Highlights of the AGS Annual Meeting

The latest research findings from the 25th annual meeting of the American Glaucoma Society, held February 26 to March 1, 2015, in Coronado, California.

BY GEOFFREY T. EMERICK, MD

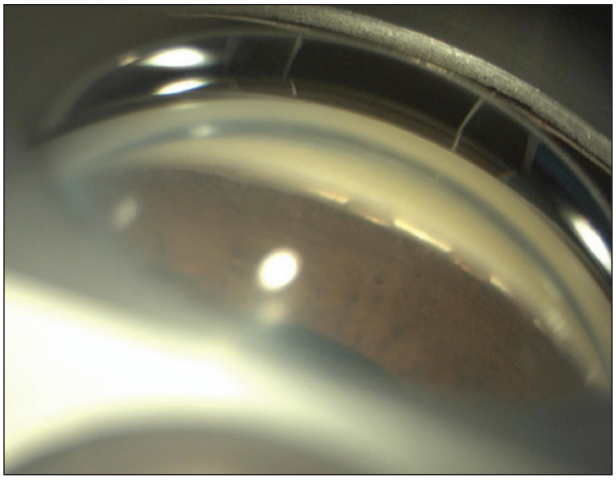
Every year, the meeting of the American Glaucoma Society (AGS) features presentations of the best in glaucoma research. This year, 965 registrants enjoyed 124 poster and 25 paper presentations as well as a joint symposium with the North American Neuro-Ophthalmology Society, Glaucoma Surgery Day, and many other opportunities to share ideas and information. The AGS lecture, delivered by Paul P. Lee, MD, JD, was one of many highlights. As has been the case for the past few years, microinvasive glaucoma surgery (MIGS) was prominent on the agenda. From the many excellent studies presented at the AGS Meeting, I have chosen some with the most immediate clinical relevance.

MICROINVASIVE GLAUCOMA SURGERY

Intracanalicular Microstent

The iStent Trabecular Micro-Bypass Stent (Glaukos) received FDA approval in June 2012 for the treatment of mild to moderate open-angle glaucoma. Current approval is for a single iStent, placed into the canal of Schlemm under gonioscopic guidance at the time of cataract surgery. The Hydrus Microstent (Ivantis) is also an intracanalicular device, but it scaffolds the canal over a much longer distance, 3 clock hours. Thomas Samuelson, MD, presented the results of a 2-year, randomized, multicenter study of this device implanted at the time of cataract surgery (Figure 1).[1] The study was conducted at seven centers in Europe; a similar but larger clinical trial (Hydrus IV) is currently enrolling patients in the United States.

The study's design reflects newer, more rigorous standards for MIGS studies: medication washout is performed at baseline and at 12 and 24 months, and diurnal IOP is measured. This approach allows for a direct comparison of the surgery's effect independent of medications. One hundred patients were enrolled, with one eye entered into the study. Half underwent cataract surgery alone, and half also received the Hydrus implant. Prior to washout at baseline, mean IOP was about 18.7 mm Hg on an average of two medications. The baseline washout diurnal IOP was 26.4 mm Hg. At 24 months, washed-out diurnal IOP was 16.9 mm Hg in the device group versus 19.2 mm Hg in controls. In addition, 73% of patients in the device group were on no medications versus 38% of controls. No serious complications were seen; some eyes in the device group developed focal peripheral anterior synechiae, but this did not seem to affect the stent's function.



(Courtesy of Thomas W. Samuelson, MD.)

Figure 1. The Hydrus Microstent under gonioscopy.

Subconjunctival Shunts

A more traditional approach to glaucoma surgery is to shunt aqueous into the subconjunctival space. The results of the trials of two devices intended to improve the success of such surgery were presented.

The InnFocus MicroShunt (InnFocus) is 8.5 mm long with a lumen diameter of 70 µm. The device is made of poly(styrene-block-isobutylene-block-styrene) or SIBS, a nonreactive polystyrene. This material has been successfully used in drug-eluting coronary stents and has been shown to be less inflammatory than silicone.[2] In the surgery, a conjunctival peritomy is performed, the shunt

is placed in the anterior chamber through a 25-gauge needle tract, and it exits 3 mm posterior to the limbus.

In a study presented by Paul Palmberg, MD, PhD,[3] 50 eyes of 50 patients received the InnFocus MicroShunt, alone or in combination with cataract surgery. Mitomycin C was applied intraoperatively. Main outcome measures included success rate (IOP ≤ 21 mm Hg and ≥ 20% IOP reduction), IOP, medication use, and adverse events. Twenty-two patients were evaluated at 3 years. The qualified success rate (with or without medication) was 96%; the complete success rate was 73%. Mean IOP decreased from a mean of 23.5 to 10.7 mm Hg, and glaucoma medications were reduced from 2.7 to 0.5. Some transient hypotony occurred but resolved spontaneously. There were no sight-threatening, long-term adverse events.

