

Anticipating and Handling IFIS

A strategic approach makes the condition manageable.

BY SAMUEL MASKET, MD

An awareness of the potential for intraoperative floppy iris syndrome (IFIS) at the time of cataract surgery is the key to its management. Tools include presurgical topical agents, intracameral mydriatics, mechanical pupillary dilators, highly viscous ophthalmic viscosurgical devices (OVDs), and an alteration of fluidic infusion, although not all of these measures may be needed in every case. A sequential approach with these strategies should allow cataract surgery to be routine in a patient at risk of IFIS.

WHO IS AT RISK?

Clearly, patients whose medical history includes the use of tamsulosin, a uroselective α -1 antagonist, and similar agents are at significant risk of IFIS.¹ Moreover, individuals may exhibit IFIS even after using tamsulosin for a short time or after discontinuing use of the drug.

In a study of cataract extractions performed by residents, the reported incidence of posterior capsular rupture and vitreous loss was 7.4% in patients taking tamsulosin compared with 1.8% in patients not taking the drug.² When IFIS is anticipated and proper managerial strategies are used, however, the outcome is likely favorable, and the complication rate is low for both skilled surgeons and residents.²⁻⁴ For that reason, I consider all patients who have used tamsulosin to be at risk of IFIS, and I plan accordingly.

PREOPERATIVE EXAMINATION

Management begins with a careful medical history and preoperative examination that specifically considers pharmacologic dilation of the pupil. My personal experience agrees with the literature: the larger the pupil dilates in response to mydriatics and cycloplegics, the less likely IFIS is to manifest. In essence, if the pupil enlarges to more than 7 mm, the risk is low.⁵ If the pupillary response is less than desirable, I prepare for extended surgical time and the use of pupillary expanding devices (Malyugin Ring [MicroSurgical Technology], iris hooks, etc.).

Techniques for stretching the pupil without an indwell-

ing device are counterproductive. Additionally, poor dilation rules out the use of the femtosecond laser in cataract surgery unless the laser can be used in a sterile fashion and mechanical enlargement of the pupil can be performed in advance of ablation, as has been reported.⁶ The findings and implications of IFIS should be discussed with the patient.

PHARMACOLOGIC DILATION

The next step in management is pharmacologic dilation in advance of surgery. While routine agents and intracameral mydriatics are helpful, I have reported the successful use of topical atropine sulfate 1% as an adjunct prior to surgery.⁷ Although atropine does not increase maximal pupillary dilation, in my experience (S.M., unpublished data, 2011), this agent helps to prevent intraoperative miosis, the first manifestation of IFIS. I therefore continue to use the drug in



Figure 1. After the presurgical topical administration of atropine sulfate 1%, phenylephrine HCl 2.5%, and tropicamide 1%, the pupillary diameter is approximately 4 mm. (Note the fine 5.75-mm mark on the cornea.) Intracameral epinephrine HCl 1:4,000 and lidocaine HCl 1% (both nonpreserved and bisulfite free) are administered via a paracentesis.

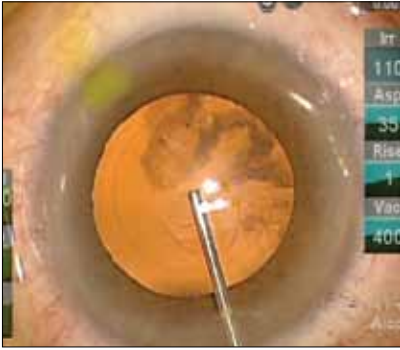


Figure 2. A supercohesive OVD is added. The pupil's size is approximately 7 mm. (Note the fine 5.75-mm mark on the cornea.)

