

# The Surgical Management of Uveitic Glaucoma

Advice on diagnosis and treatment.

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## CASE PRESENTATION

A 48-year-old black male was referred with a 1-month history of cloudy vision, photophobia, and periorbital pain in his right eye. An outside ophthalmologist had made the diagnosis of ocular hypertension and uveitis in the patient's right eye and initiated treatment with a timolol-dorzolamide combination b.i.d., brimonidine-P 0.15% t.i.d., bimatoprost q.h.s., acetazolamide 500 mg p.o. b.i.d., and prednisolone acetate 1% q2h.

The patient's IOP on presentation was 40 mm Hg OD. There was low-grade nongranulomatous uveitis, mild corneal edema, and a circumciliary flush but no keratic precipitates or iris nodules (Figure 1). The angles were open (grade 4). There was no posterior uveitis or retinitis, and the optic nerve had mild thinning of the inferotemporal

rim (Figure 2). The patient's left eye appeared to be within normal limits (Figure 1).

## Comments on the Differential Diagnosis

**KB:** The differential diagnoses include inflammatory glaucoma and steroid-induced glaucoma. The degree of angle pigmentation can give some indication as to the cause of the elevated IOP. Occasionally, a patient is referred to me with pigmentary glaucoma that has been misdiagnosed as uveitic glaucoma. Eyes with uveitis can certainly have increased pigmentation of the angle, probably caused by a loss of pigment from the iris. The pigmentation of the angle in uveitic eyes is usually not as heavy as it is in pigment dispersion syndrome, and increased pigment may only be present in the inferior angle.

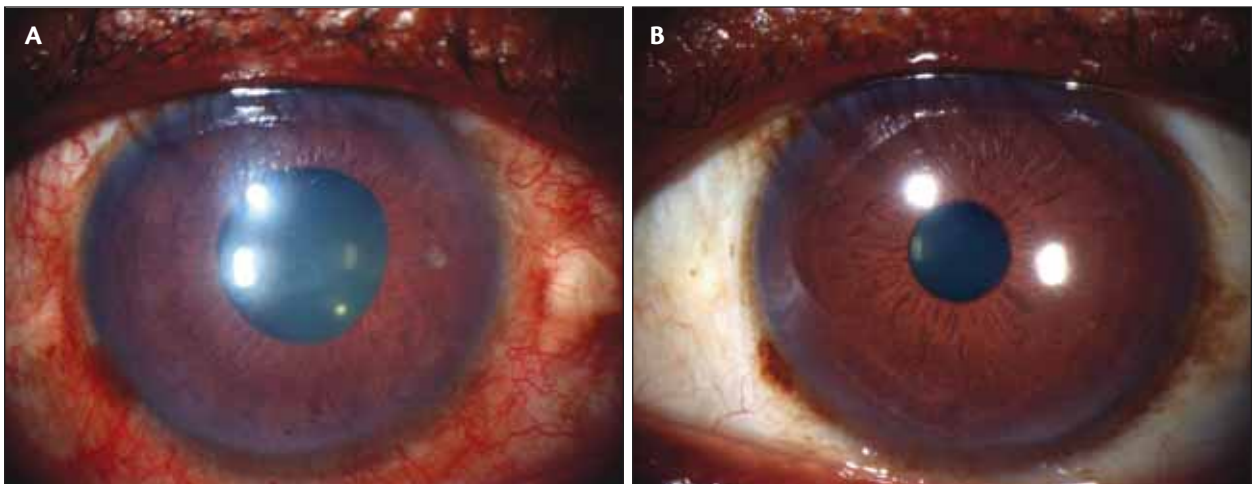


Figure 1. The slit-lamp examination revealed diffuse conjunctival injection with mild corneal edema of the patient's right eye without keratic precipitates or iris nodules (A). His left eye was normal (B).

The topical prednisolone acetate was tapered, and the IOP decreased to 11 mm Hg. One week after the medication was stopped, however, the anterior chamber inflammation recurred, and the IOP rose to 39 mm Hg. Prednisolone acetate was therefore restarted, and topical flurbiprofen was added to the drug regimen.

*Comments on the Benefit of Nonsteroidal Anti-Inflammatory Drugs (NSAIDs) in Treating Inflammatory Glaucoma*

**KB:** NSAIDs can assist in the control of anterior uveitis, but they are less effective than steroids. Care must also be taken, as there is some evidence that NSAIDs may reduce alpha agonist- and prostaglandin-mediated IOP lowering.<sup>1-3</sup> For short-term treatments, I tend to use systemic NSAIDs more than topical formulations. For longer-term treatments, I prescribe topical formulations to reduce the gastrointestinal side effects. An alternative approach would be to use 1% rimexolone (Vexol; Alcon Laboratories, Inc., Fort Worth, TX), but this agent may only be appropriate for treating low-grade inflammation. Unfortunately, one cannot pharmacologically separate the anti-inflammatory effect of corticosteroids from their IOP-elevating effect.

