

CASE PRESENTATION

A 52-year-old male has a 5-year history of glaucoma and has been undergoing treatment with a prostaglandin analogue. At his 6-month follow-up visit, his IOP measures 28 mm Hg OU with central corneal thicknesses of 515 μm bilaterally. In both of his eyes, visual field testing confirms early changes, and alterations in the optic disc are evident with ocular coherence tomography.

How would you manage this patient?

Expert 1:

In freshly diagnosed glaucoma with early visual field loss, the Collaborative Initial Glaucoma Treatment Study's strategy of lowering the IOP by a minimum of 35% (and more, according to a sliding scale related to the degree of damage) worked exceptionally well, as there was no average visual field progression in 5 years.¹

In the present case, however, there should be a 5-year track record to take into account when deciding how to proceed. Unfortunately, critical information is missing in the given scenario, including the initial untreated pressures, the patient's response to the prostaglandin in a uniocular trial, whether his fields and discs have been stable or progressed, and his tolerance of the therapy and compliance with it and scheduled visits.

If the patient seems to adhere to prescribed therapy, his pressures represent a 35% or greater reduction of IOP (which is unlikely), and his visual fields and optic discs have been stable since diagnosis, it is conceivable that no changes are required. On the other hand, documented progression coupled with lapses in the use of medication or follow-up would warrant glaucoma surgery (primary glaucoma drainage implant or trabeculectomy with mitomycin C). If the patient's visual fields are stable and his IOP has gradually risen after an initially positive response to the prostaglandin analog (and his angles remain open), then I would employ stepwise additions of medication and laser trabeculoplasty to reach a target pressure that was 35% below the initial level. If his IOPs were reduced by 20%, but the target IOPs were not reached, I would weigh the benefits and risks of surgical intervention versus close observation, while taking into account the wishes of the patient. If his IOPs were not reduced by 20%, I would recommend surgery.

Expert 2:

This patient needs a lower IOP. Given his status and risk factors (race, relatively young age, thin corneas, high IOPs, and already manifestly impaired visual function), I would be more comfortable if the patient's IOPs were in the midteens. There are several options, including adding medications. It is unlikely that a single adjunctive medication will decrease his IOP to the midteens, because beta blockers, carbonic anhydrase inhibitors (CAIs), and adrenergic agonists generally do not reduce IOP by more than 10 mm Hg when added to a prostaglandin analog. More likely, multiple adjunctive medications will be required. A fixed-combination product (such as dorzolamide/timolol or the newly approved brimonidine/timolol) could be used without

drug-class redundancy. In the absence of a need for an acute and dramatic reduction in IOP (as in advanced disease), however, I prefer not to add more than one agent at a time.

As an alternative to adjunctive medical therapy, laser trabeculoplasty may be of benefit in this patient's management. If successful, this procedure offers the advantage of an incremental reduction in IOP with no commensurate increase in his drug regimen's complexity.

Based on published data and my own experience, I would offer this patient either a topical CAI dosed twice daily to both eyes or bilateral 360° selective laser trabeculoplasty (SLT). The recommended dosing for topical CAIs is t.i.d., but, in combination with a prostaglandin analog, b.i.d. dosing provides a comparable reduction of IOP while minimizing the drug regimen's complexity.^{2,3} In fact, both of these options might be required to reach a safe IOP level. If we started with the CAI, I would assess his IOP at least twice after a minimum of 4 weeks on dual therapy before determining whether SLT were still indicated. If we proceeded with SLT first, I would assess his IOP 4 weeks after treatment. If his IOP had decreased by 3 mm Hg or more, I would recheck his pressures monthly for progressive effects from SLT until they reached a plateau and would then decide whether the CAI were indicated.

Regardless of which treatment we selected, I would accept an IOP that was below 20 mm Hg and would follow the patient to better characterize his clinical course and the variation in his IOP over time. I would advance therapy if his IOP remained above 20 mm Hg or if it crept up over 20 mm Hg after initially falling lower. These steps would dictate any further changes in the patient's therapy over time.

Expert 3:

I would first discuss with this relatively young patient his risk of vision loss from glaucoma, and I would establish a target pressure range that would likely be in the low teens. As with any patient, I would try to ascertain his level of compliance and consider switching to a different prostaglandin analog. I would also discuss the possibility of laser therapy (argon laser trabeculoplasty or SLT) as a safe adjunctive procedure.⁴ If the patient deferred the laser therapy or did not respond significantly to the treatment, I would recommend a topical CAI twice a day.³ If necessary, my next step would be to add or substitute a beta blocker dosed once in the morning.³ A fixed combination of a beta blocker and topical CAI would be an alternative and might improve his compliance.⁵ Brimonidine could be added if the target range had not been reached. I would point out to the patient, however, that the addition of a third or fourth agent has a relatively low probability of success (IOP lowering of 20% or more) at 6 months and 1 year.⁶

For follow-up visits, I would see the patient at different times of day in order to ascertain the range of his IOPs on a given regimen. If glaucomatous progression and/or not meeting the targeted IOP range led me to consider surgical intervention, I would recommend a trabeculectomy. This patient's age and established field loss suggest that his target IOP should be in the low teens, and trabeculectomy would be the most likely means of achieving this goal. I would offer the patient the alternative of a tube. I would explain to him that complications are less common than with trabeculectomy but that it would likely be necessary to add medications within the first couple of years postoperatively in order to achieve or maintain the target IOP.^{7,8}

Expert 4 (Dr. Rajul Parikh)

The purpose of treatment is the prevention of disability or, if a disability already exists, the prevention of further harm or the restoration of health. In this case, the issue is one of prevention. When the IOP is below 30 mm Hg, the relationship between it and disability is so poor that it almost need not be considered. Four factors are essential: (1) how much glaucomatous damage is already present; (2) how rapidly the damage is progressing; (3) the person's life expectancy; and (4) socioeconomic factors such as the patient's ability to care for himself.

Regarding the first factor, the case presentation states that the patient has early visual field loss. Without treatment, he will almost certainly develop more damage, and he consequently has a high chance of developing symptoms and disability. Because the patient did not start with any field loss, this damage obviously developed. The presence of visual field loss is a highly specific prognostic sign that damage will continue, and the rate of change of damage is the most valuable sign of continuing deterioration.⁹

Almost nothing is known of the patient's rate of change. Based on the case presentation, I will assume that, 5 years previously, he had symmetrical optic nerves that appeared completely normal (obviously, he would not have had visual field loss at that time). For visual field loss to occur, the rim usually must narrow such that the rim/disc ratio is less than 0.1 in an average-sized disc. The deterioration of the optic nerve from having no to marked narrowing of the rim (< 0.1 rim/disc ratio) in 5 years is a strong indication that, in another 5 years, all tissue of the rim will disappear in at least one area and his visual field damage will be symptomatic.

It is impossible to know how long this patient will live based on the case presentation. If he is in good health, not overweight, and not a smoker, and if he does not have a family history of premature death, then the patient may well live into his 80s. No information is provided on the patient's socioeconomic status.

Based on the listed assumptions, the overwhelming likelihood is that this patient will become disabled from his glaucoma unless further damage is prevented. Because the level of pressure at which he developed damage is unstated (his initial pressure may have been 50 mm Hg in each eye, and his disease may have been perfectly stable at pressures of 28 mm Hg in the last 5 years), no meaningful assessment can be made of how much his IOP must decrease.