

Quality of Life for Glaucoma Patients

Do we need a new definition for successful outcomes?

BY ROBERT J. NOECKER, MD, MBA

Visual outcomes increasingly drive ophthalmologists' criteria for successful cataract and refractive surgery. In fact, many surgeons now use the term *refractive cataract surgery* to emphasize the need for optimal visual results in all patients. In refractive studies, an outcome in which fewer than 90% of eyes achieved an uncorrected visual acuity of 20/20 or better would be met with skepticism. Our standards for visual outcomes after glaucoma surgery, however, are much different. In many ways, this is to be expected, because our primary goal is to reduce IOP to a level that slows or halts disease progression.

Evidence suggests that we need to be more attuned to the entire visual needs of our patients. The counterargument is that glaucoma is a blinding eye disease, and, the more advanced the disease is or the younger patients are, the more likely they are to lose vision simply from having more life years at risk. This often means a more aggressive treatment regimen, which invariably leads to more complications. It is thus a balance between what we hope is best for the patient and the risks of getting there.

We worry about IOP targets, the number of medications that patients can tolerate, and the type of surgical therapy that will work best if medications cannot achieve our goal. As it turns out, our patients may not be thinking along exactly the same lines.

In one study, researchers asked 82 people with glaucoma what they considered to be the most important factors regarding their treatment. Without a doubt, these individuals were most concerned about moderate visual impairment that could have an impact on their freedom and the risk of blindness. They were less concerned about treatment modality and showed no clear preference for medical therapy versus surgical intervention. In addition, the patients surveyed for the study were quite willing to endure lifelong treatment in exchange for the smallest reduction in visual loss or blindness.¹

Although this study comprised a small number of patients, the results raise an important question: Are we

"We worry about IOP targets, the number of medications ..., and the type of surgical therapy that will work best if medications cannot achieve our goal. ... Patients may not be thinking along exactly the same lines."

doing all we can to provide our patients with the best quality of life (QOL) at the same time we are working to manage and control their disease? This article explores, and attempts to answer, that question in the hope of changing our current thinking about a successful outcome in glaucoma management.

IS THE CURE WORSE THAN THE DISEASE?

Our Current Approach

The current standard in glaucoma treatment is medications first in the US, often in combination with laser trabeculoplasty if drug therapy does not achieve the desired reduction in IOP. If treatment with laser trabeculoplasty fails, then we consider an incisional surgical intervention such as trabeculectomy. If this procedure fails as well, we look to glaucoma drainage devices to control the patient's IOP.

The trouble with this approach is that, by the time the patient arrives in the OR, his vision may already be significantly compromised. As a result, any further reduction in vision, however slight, can significantly affect his daily life and ability to function independently.

Impact on Vision

Our current treatment approach represents a significant trade-off. Our normal definition of success in glaucoma surgery is lowering the patient's IOP to our target pressure. A qualified success is the need for medications after surgery but still achieving the targeted IOP. The last scenario

we tend to think about is a negative outcome. For example, suppose a patient had hypotony that took 1 month to resolve. Does that still qualify as successful surgery? Generally, we would categorize the case as a “win,” but is that accurate if the patient suffers from poor vision while the hypotony resolves and he is faced with daily visits for monitoring? A review of outcomes in glaucoma treatment from the peer-reviewed literature since 2001 underscores this issue.

A study on the long-term outcomes of filtration surgery found that the probability of progression to blindness after 10 years was 46%. The investigators noted that patients who had a greater amount of visual field loss at the time of surgery were the most likely to go blind.²

Various reports from the Advanced Glaucoma Intervention Study (AGIS) have also looked at outcomes after treatment. Part 8 of the AGIS reports found that trabeculectomies increased the risk of cataract formation by 78%.³ Part 11 concluded that the key risk factors for failed trabeculectomies and argon laser trabeculoplasty were younger age at the time of surgery, higher IOP at the time of treatment, and postoperative complications.⁴ A report on the predictive factors for visual field loss found that older age at the time of first treatment and greater fluctuation in IOP increased the likelihood of progression by 30%.⁵

