

TRANSVITREAL FIBRINOID REACTION: A RARE COMPLICATION

Be prepared to handle this adverse event following vitrectomy in patients with diabetic retinopathy.

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Pars plana vitrectomy (PPV) is often indicated to improve the vision of patients with proliferative diabetic retinopathy (PDR) complicated by diagnoses such as non-clearing

vitreous hemorrhage or tractional retinal detachment (TRD).¹ One rare and early postoperative complication in this setting is the formation of transvitreal webs of fibrin, which requires prompt management to prevent subsequent complications, such as TRD.²⁻⁵ Here, we present a characteristic example of a fibrinoid reaction following PPV in a patient with diabetes who achieved resolution over the course of 2 weeks with topical steroids.

CASE PRESENTATION

A 57-year-old man with type 2 diabetes complicated by diabetic foot infection, resulting in below-the-knee amputation, and PDR in each eye presented to the retina clinic for surgical evaluation. His VA was counting fingers OD and no light perception OS. IOP was 15 mm Hg OD and 70 mm Hg OS. Anterior segment examination showed no active neovascularization of the iris in either eye. Posterior segment examination of the right eye showed neovascularization of the disc, with fibrotic membranes emanating from the nerve superiorly and inferiorly alongside vitreomacular traction causing macular edema. OCT of the macula showed tractional membranes and vitreomacular traction with severe cystoid macular edema (CME) and subretinal fluid with an impending macular hole (Figure 1). The left eye was noted to have neovascular glaucoma with absolute cupping of the optic nerve.

The patient underwent preoperative intravitreal bevacizumab (Avastin, Genentech/Roche) injection in the

right eye followed by PPV with membrane peel, endolaser (360° panretinal photocoagulation), fluid-air exchange, and intraoperative intravitreal bevacizumab. On postoperative day 1, the patient was noted to have a 60% to 70% air fill, with some mild intravitreal membranes below the level of the air bubble without significant anterior chamber reaction. He was started on 1% prednisolone acetate and 0.3% ciprofloxacin drops four times daily and 1% atropine twice daily.

One week later, his posterior segment examination was notable for a 30% air fill with significantly increased inferior membranes, consistent with a fibrinoid reaction (Figure 2). Again, there was no significant anterior chamber reaction or conjunctival injection, and the patient denied any pain. Topical 1% prednisolone acetate was increased to every 2 hours while awake. The patient was also maintained on 1% atropine twice daily, and ciprofloxacin was discontinued.

At postoperative week 2, the inferior vitreous webs had

AT A GLANCE

- ▶ The formation of transvitreal webs of fibrin is a rare postoperative complication after vitrectomy for proliferative diabetic retinopathy.
- ▶ Although the cause of transvitreal fibrinoid reaction is not always clear, clinicians must always rule out endophthalmitis.
- ▶ The fibrinoid reaction often resolves rapidly with topical steroids alone, although other management options exist for refractory cases.

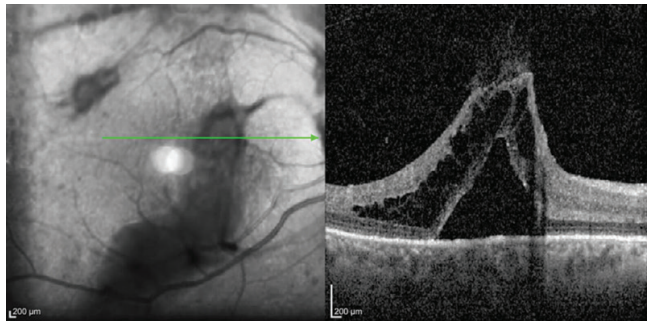
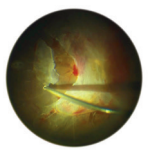


Figure 1. The patient's OCT revealed fibrotic membranes and vitreomacular traction causing CME with subretinal fluid.

improved but were not fully resolved (Figure 3). The same treatment was maintained with resolution of the fibrinoid reaction 1 week later, at which point the prednisolone acetate was tapered to four times daily.

The patient also had relieved macular traction and an improvement in subretinal fluid. The patient will be considered for intravitreal bevacizumab or a dexamethasone implant (Ozurdex, Abbvie) at future visits, depending on the persistence of subretinal fluid.

UNDERSTANDING THE COMPLICATION

In a 1982 retrospective review of 280 diabetic vitrectomies,⁵ 15 eyes developed strands of fibrin on the surface of the retina and behind the iris between postoperative days 2 and 14. This was followed 1 to 2 days later by a “gelatinous mass” in the vitreous that resulted in TRD and neovascular glaucoma. This clinical course was reversed by systemic and topical corticosteroids in only six of 15 eyes. Additionally, the complication was found to occur more commonly with concurrent lens surgery or scleral buckling, and it was proposed that these combined surgeries may result in increased vascular permeability with resultant fibrin deposition.⁵

More recently, Luo et al described a series of eight eyes of seven patients, all of whom underwent PPV with endolaser and fluid-air exchange.³ All patients exhibited the fibrinoid bands on postoperative day 1.³ While one patient was given oral moxifloxacin due to slow resolution of fibrin, all other patients achieved resolution of the fibrinoid reaction on standard postoperative drops (atropine, antibiotic, and prednisolone acetate from four times daily to every 2 to 3 hours). Mean time to resolution of fibrin was 8.75 days.³

