A CLOSER LOOK AT MIGS

Recent research analyzed various MIGS procedures for the treatment of open-angle glaucoma and patient populations often underrepresented in clinical trials.

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MINIMALLY INVASIVE GLAUCOMA SURGICAL TECHNIQUES FOR OPEN-ANGLE GLAUCOMA: AN OVERVIEW OF COCHRANE SYSTEMATIC REVIEWS AND NETWORK META-ANALYSIS

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ABSTRACT SUMMARY
A meta-analysis summarized data from randomized clinical trials (RCTs) of MIGS for the treatment of open-angle glaucoma that were evaluated in a set of Cochrane reviews published before June 2021. The methodologic precision of the reviews was assessed using the AMSTAR 2 appraisal tool, and random-effects network meta-analyses were conducted.

The investigators assessed the proportion of participants who did not need IOP-lowering medication after surgery in the short term (< 6 months), medium term (6–18 months), and long term (> 18 months).

Six eligible Cochrane reviews that described 6- and 60-month MIGS outcomes were identified that studied trabecular bypass (iStent [Glaukos] and Hydrus Microstent [Alcon]), ab interno trabeculectomy (Trabectome, MicroSurgical Technology), subconjunctival (Xen Gel Stent [Allergan] and MicroShunt [Santen]) and supraciliary drainage (CyPass MicroStent; device no longer available), and endoscopic cyclophotocoagulation (ECP). No RCTs of subconjunctival implants and ECP were found to include in the review. Moderate-certainty evidence implied that combining cataract surgery with Hydrus implantation safely improved the likelihood of drop-free glaucoma control in the medium term and long term and conferred a 2 mm Hg greater IOP reduction in the long term compared to cataract surgery alone. Combining cataract surgery with the implantation of an iStent also safely improved drop-free glaucoma control compared to cataract surgery alone, but the short-term IOP-lowering effect of the device was not sustained. The addition of a CyPass improved drop-free glaucoma control compared to cataract surgery alone, but the short-term IOP-lowering effect of the device was not sustained. The addition of a CyPass improved drop-free glaucoma control compared to cataract surgery alone, but the short-term IOP-lowering effect of the device was not sustained. The addition of a CyPass improved drop-free glaucoma control compared to cataract surgery alone, but the short-term IOP-lowering effect of the device was not sustained. The addition of a CyPass improved drop-free glaucoma control compared to cataract surgery alone, but the short-term IOP-lowering effect of the device was not sustained. The addition of a CyPass improved drop-free glaucoma control compared to cataract surgery alone, but the short-term IOP-lowering effect of the device was not sustained.

DISCUSSION
What is an AMSTAR 2 appraisal tool, and what is a network meta-analysis?

AMSTAR 2 is a 16-question critical appraisal tool for systematic reviews that includes studies of health care interventions. The tool was developed to allow researchers to identify and evaluate high-quality systematic reviews of RCTs and nonrandomized clinical trials.

A network meta-analysis extends principles of meta-analysis to evaluate the comparative effectiveness of different treatments in a single analysis. This is achieved by combining direct and indirect evidence. Direct evidence refers to evidence obtained from RCTs. For example, in a trial comparing treatments A and B, direct evidence is the estimate of relative effects between A and B. Indirect evidence refers to the evidence obtained from studies with a mutual comparator such as a placebo. Synonymous—but less frequently used—terms for network meta-analysis are mixed treatment comparisons and multiple treatments meta-analysis.
Did the meta-analysis identify gaps in MIGS knowledge?

No published RCT has compared ECP or subconjunctival MIGS drainage devices with other glaucoma treatments. The European Glaucoma Society stated that there is insufficient evidence to compare any MIGS procedure with another MIGS procedure or trabeculectomy. The AAO preferred practice patterns identified several MIGS procedures for which evidence is scarce, including ab interno trabeculectomy with a Kahook Dual Blade (KDB; New World Medical), goniotomy with a Goniotome (MicroSurgical Technology), gonioscopy-assisted transluminal trabeculotomy, and ab interno canaloplasty.

