acuity. Uveitis diagnosis, baseline topical and systemic immunosuppressive therapy, and the use of preoperative pulsed oral steroids were also recorded. The presence of an ERM was determined based on spectral domain OCT (Heidelberg Engineering, Carlsbad, CA, and Cirrus, Carl Zeiss Meditec, Dublin, CA) that was obtained at the visit before surgery. Each eye was imaged with the same modality of OCT at each time period for consistent comparison. Preoperatively, ERM was defined as a hyperreflective preretinal layer on OCT and later confirmed intraoperatively with negative staining using ICG in all patients. Intraoperative use of intravitreal triamcinolone and complications were also recorded. Uveitis diagnosis was determined based on the Standardization Uveitis Nomenclature Working Group Guidelines.[15] Well-controlled preoperative uveitis was defined as inactive with or without topical or systemic immunosuppressive treatment based on SUN criteria for at least 3 months.

Statistical analysis was performed using STATA software (version 13.1; StataCorp, College Station, TX). Best-corrected logarithm of the minimum angle of resolution visual acuities (VAs), macular cubic volume, and mean central foveal thickness before surgery were compared with 1-, 3-, and 6-month postoperative measurements with the Wilcoxon signed-rank test.

Results

Initially, 164 patients were identified based on specific billing codes (67041 and 67042) between 2013 and 2015. We excluded 148 patients because they had no uveitis before surgery (n = 134), no concurrent ERM (n = 4), no ILM peel during surgery (n = 5), missing OCT data (n = 3), and either a concurrent full-thickness macular hole or macula-involving retinal detachment (n = 2).

Fifteen patients (17 eyes) were ultimately included. Baseline ocular characteristics are listed in Table 1. Average duration of follow-up from surgery to final visit was 23.2 months (range, 4.5–54.2 months). Of the 17 eyes, uveitis diagnoses included anterior uveitis with positive QuantiFERON-TB Gold (n = 2), uveitis–glaucoma–hyphema syndrome (n = 1), toxoplasmosis panuveitis (n = 1), acute retinal necrosis (n = 1), presumed ocular histoplasmosis syndrome (n = 1), treated infectious endophthalmitis (n = 1), panuveitis or posterior uveitis associated with rheumatoid arthritis (n = 3), and idiopathic anterior (n = 1), posterior (n = 4), or panuveitis (n = 2)(Table 2). Of note, one patient tested positive for QuantiFERON-TB Gold (n = 2 eyes). This patient refused systemic treatment, although suspicion for active tuberculosis was deemed to be low by referring infectious disease physicians. Preoperatively, 15 of 17 eyes (88.2%) exhibited macular edema (thickening and/or intraretinal cysts) based on OCT and examination with a mean central foveal thickness of 517 microns (±194).

Nine eyes (52.9%) were receiving baseline ocular steroid therapy (n = 8, topical prednisolone acetate 1%; n = 1, intravitreal dexamethasone, 0.7 mg), and 4 eyes (23.5%) were receiving systemic immunosuppressive therapy (Table 2). Fifteen eyes (88%) received preoperative pulsed steroids before surgery (60 mg 3 days before surgery, with a 10-mg taper each week after surgery).

Table 1. Baseline Characteristics of Eyes with a History of Uveitis and Concurrent Epiretinal Membrane

Variable	Total
Participants (n)	17
Age at first visit, mean yrs (range)	64.7 (21–90)
Sex, n (%)	
Male	9 (52.9)
Female	8 (47.1)
Concurrent eye disease (n)	8
Non-neovascular age-related macular degeneration, n (%)	2 (25)
Nonproliferative diabetic retinopathy, n (%)	1 (12.5)
Coats' disease, n (%)	1 (12.5)
Prior vitrectomy for retinal detachment or concurrent macular-sparing retinal detachment, n (%)	3 (37.5)
Secondary glaucoma, n (%)	1 (12.5)
Eye, n (%)	
Right	7 (41.1)
Left	10 (58.8)
Phakic status, n (%)	
Phakic	4 (23.5)
Pseudophakic	13 (76.5)
Total follow-up, mean months (range)	23.2 (4.5–54.2)

All 17 eyes underwent 23-gauge, 3-port PPV with membrane and ILM peeling (Fig 1). A core vitrectomy was initially performed, followed by ICG staining to identify the ERM (negative stain) and ILM (positive stain). At the time of surgery, 10 eyes (58.8%) received intravitreal steroids (n = 9 triamcinolone, 4 mg/mL; n = 1 fluocinolone intravitreal implant, 0.7 mg). Two eyes developed concurrent retinal tears during surgery and were treated intraoperatively. None of the patients developed retinal detachment intraoperatively or postoperatively.

Thirteen eyes (76.5%) had no anterior or posterior inflammation 1 month after surgery. Five eyes (29.4%) required an escalation of immunosuppressive therapy owing to recurrent inflammation during the postoperative period. However, all eyes had inactive uveitis at the end of the follow-up period with escalated therapy based on SUN criteria. Five eyes (29.4%) also developed cystoid macular edema, defined as macular thickening or cysts noted on examination and/or OCT, that required treatment. One patient (5.9%) developed elevated intraocular pressure postoperatively, which was controlled with topical antiglaucoma therapy only. Of note, 1 eye had a tube shunt in place before the PPV (Table 2). Two eyes (50%) underwent cataract extraction after PPV (data not shown). No eyes developed a recurrent ERM during the follow-up period (Table 2).

At 6 months, the mean central foveal thickness statistically improved compared with preoperative measurements (370.5 ±SD 116.6 vs. 517.1 μm ±SD 194.1, respectively; $P = 0.01$). Similarly, the mean macular cubic volume statistically improved at 6 months compared with preoperative mean macular cubic volume (9.4 ±SD 1.1 vs. 12.1 mm^3 ±SD 3.4, respectively; $P = 0.01$). There was a trend toward improved postoperative best-corrected VA at month 6 (0.6 vs. 0.7 logarithm of the minimum angle of resolution units, respectively; $P = 0.36$; Table 3). Of the 16 eyes with available visual acuity at 6 months, 8 eyes (50%) improved by at least 1 line in Snellen VA, 2 (12.5%) had no change, and 6 eyes worsened by 1 line (37.5%) after surgery. At 1 year, 8 out of 15 eyes (53.5%) improved by 1 Snellen VA line, 3 (20%) had no change, and 4 eyes (26.7%) worsened by 1 line. Of note, we did not objectively measure metamorphopsia or contrast sensitivity as outcomes.