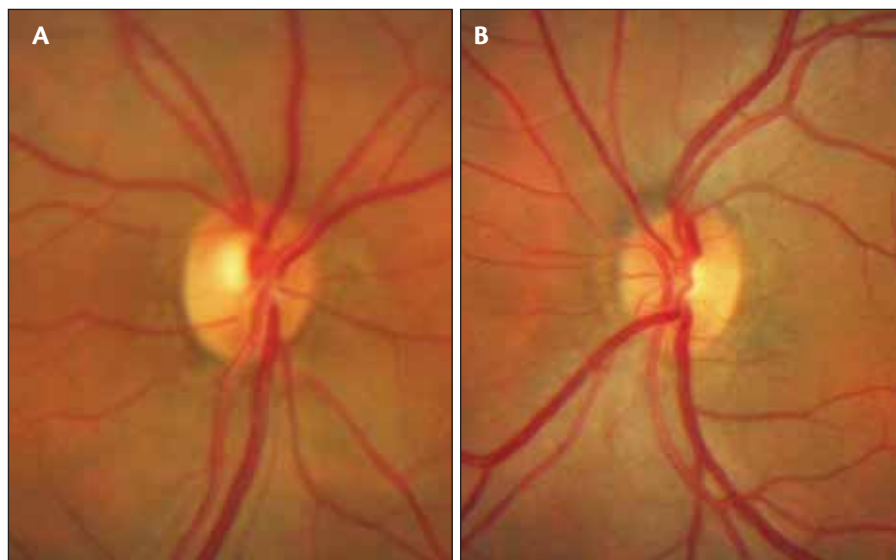
Diffuse peripheral anterior synechiae developed over the next few months, despite intensive steroid treatment. The IOP in the patient's right eye remained elevated at around 30 mm Hg. Repeat optic nerve examination revealed progressive thinning of the neuroretinal rim inferotemporally compared with the initial presentation. The surgical lowering of IOP was recommended.

*Comments on Trabeculectomy Versus Glaucoma Drainage Devices in Patients With Uveitis*

**KB:** I try to control the inflammation when possible prior to surgery. In patients with significant inflammation, I use systemic steroids.

**JGC:** In whom do you use systemic steroids, and what doses do you prescribe?

**KB:** I prescribe these drugs for patients with panuveitis or in cases in which there have been other forms of posterior uveitis or cystoid macular edema. In addition, I



**Figure 2.** The optic nerve of the patient's right eye had mild thinning of the inferotemporal rim (A). The optic nerve of his left eye was normal (B).

consider systemic steroids for patients with aggressive or recurrent anterior uveitis such as that associated with HLA-B27. Patients will typically take 40 mg of prednisone for 3 to 14 days before surgery and taper by 5 mg per day per week postoperatively.

**RNW:** What are your views regarding a glaucoma drainage device versus trabeculectomy?

**KB:** Glaucoma drainage devices probably work better in uveitic glaucoma than in almost any other type of secondary glaucoma. In my experience, however, a trabeculectomy with mitomycin C (MMC) achieves pressure control (less than 21 mm Hg off medications) in approximately 70% of eyes with uveitic glaucoma. In this series,<sup>4</sup> my coworkers and I used a relatively low concentration of MMC (0.2 mg/mL for 3 minutes) and active postoperative management, including the removal of releasable sutures, bleb massage and needling, or 5-fluorouracil (5-FU) injections when necessary.

My long-term aim is to create a risk profile of uveitic glaucoma to identify in advance those patients who will require the implantation of an aqueous shunt as the primary surgical treatment and those in whom trabeculectomy will be sufficient. In patients with juvenile rheumatoid arthritis and in those who are aphakic, I usually perform primary aqueous-shunt implantation, because the success rate of trabeculectomy is so poor.

*Comments on the Use of an Antimetabolite*

**KB:** My coworkers and I completed a small study comparing 5-FU and MMC intraoperatively in uveitic glaucoma.<sup>5</sup> After 3 years of follow-up, the success rate was sig-

nificantly higher in the MMC group. When we followed these patients for a longer period, up to 7 years, however, there was no significant difference in bleb survival. In the longer term, there is probably not much difference in IOP control. The eyes receiving 5-FU failed earlier, however, than those with MMC.

**“Intraocular inflammation and steroids can both lead to elevated IOP, and systemic and topical NSAIDs may have limited benefit as adjunctive therapy for uveitis.”**

My rationale for using 0.2 mg/mL of MMC as opposed to the more traditional 0.4 to 0.5 mg/mL (3-minute period) was simply to minimize the early hypotony that I was observing when the higher concentration was applied for 3 minutes. In my experience with higher dosages of MMC in a uveitic eye, low postoperative pressure cannot be prevented, even with the tight suturing of the scleral flap. My belief is that the higher dosages of MMC affect the ciliary body to some degree. There is probably less aqueous production, so the early bleb formation that is required for longer-term success does not occur. Although MMC prevents healing, allowing tight scleral closure and later drainage, I think some aqueous drainage is required in the first postoperative week to establish a bleb.

**RNW:** What exposure time do you use?

**KB:** The concentrations I mentioned earlier should be taken in the context of the exposure time. Clearly, higher concentrations used for less than 3 minutes will have a similar effect. I apply MMC for 3 minutes based on work by Wilkins<sup>6</sup> on pig eyes. Maximum scleral uptake occurs in approximately 3 minutes, so there is no logic in a longer application, because the extra MMC will simply percolate into the eye.

**JGC:** High-performance liquid chromatography has detected MMC in the deepest layers of the sclera<sup>7</sup> and ciliary body.<sup>8</sup> Furthermore, there is histological evidence that the transscleral application of MMC induced histological changes in the rabbit ciliary body.<sup>9</sup> It is therefore possible that MMC may further reduce aqueous flow in uveitic eyes, thereby predisposing them to low postoperative IOP.

**KB:** Surgical technique plays a major role in avoiding postoperative hypotony, but my experience has convinced me that an exposure to higher doses of MMC causes hypotony over and above that achieved by over-filtration in some patients.

## CONCLUSION

Managing uveitic glaucoma can be challenging. Intraocular inflammation and steroids can both lead to elevated IOP, and systemic and topical NSAIDs may have limited benefit as adjunctive therapy for uveitis. When surgical intervention is indicated, trabeculectomy with MMC can provide effective long-term IOP control. Lower concentrations of the agent may help reduce the incidence of postoperative hypotony in these patients. Primary glaucoma drainage devices may be preferable in cases of juvenile rheumatoid arthritis. □

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