At the time of this writing, two dozen registered MIGS RCTs were listed as planned or recruiting on the National Institutes of Health’s website ClinicalTrials.gov. These RCTs should build the evidence for MIGS. Ideally, the effectiveness of MIGS procedures will be assessed with objective measures of glaucomatous progression such as visual fields—something that has been lacking in most MIGS trials. Future studies should also consider the cost-effectiveness of MIGS and its financial implications for individuals and healthcare systems. As with all new surgical offerings, time and follow-up studies are required to evaluate which MIGS procedures are optimal for which patients and for which stage and type of glaucoma.

Outcomes of Resident Performed Hydrus, iStent, and Kahook Glaucoma Procedures in a Predominantly African American Population

Meer E, Liu T, Hua P, Ying GS, Miller E, Lehman A

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ABSTRACT SUMMARY

A retrospective study examined the safety and efficacy of the Hydrus Microstent, iStent, and KDB combined with cataract surgery when performed by residents in a predominantly African American population at the Philadelphia Veterans Affairs Hospital. The adjusted mean IOP reduction was greater at day 1 and week 1 with the Hydrus and KDB, respectively, but no significant difference in IOP reduction was found between groups at subsequent postoperative (9–12 months) visits. Higher preoperative IOP was the only significant predictor of greater IOP reduction. Similarly, the number of medication classes used preoperatively—not the MIGS procedure—was a significant predictor of the postoperative reduction in the number of medication classes and total daily drops a patient required.

STUDY IN BRIEF

A retrospective study evaluated the safety and efficacy of three different MIGS procedures in a predominantly African American patient population.

WHY IT MATTERS

The study provides data on a patient population that is often underrepresented in clinical trials. The study is also based on real-world rather than clinical trial data. There was no washout period. Surgeons’ level of experience varied, patient demographics were diverse, and a variety of surgical devices and methods of IOP measurement was employed.
No significant differences were found in IOP or reduction in medication burden 9 to 12 months after study eyes underwent cataract extraction with MIGS procedures using the Hydrus, iStent, or KDB. Preoperative IOP and preoperative number of medication classes were the only significant predictors of IOP reduction and medication reduction, respectively.

**DISCUSSION**

How does the study relate to the COMPARE study?

The COMPARE study was a prospective randomized trial that compared the Hydrus and iStent as standalone treatments for open-angle glaucoma. The trial found a higher surgical success rate and a greater reduction in the number of medications required in patients who received the Hydrus versus those who received two iStents (generation 1) at 12 months but found no significant difference in IOP reduction between the groups.

In contrast, MIGS type was not a significant predictor of IOP or medication reduction when the procedure was combined with phaco cataract surgery in the study by Meer and colleagues. A factor that might have contributed to the difference between the findings of Meer and colleagues and the COMPARE study is their patient populations. The patients in the study by Meer and colleagues were predominantly male (95.9%) and African American (70.7%). In the COMPARE study, 42% to 45% of patients were male, and 1% to 4% were African American.

Another difference between the two studies is that patients in the COMPARE study completed a medication washout period, so the mean preoperative IOP was higher than in the study by Meer et al.

Would outcomes have differed if the procedures had not been performed by residents?

Numerous studies have shown that cataract surgery performed by residents has a higher but acceptable rate of complications compared to cataract surgery performed by attendings. Meer et al retrospectively compared the safety and efficacy of three MIGS procedures performed by resident physicians. Two cases of vitreous loss related to cataract surgery but no complications related to MIGS were reported. Resident surgeries are supervised by attending surgeons, and intraoperative MIGS complications such as the misplacement of an iStent or Hydrus would likely have been corrected. There may, however, be potential for other issues. Additional research is required to evaluate whether the rate of complications is higher when MIGS is performed by residents versus attendings.


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