



THE OCULAR IMMUNOLOGY
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Secondary Glaucoma

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Secondary glaucoma (SG) associated with uveitis is a challenging condition to manage, often with a frustrating outcome.¹ This problem has not been extensively addressed in the literature, and it seemed to us that it might be an under-appreciated yet important cause of vision loss in the population of patients with uveitis. Our study of 1,254 patients with uveitis disclosed that nearly 10% had glaucoma as an additional vision-robbing feature of their disease, adding yet another dimension to the difficulties already posed by the inflammatory insult to the macula. Our data were similar to prior reports of the prevalence of glaucoma associated with selected specific uveitic entities.²⁻¹²

The prevalence has been especially alarming in juvenile rheumatoid arthritis-associated uveitis. The prevalence in our JRA patients was not as high as that published in some prior studies, perhaps because of our philosophy of intolerance to chronic, even "low grade" inflammation and to chronic steroid use. Chronic granulomatous anterior uveitis was the most frequent uveitis classification associated with SG in our patients, and in previous reports.^{13,14} But SG was common in posterior and panuveitis and also was found in patients with pars planitis. The most common presentation of SG was open angle (80% of the eyes). As mechanical blockage of the trabecular meshwork is usually a transient condition that responds to anti-inflammatory therapy,¹ glaucoma could be caused by microscopic outflow dysfunction due to inflammatory proteins, debris and cells, or normal serum components that may clog the trabecular meshwork.^{1,15} In some specific inflammatory diseases (typically Posner-Schlossman syndrome), active substances of inflammation like prostaglandins and substance P have been implicated as causes of secondary open angle glaucoma, with important consequences for therapy. ^{1,4}

Uveitic SG may also could be related to trabecular endothelial cell loss secondary to aggressive phagocytic activity and autolysis.¹⁶⁻¹⁸ Since trabecular meshwork is a part of the uveal tract, it may become directly involved in the inflammatory process (trabeculitis),¹⁹ a putative common mechanism for glaucoma in herpetic uveitis. Peripheral anterior synechiae were found in 14% of the SG affected eyes. Ultrasound biomicroscopy of the anterior segment may be used to detect alterations of angle and ciliary body structures in patients with uveitis and hazy media and may help in elucidating mechanisms of glaucoma in these patients. Although most of SG cases were secondary to idiopathic uveitis, sarcoid and JRA-associated uveitis, a study of the relative frequency of SG per disease showed that herpes virus (simplex and zoster) associated uveitis was most likely to cause SG (23%). Previous reports showed similar rates (13-33%), addressing the importance of glaucoma for the visual outcome in these patients.⁴

Since chronic oral acyclovir therapy reduces the recurrence rate of uveitis in patients with HSV uveitis,²⁰ we believe that the increasing frequency of this therapeutic strategy will lower the relative frequency of SG in herpes virus-associated uveitis populations in coming years.

SG was present in 16% of our JRA-associated uveitis patients; other authors report¹⁴ to 27%.^{3,8,21} (of JRA-associated iridocyclitis patients developing glaucoma.) This is particularly troubling since this disease occurs in children and chronic inflammation that has so often been present before and after involvement of an ophthalmologist.²² Such chronic or recurrent inflammation may explain why 7 of 11 JRA-associated uveitis patients with glaucoma had uncontrolled glaucoma at the time of the data analysis. Four patients (5 eyes) had had argon laser trabeculoplasty performed as part of their treatment. Four of the 5 eyes (80%) were therapeutic failures and trabeculectomy was then performed. In three of the 5 eyes which had ALT, an acute flare-up of uveitis occurred following the procedure despite pre-treatment with topical steroids. We do not advocate ALT as part of our treatment regimen in patients with uveitis related glaucoma.

This report examined patients with uveitis related secondary glaucoma seen at a tertiary referral center during a ten year period. Our surgical procedure of choice in patients with uncontrolled uveitis related glaucoma was conventional trabeculectomy until 1990. Our current procedure of choice is a mitomycin-C trabeculectomy or insertion of a drainage implant in those patients who fail medical therapy. Siegner et al recently reported on their experience with the Baerveldt glaucoma drainage implant.²³ Successful outcome was achieved in 10 of the 11 patients with uveitic glaucoma following insertion of the drainage implant. Our experience has been similar and we believe that these newer surgical treatment modalities will be of great benefit to our uveitic glaucoma patients. But real progress in this area of uveitis-associated glaucoma will only come with the increasing recognition by ophthalmologists that total, earlier control of intraocular inflammation, employing a step-ladder approach to achieve that goal is more in the overall interests of the patient than is "acceptance" of low grade chronic inflammation.

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