CASE PRESENTATION

A 40-year-old man was referred for unilateral glaucoma in his left eye. Medical history was unremarkable for systemic disorders and medications. The patient had undergone uneventful phacoemulsification and posterior chamber intraocular lens (PCIOL) implantation in the same eye two years ago. Six months postoperatively intraocular pressure (IOP) was inadequately controlled with topical medications. The most recent examination revealed best-corrected visual acuity of 10/10 with plano -0.5x100° and plano -1.75x60° in the right and left eyes, respectively. Slitlamp examination was unremarkable in the right eye. Examination in the left eye disclosed a normal tear film, intact and mobile conjunctiva, fine diffuse keratic precipitates (KPs), trace cells but no flare in the anterior chamber, diffuse iris atrophy with no synechiae, a well-positioned PCIOL, mild fibrotic posterior capsule opacification, and trace cells in the anterior vitreous. IOP was 13 mmHg in the right eye with no medications and 27 mmHg in the left eye with timolol BID, dorzolamide BID and brimonidine TID. Gonioscopy revealed wide open angles with no synechiae in both eyes. Fundus examination revealed cup/disc (C/D) ratio of 0.2 with healthy appearing neural rim and macula, normal vessels and peripheral retina in the right eye; and vertical C/D ratio of 0.8 with significant neural rim loss particularly in the inferior pole, but normal appearing macula, vessels and periphery in the left eye (Fig. 1). Central corneal thickness was 579 and 559 µm in the right and left eyes, respectively. Standard achromatic perimetry was completely normal in the right eye but impaired in the left eye (Fig. 2).

Herein, we present the views of three glaucoma specialists regarding the diagnosis and management of the condition in this patient and whether adjunctive diagnostic tests or systemic evaluation is justified.
Heydar Amini, MD

Clinical findings consisting of low grade unilateral uveitis, cataract, fine diffuse KPs, iris atrophy and the absence of posterior synechiae are compatible with Fuchs heterochromic iridocyclitis (FHI). Despite diffuse iris atrophy, heterochromia has not been present; the absence of which may be due to a dark brown iris which is frequent in our patients. Differential diagnosis includes other causes of uveitic glaucoma such as herpetic keratouveitis, Posner-Schlossman syndrome, sarcoidosis and toxoplasmosis. Long-term steroid use may also cause steroid induced glaucoma. With a probable diagnosis of FHI, no additional laboratory or imaging studies are useful; the diagnosis is clinical solely based on history and examination. Recent studies, have suggested an association between FHI and the rubella virus and toxoplasmosis. Therefore, in unusual cases, laboratory tests for rubella virus or toxoplasmosis may help confirm the diagnosis. Considering treatment, laser trabeculoplasty is not effective and I would prefer trabeculectomy with adjunctive mitomycin-C. However, glaucoma drainage implants may be as effective as trabeculectomy. With both surgical approaches, chronic intraocular inflammation may ultimately lead to failure.

Kourosh Nouri-Mahdavi, MD

The patient is a 40-year old man with history of unilateral cataract surgery in his left eye and subsequent (or pre-existing) glaucoma, now unresponsive to medical treatment. There are signs of mild persistent inflammation along with diffuse iris atrophy. The first and foremost task in this case is to clarify possible issues underlying the persistent uveitis, which is the most likely cause of glaucoma. The clinical presentation, including stellate KPs, diffuse iris atrophy, lack of posterior synechiae and evidence of mild vitritis are all in favor of FHI. There are few uveitic entities that resemble FHI. Herpetic uveitis can cause iris atrophy and indolent uveitis but the iris atrophy is usually more localized, involves the full thickness of the iris and is often accompanied by signs of corneal involvement. Glaucomatocyclitic crisis can also sometimes resemble FHI. However, at least in the beginning, IOP rise is episodic and readily responds to treatment. Moreover, the KPs tend to be localized and plumper. In this particular case, the presentation does seem typical of FHI.

The main question at this point is whether we need to perform additional tests to establish the diagnosis or for therapeutic purposes. There is strong evidence that FHI is likely the final result of a viral involvement of the eye, years or decades earlier in life. Rubella virus RNA and high anti-rubella antibody titers in the anterior chamber of eyes with FHI have been recently reported. Less commonly, cytomegalovirus (CMV) has been implicated as a cause of FHI. There is no known treatment for rubella virus but the possibility of treating CMV and potentially treating the secondary glaucoma is very appealing. Therefore, if polymerase chain reaction (PCR) were readily available, I would perform an anterior chamber tap and request PCR tests for rubella, CMV, and herpes viruses. In case of a positive result for CMV or herpes, I would initiate a trial of antiviral therapy for at least a few weeks and observe the response. If PCR is not available, its results are negative or if the above-mentioned trial is inconclusive, we are left with the option of treating the secondary glaucoma since there is no known treatment for rubella virus infection.