In one of the few studies to observe visual outcomes, researchers compared the results of primary trabeculectomy by residents at a public hospital with those of other published studies. The investigators found that 44% of patients had improved or stable best corrected visual acuity, whereas 56% lost two or more lines of best corrected visual acuity. The researchers concluded that the results and rate of complications in this study were similar to those in other published reports.⁶

A review of trabeculectomy's complications among patients enrolled in the Collaborative Initial Glaucoma Treatment Study (CIGTS) concluded that the incidence of complications was high, with early complications reported in 50% of subjects.⁷ Of the 300 patients (465 total surgeries), the following complications occurred in 10% or more of cases: a shallow or flat anterior chamber (13%); an encapsulated bleb (12%); ptosis (12%); a serous choroidal detachment (11%); and anterior chamber bleeding or hyphema (10%).

By no means an exhaustive list, the aforementioned research has two major implications. First, the majority of studies focusing on outcomes in glaucoma look primarily at the efficacy of IOP reduction as the key definition of success. Second, few studies examine subjects' visual outcomes. Those that do show that most patients experience a decline in vision as a result of glaucoma treatment.

Visual decrease after glaucoma surgery can occur for numerous reasons. The Collaborative Normal-Tension Glaucoma Study showed that the risk of decreased vision due to cataract was significantly greater in the surgical group compared with the control group.⁸

Impact on QOL

Few studies have assessed the impact of glaucoma treatment on patients, although a number illustrate how the loss of vision affects a patient's QOL. In 1997, Gutierrez et al compared visual field defects to the responses of 147 glaucoma patients using three different surveys: the National Eye Institute Visual Functioning Questionnaire; the Visual Function-14; and the Medical Outcomes Study 36-Item Short Form. They found that the greater the visual field defect was in the patient's better eye, the worse that individual's perceptual scores were on the National Eye Institute's questionnaire and the Visual Function-14. The investigators suggested that clinicians should use these questionnaires in order to gain a better understanding of glaucoma treatment's outcomes.⁹ Spaeth et al reached a similar conclusion in a review of QOL assessments in glaucoma patients.¹⁰ The CIGTS found the following through QOL questionnaires: “In these newly diagnosed glaucoma patients, symptoms of depression and altered mood were related to worse self-reported visual function as assessed by the VAQ, but not to monocular clinical measures of visual function.”¹¹

A review from 2003 suggested that glaucoma patients experience diminished visual function and, as a result, a poorer QOL.¹² The investigators noted that, although there is a growing awareness among physicians and researchers of the need to evaluate visual and QOL outcomes, there is little agreement on how best to achieve this goal.

Finally, a review of the economic impact of glaucoma treatment published last year concluded that existing estimates of the indirect costs of glaucoma undervalue the impact that visual field loss has on patients' daily functioning and QOL.¹³

SHOULD SUCCESS BE DEFINED DIFFERENTLY?

One possible way to redefine success would be to consider these criteria: (1) no additional decline in vision after glaucoma surgery; (2) desired reduction in IOP over an acceptable period of time; and (3) a minimal number of postoperative visits. For example, 1 week of daily postoperative visits for a patient who has undergone filtration surgery should be unacceptable. We should strive for a follow-up visit on postoperative day 1 and then again 1 or 2 weeks later, as we do for cataract surgery patients.

EARLIER SURGICAL INTERVENTION

The Literature

Is earlier surgical intervention an option in preserving more of our patients' vision? The answer is often yes. In my experience, the earlier the surgeon intervenes, the better the outcomes will be. Certainly, concerns about patients' adherence to (and ability to afford) a complex drug regimen (four or five medications) have generally shortened the time to surgery. On the other hand, many of the current surgical treatments for glaucoma, particularly trabeculectomy and the implantation of a glaucoma drainage device, carry such a high risk of complications that delaying surgery as long as possible is reasonable.

"Some surgeons may question whether patients would accept earlier surgical intervention. I think it is more a matter of how much a particular treatment disrupts their daily lives."

