# EDITORIALS

## Glaucoma Tube or Trabeculectomy? That Is the Question

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IN MOST OF THE DEVELOPED WORLD, INCISIONAL GLAUcoma surgery is performed to establish definitive intraocular pressure (IOP) control when maximal patient benefit has been achieved from medical therapy and laser surgery. The incisional surgical options include a trabeculectomy or, in certain cases, a glaucoma drainage device (GDD) as a primary or secondary procedure. Historically, GDDs have been reserved for recalcitrant cases, those that have failed to respond to trabeculectomy or those at great peril for trabeculectomy scarring—in other words, those cases that are likely to fail to respond to any further surgical intervention. Too often, these high-risk eyes do poorly, resulting in a sense of frustration in the surgeon and a reluctance among some surgeons to recommend a GDD except as a last resort. But in spite of the high-risk profile of patients enrolled onto previous GDD studies, moderately good success with various designs of GDDs has been observed.[1] Consequently, practice patterns of other ophthalmologists have moved more toward GDDs as the preferred surgical procedure when treating complex cases of glaucoma.[2,3] It became clear that a randomized study was required to reconcile these differences. The two articles by Gedde and associates in this issue[4,5] provide the first multicenter, controlled clinical trial examining the efficacy and outcomes of nonvalved GDDs vs trabeculectomy with mitomycin C in similar patient populations with previous ocular surgery. The first-year data provide compelling evidence that, if confirmed with longer follow-up, will give us an evidence basis about what to recommend for the surgical management of complicated glaucoma.

The most provocative data presented in this study are the excellent primary outcomes at one year in both the tube and trabeculectomy groups. The mean IOP was not greatly different between the two groups. The trabeculectomy group had a larger percentage of complete successes (no adjunctive medical therapy), but the percentage of overall success rate (eyes with our without supplemental medical therapy) was higher in the tube group. Failure was defined as IOP persistently >21 mm Hg or not reduced by 20% from baseline, IOP ≤5 mm Hg, reoperation for glaucoma, or loss of light-perception vision. There was a higher failure rate in the trabeculectomy group than the tube group: the cumulative probability of failure was 3.9% for tubes as opposed to 13.5% for trabeculectomies at one year, an excellent record for both groups.

This higher rate of failure among trabeculectomies could have been partly the result of an arbitrary definition of hypotony, and possibly it could have resulted from an infrequent follow-up schedule during the first postoperative month. The study defined failure related to hypotony as an IOP ≤5 mm Hg. Hypotony accounted for three trabeculectomy failures and no tube failures in the Tube Versus Trabeculectomy (TVT) study. But often, patients with postoperative IOP levels in this range are visually asymptomatic and represent a favorable surgical outcome, and not a failure of the treatment. Trabeculectomies generally require more frequent follow-up visits in the first month than do tubes, to allow for timely suture release and other maneuvers. Although surgeons were allowed as many visits as they thought necessary, the study required only three visits in the first month in both groups, and it is possible that the standardized schedule led to more trabeculectomy failures.

Also notable was the surprising equivalence of intraoperative complications in the two groups. A far higher incidence of postoperative complications was encountered in the trabeculectomy group; however, serious complications causing reduced vision and/or the need for reoperation were comparable between the two groups. Gedde and associates also found that the presence of an intraoperative or postoperative complication did not increase the risk of treatment failure. This is in contrast to what was found previously by the Advanced Glaucoma Intervention Study (AGIS) study.[6] One important finding is a solitary case of endophthalmitis encountered in the trabeculectomy group. Further follow-up will be necessary to discover whether additional cases of this devastating complication will appear.

The rate of postoperative complications in the tube group was less than has been previously reported. For

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example, choroidal effusions were encountered in only 16% of patients in the tube group of this study, but it occurred in between 23% to 32% in previous series.[6–8] Also in this study, a shallow or flat anterior chamber developed in only 11% of cases, as opposed to 32%, as reported by Siegner and associates.[7] Persistent corneal edema developed in only 7% of cases in this study, in contrast to rates ranging from 8% to 20% in other studies.[9] It could be that the eyes eligible for and randomized to the TVT study were at lesser risk for complications than those enrolled onto previous studies. Certainly, the low rate of tube complications is encouraging for those who advocate an earlier and wider use of GDD surgery in glaucoma. On the other hand, it is likely that surgeons less experienced in GDD surgery than the investigators chosen for the TVT study might experience a higher complication rate.

The TVT study has done a great service to the ophthalmic community with the design and conduct of this study. Because every case is different, and because surgical techniques are constantly evolving, it is difficult to perform randomized trials of surgical therapy. With the first-year results reported in this issue of THE JOURNAL, the roles of trabeculectomy vs GDDs have become further clarified, and this insight will prove instrumental to later decision-making processes in the surgical management of glaucoma. If these results are sustained in future years, we look forward to an enhanced role of GDDs in the management of glaucoma in the future.

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