The patient does demonstrate obvious signs of glaucoma in his left eye both at the level of the optic disc and visual field. We are unaware how high the IOP had been prior to treatment. We can only assume that it was quite higher than mid-20s since the last IOP has been 27mmHg on 3 glaucoma medications. Given the severity of glaucomatous damage, I would classify it as moderately to severely advanced. Therefore, I would require a relatively low target IOP. I think the initial target IOP could be set around mid- to upper teens considering the purely high-tension nature of the glaucoma in this case.

The patient is already on maximally tolerable medical treatment except for a prostaglandin (PG) analog. Although one would...
rather not use a PG analog in this setting, there are reports that a PG analog may not necessarily intensify the inflammation especially given the chronicity and mild nature of the inflammation in FHI. However, I doubt that adding a PG analog as a fourth medication will improve IOP control as much as we would like it to. But since we are left with no other non-aggressive treatment options at this point, it may be worth a short trial.

Most likely the patient will require incisional surgery since laser trabeculoplasty is unlikely to help and not indicated. There is no firm evidence in the literature to guide us in the choice of surgery in this particular case. Young age, pseudophakia, and especially presence of chronic inflammation are factors that could lead some glaucoma specialists to do a primary glaucoma drainage procedure. However, given the intact nature of the superior perilimbal conjunctiva and the fact that the patient will likely need more than one glaucoma procedure in his lifetime, personally I would prefer a trabeculectomy with mitomycin-C as initial surgery. Intensive preoperative treatment with steroids is not required since the uveitis in FHI is typically not responsive to steroids. If the first trabeculectomy fails despite optimal perioperative care, I would then implant a glaucoma drainage device in the superotemporal quadrant. My device of choice would be a 350 mm² Baerveldt implant with no antimetabolites.

Suggested Readings

1. Chee SP, Jap A. Presumed fuchs heterochromic iridocyclitis and Posner-Schlossman syndrome: comparison of cytomegalovirus-positive and negative eyes. Am J Ophthalmol 2008;146:883-889.
2. de Visser L, Braakenburg A, Rothova A, de Boer JH. Rubella virus-associated uveitis: clinical manifestations and visual prognosis. Am J Ophthalmol 2008;146:292-297.
3. Van Gelder RN. Idiopathic no more: clues to the pathogenesis of Fuchs heterochromic iridocyclitis and glaucomatocyclitic crisis. Am J Ophthalmol 2008;145:769-771.
4. de Groot-Mijnes JD, de Visser L, Rothova A, Schuller M, van Loon AM, Weersink AJ. Rubella virus is associated with Fuchs heterochromic iridocyclitis. Am J Ophthalmol 2006;141:212-214.
5. Quentin CD, Reiber H. Fuchs heterochromic cyclitis: rubella virus antibodies and genome in aqueous humor. Am J Ophthalmol 2004;138:46-54.
6. La Hey E, de Vries J, Langerhorst CT, Baarsma GS, Kijlstra A. Treatment and prognosis of secondary glaucoma in Fuchs' heterochromic iridocyclitis. Am J Ophthalmol 1993;116:327-340.

Navid Nilforoushan, MD

Based on the available data, this is a fairly young patient with unilateral mild chronic iridocyclitis, moderately advanced open angle glaucoma and history of cataract surgery. Apparently the patient has had no symptoms of ocular discomfort such as redness, pain and photophobia. In a patient with chronic unilateral iridocyclitis and glaucoma, three differential diagnoses should be considered: FHI, glaucomatocyclitic crisis and herpetic uveitis. No signs or symptoms of corneal involvement in the past and present, diffuse uniform iris atrophy, and lack of synechiae formation all point against a diagnosis of herpetic uveitis. The first two diagnoses can be quite similar in signs: diffuse iris atrophy and hypochromia, no tendency for synechiae formation and fine diffuse KPs. The main cause for seeking medical attention in FHI is decreased vision from cataract formation; in contrast patients with glaucomatocyclitic crisis (Posner-Schlossman syndrome) usually have recurrent attacks of mild ocular discomfort associated with blurred and halo vision. Between episodes, the eye is quiet and there are no signs of inflammation such as KPs, anterior chamber cells and flare. In this patient with open angle glaucoma, unilateral iridocyclitis, lack of synechiae, clear cornea, fine diffuse KPs and past history of cataract surgery, one would consider an initial diagnosis of FHI and therefore, further systemic evaluation is not required. Regarding treatment, my initial choice would be trabeculectomy with high concentrations of mitomycin-C (0.04%). In addition, 7-10 days before surgery I would prescribe topical and systemic steroids to stabilize the blood-aqueous barrier and decrease postoperative inflammation. If this fails I would opt for a shunt procedure.
Consultants

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