Little has been published on the costs and benefits of earlier surgical intervention, particularly in the past 10 years. In the late 1980s and early 1990s, Jay et al compared a series of patients who underwent early trabeculectomy and a group treated with medical therapy and then trabeculectomy.^{14,15} In terms of visual outcomes, the results favored earlier surgical intervention. The investigators concluded that, in cases of severe primary open-angle glaucoma (POAG), the risks of delaying surgery were greater than those of performing a trabeculectomy as the primary treatment.¹⁵ A subsequent cost analysis by the same group concluded that earlier surgical intervention was less expensive over an 8-year follow-up period.¹⁶

A randomized 1994 study compared the outcomes of early trabeculectomy, laser trabeculoplasty, and medication in 168 patients. Early surgery produced the greatest reduction in IOP and the least visual field deterioration.¹⁷ Another study concluded that early trabeculectomy in POAG provided the greatest reduction in IOP without adverse effects.¹⁸

Not all studies, however, have reached the same conclusion. The interim reports from the CIGTS found few differences in the results of the medical and surgical treatment groups 5 years after surgery. The investigators concluded that there was no need to recommend a move to earlier surgery.^{19,20}

Nevertheless, Schmier et al concluded that the cost of glaucoma is lower when the disease is in its early

stage, which suggests that accurate diagnostic tools and earlier intervention could save money. The investigators found it surprising how few studies have evaluated the cost and effectiveness of glaucoma treatments given the prevalence of the disease in North America and Europe.¹³ That stated, it is up to the treating physician to customize the care of a given patient based on that individual's risk/reward profile. The more aggressive treatment should be applied to patients with more disease and a higher risk of progression.

Patients' Acceptance

Some surgeons may question whether patients would accept earlier surgical intervention. I think it is more a matter of how much a particular treatment disrupts their daily lives. If they can return to work relatively quickly and they do not experience a significant loss of vision, patients will be much more accepting of surgery.

A key factor may well be education. One study divided 60 patients into three groups: group 1 underwent conventional medical management; group 2 underwent early trabeculectomy; and group 3 received an educational packet about POAG before being given the option of early trabeculectomy. Sixty-five percent of those in group 3 opted for an early trabeculectomy after reviewing the educational material. The mean IOP 1 year postoperatively was lower in the eyes that underwent trabeculectomies, although there was no statistical difference in visual acuity and subjective satisfaction among the three groups.¹⁸

When the CIGTS group assessed subjects' fear of blindness, they found that (1) fear was not related to the treatment group (surgical or medical) to which the patient had been assigned and (2) fear had more to do with patients' perceptions of their ability to perform a given task than their actual visual performance. The investigators concluded that more needed to be done at the time of diagnosis, as well as over the course of treatment, to help patients more fully understand their disease.²¹

Are Less-Invasive Procedures the Answer?

One option to make earlier surgical intervention more palatable to both the surgeon and the patient is to find treatment options that are less invasive and associated with minimal postoperative complications. Numerous clinical studies now underway are looking at different methods of reducing IOP without the need for a filtering bleb, which—although it serves an important purpose—contributes to the high level of complications after filtration surgery.

(Continued on page 33)

(Continued from page 32)

Whichever technique or device turns out to be most effective, the goals of glaucoma surgery should begin to match those for cataract surgery: a 15-minute procedure performed on an outpatient basis that requires a similar postoperative course of follow-up visits. The procedure must be highly effective at reducing IOP to targeted levels in the early postoperative period, with a high degree of predictability regarding the postoperative course. There should be no trade-offs in pressure reduction or preoperative visual acuity. □

Robert J. Noecker, MD, MBA, is Vice Chair and Director of Glaucoma Service at the UPMC Eye Center and the University of Pittsburgh's Department of Ophthalmology. He is also an associate professor at the University of Pittsburgh School of Medicine. Dr. Noecker may be reached at (412) 647-5753; noeckerrj@upmc.edu.



