

# THE INCIDENCE OF ENDOPHTHALMITIS AFTER MIGS



Looking for risk factors and differences among procedures.

BY SAYYADA (MAELA) HYDER, MD, AND SARAH H. VAN TASSEL, MD

## ENDOPHTHALMITIS AFTER MINIMALLY INVASIVE GLAUCOMA SURGERY

**Starr MR, Huang D, Israilevich RN, et al<sup>1</sup>**  
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### ABSTRACT SUMMARY

This descriptive, retrospective case series assessed the rates and characteristics of endophthalmitis after MIGS combined with cataract surgery or performed alone. The study included all cases of endophthalmitis after MIGS that were diagnosed and treated at Wills Eye Hospital, including cases from outside surgeons. Only surgeries performed by glaucoma specialists affiliated with Wills were used to calculate the prevalence of endophthalmitis because a denominator of cases was readily identifiable. The study included MIGS procedures with and without the use of an implant. The former included the placement of an iStent (Glaukos), Xen Gel Stent (AbbVie), Hydrus Microstent (Alcon), and CyPass Microstent (Alcon; no longer available). The nonimplant MIGS procedures included goniotomy, trabeculotomy, and gonioscopy-assisted transluminal trabeculotomy. Patients who underwent additional and recent intraocular procedures and those with systemic infections that could predispose them to endophthalmitis were excluded.

## STUDY IN BRIEF

▶ A retrospective analysis of endophthalmitis data from a single center offering MIGS found a prevalence rate of 0.13% (95% Poisson CI, 0.04%–0.30%). Cases of endophthalmitis were associated with MIGS procedures involving an implantable device. No cases of endophthalmitis were associated with nonimplant MIGS. Among eyes with positive culture results, *Staphylococcus epidermidis*, *Staphylococcus aureus*, and various other species of *Staphylococcus* were identified.

### WHY IT MATTERS

In recent years, MIGS has gained popularity as an alternative to incisional glaucoma surgery. The advantages of MIGS include a better safety profile than incisional glaucoma surgery, ease of implantation, and success with concomitant cataract surgery.<sup>2</sup> The literature on endophthalmitis after MIGS, however, is limited.

This study assessed the incidence and clinical features of endophthalmitis noted after MIGS, including stratification based on procedure type. The study authors suggested that endophthalmitis after MIGS may result from more virulent organisms than endophthalmitis following standalone cataract surgery. Understanding the risks associated with surgical procedures, including endophthalmitis, can help ophthalmologists make better-informed recommendations to patients and counsel them appropriately.

A total of 979 patients were diagnosed with endophthalmitis during the study (October 1, 2015–July 1, 2020). Thirteen of these cases (1.3%) occurred following MIGS. Four of the 13 surgeries resulting in endophthalmitis were performed by Wills-affiliated surgeons, leading to a prevalence rate of 0.13% or one in 769 patients (95% Poisson CI, 0.04%–0.30%). Of the 13 endophthalmitis cases, nine were associated with the iStent, three with the Xen Gel Stent, and one with the CyPass Microstent.

No cases of endophthalmitis were identified in the nonimplant MIGS cohort (437 patients). Three patients had a delayed presentation (one due to chronic endophthalmitis and two due to Xen Gel Stent exposure).

Seven patients who developed endophthalmitis following MIGS had a positive culture. The most common organisms were various *Staphylococcus* species (57.1%), followed by *Staphylococcus epidermidis* (28.5%) and *Staphylococcus aureus* (14.3%).

## DISCUSSION

### How do the results of this study fit with those of clinical trials?

Data on the risk of endophthalmitis following MIGS are limited. The pivotal trials for the various implantable MIGS devices identified zero cases—not surprising given the rarity of this complication. The study by Starr et al<sup>1</sup> adds to the literature by characterizing the rate of post-MIGS endophthalmitis and describing its clinical presentations. A more

complete picture of the risk profiles of various surgical procedures could help guide ophthalmologists' surgical recommendations.

### What are the real-world implications of the study?

Interestingly, the study by Starr et al<sup>1</sup> suggests that the prevalence of endophthalmitis after MIGS combined with cataract surgery and after cataract surgery alone is similar. The bacterial organisms that

caused endophthalmitis after the combined procedure, however, were potentially more virulent than those expected after cataract surgery alone, which raises the possibility of poorer treatment outcomes.

The study analyzed patients who came to Wills Eye Hospital for endophthalmitis management. It thus could have underestimated the prevalence of this complication by missing patients who sought care elsewhere.