Nelson et al described a case of submacular fibrinoid material noted on postoperative day 4 after cataract extraction with IOL insertion, PPV, endolaser, partial fluid-air exchange, intravitreal bevacizumab, and sub-Tenon triamcinolone acetate.⁴ This resolved in 2 weeks following repeat treatment with sub-Tenon triamcinolone. The patient's other eye underwent a similar surgery without sub-Tenon triamcinolone and subsequently developed transvitreal and submacular fibrinoid material

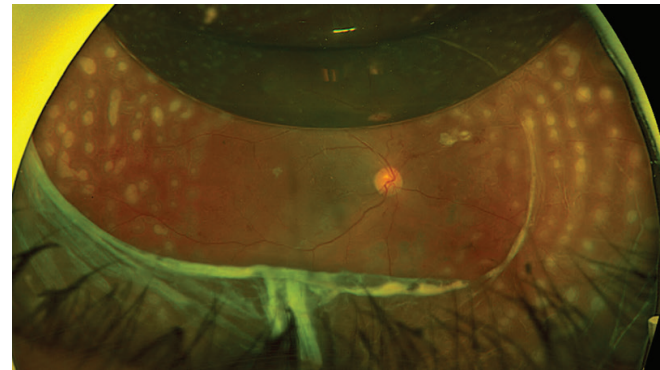


Figure 2. One week postoperatively, the patient presented with inferior vitreous membranes consistent with a fibrinoid reaction.

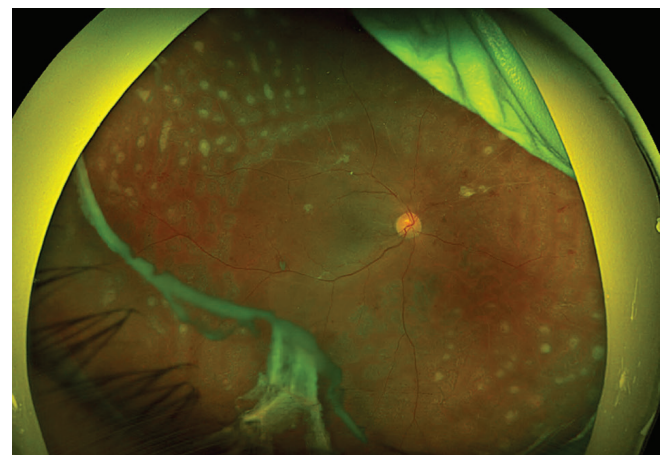


Figure 3. At postoperative week 2, the patient showed improvement but not resolution of the fibrinoid reaction after treatment with 1% prednisolone acetate every 2 hours.

on postoperative day 4, which again achieved near resolution 2 weeks following sub-Tenon triamcinolone.⁴

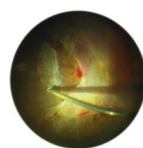
Sinha et al described a case of dense transvitreal bands appearing on postoperative day 1 after PPV with endolaser that improved with systemic and topical steroids; however, the patient experienced worsening vision due to progressive traction requiring reoperation.²

Of note, because the cause of a transvitreal fibrinoid reaction is not always clear, clinicians must always rule out endophthalmitis. Unlike endophthalmitis, the postoperative sterile fibrinoid reaction has minimal or no pain, anterior chamber reaction, vitreous cell, and conjunctival injection, and the retina is typically visible through the bands.^{2,3,6}

Even once endophthalmitis is ruled out, the differential diagnosis could include sterile intraocular inflammation resulting from the use of intraocular agents, such as triamcinolone acetonide and bevacizumab.⁶

Several contributory mechanisms for the fibrinoid reaction observed after PPV in diabetic patients have been posited.⁵ The diabetic vitreous has some inherently proinflammatory characteristics, which may be exacerbated by operative interventions, such as PPV and endolaser.^{2,3}

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Endolaser may also compromise the blood-retina barrier, particularly in patients with diabetes who already have preexisting vasculopathy.²⁻⁴ Furthermore, the use of air may result in the fluid-air meniscus serving as an inflammatory interface for the deposition of fibrin.³

However, the inflammatory nature of the fibrinoid reaction is somewhat challenged by accounts of fibrinoid reactions occurring despite the use of intraoperative corticosteroids.^{3,4} Additionally, it is unclear why the fibrin would be confined to the posterior segment and have minimal anterior chamber reaction or vitreous cell.³ Other theories include the idea that the fibrinoid response may represent a posterior segment equivalent of toxic anterior segment syndrome, resulting from a particular substance, possibly a contaminant, triggering a brisk immunologic response.^{2,3,6}

While corticosteroids are generally considered the mainstay of treatment, tissue plasminogen activator has also been used to rapidly and successfully resolve post-PPV fibrin in both the anterior chamber and vitreous cavity.⁷

BE ON THE LOOKOUT

The rare complication of transvitreal fibrinoid reaction following PPV in diabetic eyes may be more common in the setting of concurrent endolaser, fluid-air exchange, and other combined procedures such as cataract extraction. The fibrinoid reaction often resolves rapidly with topical steroids alone, although other management options exist for refractory cases. Clinicians should be aware of this rare entity to avoid confusion with endophthalmitis and to guide proper management. ■

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