A couple of decades ago, the only option considered for the first surgical approach to lowering intraocular pressure (IOP) was a trabeculectomy. However, over the past two decades, numerous techniques have been developed to challenge the primary role of the trabeculectomy. Despite the significant strides that alternative surgical procedures have made, I will argue that trabeculectomy still reigns as king when it comes to the initial surgical treatment of glaucoma.

Let’s discuss the other procedures that might displace trabeculectomy, starting with cataract surgery. Cataract surgery by phacoemulsification has been shown to lower IOP. However, the effect in eyes without terribly high IOP to begin with is small, does not begin to approach the mean 40% IOP reduction that we can expect from trabeculectomy, and will rarely deliver the IOP in the low teens or even lower that many surgeons desire for their glaucoma patients. For patients with bona fide glaucoma with visual field loss, cataract surgery alone is not the best option for lowering IOP.

Trabectome, canaloplasty, and endolaser cyclophotocoagulation of the ciliary processes are recent techniques that can lower IOP without producing a filtration bleb, the Achilles’ heel of trabeculectomy. Trabectome surgery removes trabecular meshwork and inner wall of Schlemm’s canal from an ab interno approach. It does not “spend” conjunctiva that may be necessary for future glaucoma surgery and can be done in phakic and pseudophakic eyes. However, it does not often result in IOP below the midteens and is not appropriate for eyes needing lower IOP.

Canaloplasty, like trabectome, does not produce a bleb, but does require extensive conjunctival and sclera surgery, reducing the options available for future surgery, and like trabectome, will not produce really low IOP. Endolaser cyclophotocoagulation is not possible in phakic eyes, and the general bias in the glaucoma community against procedures that damage the ciliary processes currently preclude its consideration as a primary surgery.

The Express mini shunt has been portrayed as an alternative to trabeculectomy, but is really just a variation on trabeculectomy. One is still creating a hole in the eye wall covered by a partial thickness scleral flap, and the formation of a bleb is an integral part of the operation. The Express mini shunt variant of the trabeculectomy does eliminate the need to excise a small piece of the eye wall and the need to perform an iridectomy, but at the price of introducing a metallic foreign body into the eye. The rationale for implanting the Express mini shunt must be either greater effectiveness in lowering IOP, or greater safety. In one small, single surgeon, randomized clinical trial in the Netherlands, de Jong reported greater effectiveness with the Express mini shunt compared to trabeculectomy, and a similar complication rate. The success rate for trabeculectomy, however, was unusually low in that study. Maris et al. retrospectively compared the Express mini shunt to trabeculectomy and found similar success rates, but the Express eyes had a lower incidence of early postoperative hypotony.

Aqueous drainage device surgery certainly merits legitimate consideration as an initial incisional surgery for glaucoma. Following on the heels of the Tube vs. Trabeculectomy study, the Primary Tube vs. Trabeculectomy (PTVT) study is now underway to answer precisely the question being addressed in this debate, i.e. which is the better primary operation, tube or trabeculectomy? I argue that until we have the results of the PTVT study, we should continue to regard trabeculectomy as our initial surgical approach for most types of glaucoma. My reservations about aqueous drainage device (ADD) surgery as initial surgery are fourfold. First, although the TVT results are encouraging, in a study with much longer follow-up than the TVT, Stein et al. have reported more serious complications, such as endophthalmitis and retinal detachment, after ADD surgery than after trabeculectomy. Second, there are unresolved concerns about the long-term effect of ADD tubes upon the cornea. Third, the need for a patch graft over the tube introduces a second foreign body onto the surface on the eye, with the possibility of further complications. Lastly, the use of suture release techniques in trabeculectomy and post-operative use of antifibrosis agents gives the surgeon the power to modify a trabeculectomy after surgery, an opportunity not usually possible with ADD surgery.

I share the hope of my colleague that the procedures that I have mentioned will eventually displace trabeculectomy as the best choice for initial surgery. However, with the current state of the art it is still the trabeculectomy, even with all its warts, that has the best risk/benefit ratio. For that reason, I encourage those of you in the audience who perform glaucoma surgery to continue to regard trabeculectomy as your initial choice.

References