The Xen45 (AqueSys) is a cross-linked gel implant, 6 mm in length with a 45-µm lumen (Figure 2). It has been approved for use in Europe and Canada but is still investigational in the United States. Mitomycin C 0.2 mg/mL in 0.2 mL is injected into the subconjunctival space, and the shunt is placed via an ab interno approach through a clear corneal incision into that space. Ike Ahmed, MD, presented the findings of a study of 57 patients in whom the gel stent was implanted.[4] The mean preoperative IOP was 26.7 mm Hg. The mean postoperative IOP was 12 mm Hg at 12 months. The number of glaucoma medications decreased from a mean of 3.6 preoperatively to 0.6 at 12 months. Six eyes (11%) required needling in the postoperative period. There were no cases of persistent hypotony.

Gonioscopy-Assisted Transluminal Trabeculotomy

Gonioscopy-assisted transluminal trabeculotomy (GATT), another MIGS procedure, is a method of performing a 360° trabeculotomy without a conjunctival incision. Initial results in open-angle glaucoma have been promising,[5] and two studies presented at the meeting examined the procedure's use in specific situations.

The first was a review of results in 14 eyes of 10 patients with primary congenital glaucoma and juvenile open-angle glaucoma undergoing GATT.[6] All patients had at least 12 months' follow-up. They ranged in age from 17 months to 30 years. Postoperative hyphema occurred in five (36%) of the eyes, which all cleared by 1 month. The mean IOP decreased from 27.3 to 14.8 mm Hg, and the mean number of medications required dropped from 2.6 to 0.9. None of the operated eyes required subsequent pressure-lowering surgery.

A second study reviewed results in 35 eyes undergoing GATT after previous glaucoma surgeries,[7] including trabeculectomy (n = 17), tube shunt (n = 13),

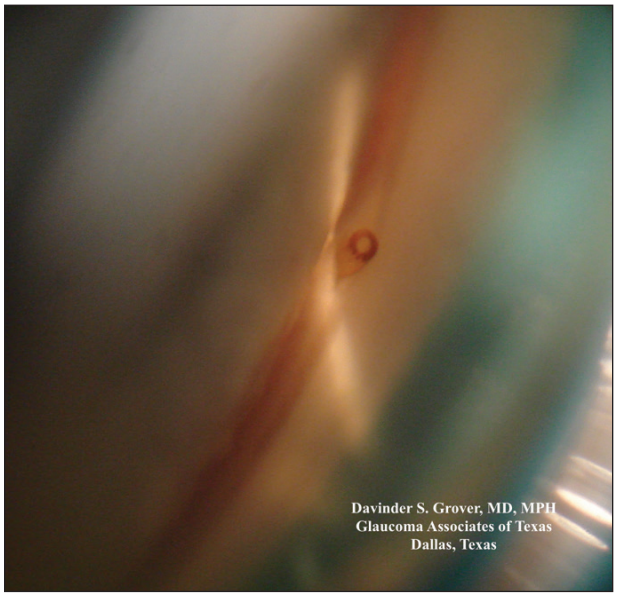


Figure 2. The Xen45 Gel Stent.

Trabectome (NeoMedix; n = 4), Ex-Press Glaucoma Filtration Device (Alcon; n = 4), and endocyclophotocoagulation (n = 5). The mean preoperative IOP measured 25.7 mm Hg on 3.2 medications and decreased to 15.9 mm Hg on 2.3 medications at 18 months. One week after surgery, 12 (34%) eyes had hyphema, which cleared by 1 month. Eyes with prior cataract extraction were at higher risk for failure. The cumulative proportion of failure (either reoperation or IOP not lowered by 20%) was 30% at 18 months.

In summary, GATT appears to be effective and safe in a range of patients with glaucoma. Although the presenters recommended starting by using the iTrack (Ellex) microcatheter, the procedure can also be performed using a 4–0 nylon suture, a lower-cost alternative.

DISPARITIES IN GLAUCOMA CARE

Two studies reviewed large databases to examine two sides of a similar issue: who is less likely to undergo glaucoma testing, and who is more likely to present with advanced glaucoma? The first reviewed the billing history of 9,444 people with commercial insurance and 2,123 Medicaid recipients with newly diagnosed glaucoma.[8] The investigators found that 63% and 53% of commercially insured patients versus 35% and 30% of Medicaid patients had visual field tests or imaging (mostly optical coherence tomography), respectively, during the 15 months after diagnosis. No testing at all was billed in 22% of commercial patients versus 49% of

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Medicaid patients. The odds of receiving no testing was 3.4 for Medicaid patients as a whole, but it was 4.1 for black Medicaid patients. The researchers concluded that, regardless of race or ethnicity, Medicaid recipients receive much less follow-up testing for glaucoma than patients with commercial insurance.

The second study examined factors associated with an initial presentation of severe-stage glaucoma compared to mild- or moderate-stage disease.[9] It included 2,535 patients with newly diagnosed glaucoma. The proportion with mild-, moderate-, and severe-stage disease was 55.0%, 31.7%, and 13.3%, respectively. Men had a 54% increased risk of presenting with severe glaucoma, and Asian Americans had a 108% increased risk. There was no significant difference in the odds of presenting with severe disease for blacks or Latinos relative to whites. Finally, people with higher incomes (≥ $125,000/y) were much less likely to present with severe glaucoma than those with lower incomes (< $30,000/y). The investigators attributed the higher risk in Asian Americans to an increased incidence of low-pressure glaucoma, which may be detected later.

Both of these studies point to persistent and significant socioeconomic disparities in glaucoma care. ■

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