## EARLY ENDOPTHALMITIS INCIDENCE AND RISK FACTORS AFTER GLAUCOMA SURGERY IN THE MEDICARE POPULATION FROM 2016 TO 2019

SABHARWAL J, DAI X, DUN C, ET AL<sup>3</sup>

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### ABSTRACT SUMMARY

This retrospective, longitudinal study assessed the incidence of and risk factors for developing endophthalmitis within 42 days of undergoing glaucoma surgery alone, cataract surgery combined with glaucoma surgery, or cataract surgery alone in a US Medicare population from 2016 to 2019. Glaucoma procedures included in the study were categorized as tube shunt surgery, trabeculectomy, MIGS, and other. The last largely consisted of the placement of a Xen Gel Stent or Ex-Press glaucoma filtration device (Alcon).

The incidence of endophthalmitis after glaucoma surgery alone, combined cataract and glaucoma surgery, and cataract surgery alone was 1.5 (95% CI, 1.3–1.7), 1.1 (95% CI, 1.0–1.2), and 0.8 (95% CI, 0.8–0.8)

per 1,000 procedures, respectively. Among patients who underwent glaucoma surgery only, the rates of endophthalmitis per 1,000 surgeries were 2.0 (95% CI, 1.6–2.5) for tube shunts, 1.5 (95% CI, 1.2–1.9) for trabeculectomy, and 1.1 (95% CI, 0.8–1.4) for MIGS. When each of these glaucoma surgeries was combined with cataract surgery, the rates of endophthalmitis per 1,000 surgeries were 1.9 (95% CI, 0.9–2.9), 1.4 (95% CI, 0.9–1.9), and 1.0 (95% CI, 0.9–1.1), respectively.

Multivariable logistic regression models were used to identify risk factors associated with postoperative endophthalmitis. When compared to MIGS, only tube shunts were noted to be a statistically significant risk factor for the development of endophthalmitis. Additionally, a high Charlson Comorbidity Index score was a statistically significant risk factor for endophthalmitis after both standalone glaucoma surgery and combined cataract and glaucoma surgeries.

## STUDY IN BRIEF

► A longitudinal retrospective study using US Medicare claims data showed the incidence of endophthalmitis after glaucoma surgery alone, cataract surgery combined with glaucoma surgery, and standalone cataract surgery to be 1.5 (95% CI, 1.3–1.7), 1.1 (95% CI, 1.0–1.2), and 0.8 (95% CI, 0.8–0.8) per 1,000 procedures, respectively. Standalone MIGS and combined cataract and MIGS procedures had endophthalmitis rates of 1.1 and 1.0, respectively (not statistically different). A high Charlson Comorbidity Index score, a marker of comorbid disease, was a consistent risk factor for endophthalmitis after glaucoma surgery regardless of whether it was combined with cataract extraction.

## WHY IT MATTERS

This is the first large US Medicare claims study to compare rates of endophthalmitis between tube shunt surgery, trabeculectomy, and ab interno nonbleb MIGS as standalone procedures and when performed in combination with cataract surgery. Information on the risk of endophthalmitis with these different surgical strategies can help surgeons develop personalized glaucoma treatment plans for each patient.

► THE LITERATURE

**DISCUSSION**

**How does MIGS categorization factor into the interpretation of this study's results?**

Although the risks of endophthalmitis after glaucoma surgery are well known, stratification based on surgical subtype (tube shunt, trabeculectomy, and MIGS) is a unique aspect of the study by Sabharwal et al.<sup>3</sup> In particular, the exclusion of the Xen Gel Stent from the MIGS category is an important difference between this study and that by Starr et al.<sup>1</sup> The approach by Sabharwal et al permitted a more granular look at endophthalmitis risk after the ab interno angle surgeries studied, both when they were combined with cataract surgery and when they were standalone procedures, a growing utilization. The distinctions are

important because MIGS is becoming one of the most commonly performed groups of glaucoma surgeries.<sup>4</sup>

**How did MIGS and trabeculectomy compare?**

Interestingly, the rates of endophthalmitis after MIGS and trabeculectomy were similar, whether glaucoma surgery was performed as a standalone procedure or in combination with cataract surgery. This finding differs from conventional wisdom about the safety profile of MIGS and suggests that further research using large datasets is necessary. ■

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**MEDICAL REVIEWER JAMES C. TSAI, MD, MBA**

- President, New York Eye and Ear Infirmary of Mount Sinai, and Delafield-Rodgers Professor and System Chair, Department of Ophthalmology, Icahn School of Medicine at Mount Sinai, New York
- Member, *Glaucoma Today*\* Editorial Advisory Board
- jtsai@nyee.edu
- Financial disclosure: Consultant (AI Nexus Healthcare, Eyeovia, Smartlens)

**SAYYADA (MAELA) HYDER, MD**

- Ophthalmology resident, Weill Cornell Medicine, New York
- sah4015@nyp.org
- Financial disclosure: None

**SARAH H. VAN TASSEL, MD**

- Associate Professor of Ophthalmology, Weill Cornell Medicine, New York
- sjh2006@med.cornell.edu
- Financial disclosure: Consultant (AbbVie, Alcon, Glaukos, New World Medical)