1. Bhargava JS, Patel B, Foss AJE, et al. Views of glaucoma patients on aspects of their treatment: an assessment of patient preference by conjoint analysis. *Invest Ophthalmol Vis Sci*. 2006;47:2885-2888.
2. Parc CE, Johnson DH, Oliver JE, et al. The long-term outcome of glaucoma filtration surgery. *Am J Ophthalmol*. 2001;132:27-35.
3. AGIS Investigators. The Advanced Glaucoma Intervention Study: 8. Risk of cataract formation after trabeculectomy. *Arch Ophthalmol*. 2001;119:1771-1779.
4. AGIS Investigators. The Advanced Glaucoma Intervention Study: 11. Risk factors for failure of trabeculectomy and argon laser trabeculoplasty. *Am J Ophthalmol*. 2002;134:481-498.
5. Nouri-Mahdavi K, Hoffman D, Coleman AL, et al. Predictive factors for glaucomatous visual field progression in the Advanced Glaucoma Intervention Study. *Ophthalmology*. 2004;111:1627-1635.
6. Chan CK, Lee S, Sangani P, et al. Primary trabeculectomy by residents at a county hospital. *J Glaucoma*. 2007;16:52-56.
7. Jampel HD, Musch DC, Gillespie BW, et al. Perioperative complications of trabeculectomy in the Collaborative Initial Glaucoma Treatment Study (CIGTS). *Am J Ophthalmol*. 2005;140:16-22.
8. The effectiveness of intraocular pressure reduction in the treatment of normal-tension glaucoma. Collaborative Normal-Tension Glaucoma Study group. *Am J Ophthalmol*. 1998;126:498-505.
9. Gutierrez P, Wilson MR, Johnson C, et al. Influence of glaucomatous visual field loss on health-related quality of life. *Arch Ophthalmol*. 1997;115:777-784.
10. Spaeth G, Walt J, Keener J. Evaluation of quality of life for patients with glaucoma. *Am J Ophthalmol*. 2006;141(suppl):S3-S14.
11. Jampel HD, Frick KD, Janz NK, et al; CIGTS Study Group. Depression and mood indicators in newly diagnosed glaucoma patients. *Am J Ophthalmol*. 2007;144:238-244.
12. Altangerel U, Spaeth G, Rhee D. Visual function, disability and psychological impact of glaucoma. *Curr Opin Ophthalmol*. 2003;14:100-105.
13. Schmier JK, Halpern MT, Jones ML. The economic implications of glaucoma: a literature review. *Pharmacoeconomics*. 2007;25:287-308.
14. Jay JL, Allan D. The benefit of early trabeculectomy versus conventional management in primary open angle glaucoma relative to severity of disease. *Eye*. 1989;3:528-535.
15. Jay JL, Murray SB. Early trabeculectomy versus conventional management in primary open angle glaucoma. *Br J Ophthalmol*. 1988;72:881-889.
16. Ainsworth JR, Jay JL. Cost analysis of early trabeculectomy versus conventional management in primary open angle glaucoma. *Eye*. 1991;5:322-328.
17. Migdal C, Gregory W, Hitchings R. Long-term functional outcome after early surgery compared with laser and medicine in open-angle glaucoma. *Ophthalmology*. 1994;101:1651-1656.
18. Anand A, Negi S, Khokhar S, et al. Role of early trabeculectomy in primary open-angle glaucoma in the developing world. *Eye*. 2007;21:40-45.
19. Lichter PR, Musch DC, Gillespie BW, et al. Interim clinical outcomes in the Collaborative Initial Glaucoma Treatment Study comparing initial treatment randomized to medications or surgery. *Ophthalmology*. 2001;108:1943-1953.
20. Janz NK, Wren PA, Lichter PR, et al. The Collaborative Initial Glaucoma Treatment Study: interim quality of life findings after initial medical or surgical treatment of glaucoma. *Ophthalmology*. 2001;108:1954-1965.
21. Janz NK, Wren PA, Guire KE, et al. Fear of blindness in the Collaborative Initial Glaucoma Treatment Study Patterns and Correlates over time. *Ophthalmology*. 2007;114:2213-2220.