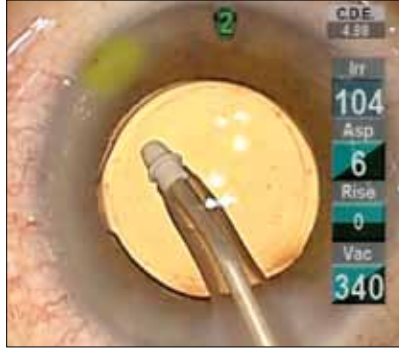


Figure 3. After cataract removal and IOL implantation, the pupillary diameter has remained larger than 6 mm.

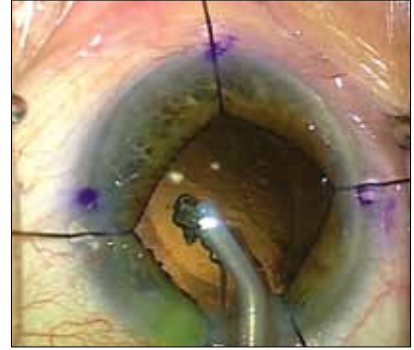


Figure 4. A poorly dilating pupil requires the use of iris hooks, five of which were placed in a pentagonal fashion.

conjunction with routine dilating agents and intracameral mydriatics.

Atropine sulfate requires topical application well before surgery. At present, I have patients apply the 1% solution t.i.d. for 2 full days before the cataract procedure. It is essential that the patient not discontinue oral medications for benign prostatic hyperplasia unless a prostatectomy has been performed, because systemic absorption of the topically applied atropine may cause acute urinary retention.

At surgery, after the patient has undergone routine pupillary dilation (phenylephrine 2.5% and tropicamide 1%), I evaluate the size of the pupil and administer intracameral mydriatics. Although nonpreserved, bisulfite-free epinephrine (1:4,000) admixed with nonpreserved 1% lidocaine is preferred, its availability and stability are a chronic problem. At present, therefore, I use a mixture of nonpreserved, bisulfite-free 1.5% phenylephrine and 1% lidocaine. The synergism of direct stimulation of the dilator muscle combined with maximum pupiloplegia from atropine is robust, because progressive intraoperative miosis is the hallmark of IFIS.

INTRAOPERATIVE MEASURES

I inject a supercohesive OVD and reassess the size of the pupil (Figures 1-3). If it is 6 mm or smaller, I place a Malyugin Ring or iris retractors and commence with surgery (Figure 4). Should the pupil be adequately dilated, however, I proceed with surgery but reduce the height of the infusion bottle and the aspiration flow rate to lessen their tendency to remove the OVD. I also find it preferable to avoid infusing balanced salt solution under the iris during phacoemulsification, because the fluid may cause a floppy iris to billow and prolapse. If, on the other hand, as many surgeons have noted, the infusate flows atop the iris, IFIS is far less likely to develop. In cases of suspected IFIS, I make certain to chop the nucleus under

low flow and then bring the nuclear pieces into the iris plane or above for final emulsification and aspiration. It may be necessary from time to time to re-inject the OVD.

On the unlikely occasion when an adequately dilated pupil constricts markedly during surgery and the instillation of additional viscoelastic proves ineffective, it may be necessary to place mechanical dilators midsurgery. In these circumstances, I find it safer and easier to use iris hooks rather than the Malyugin Ring or other expanders.

CONCLUSION

Surgeons can manage IFIS by anticipating its occurrence and following an appropriate strategy, but there is no magic bullet. Rather, a stepwise approach is logical. Recognition of the possibility of IFIS, presurgical pharmacology, intraoperative mydriasis, the appropriate use of OVDs, altered fluidics, and mechanical pupillary expanders, when necessary—all contribute to routine outcomes. ■

Samuel Masket, MD, is a clinical professor at the David Geffen School of Medicine, Jules Stein Eye Institute, UCLA, and is in private practice in Los Angeles. He acknowledged no financial interest in the product or company mentioned herein. Dr. Masket may be reached at (310) 229-1220; avcmasket@aol.com.



1. Chatziliaili IP, Sergentanis TN. Risk factors for intraoperative floppy iris syndrome: a meta-analysis. *Ophthalmology*. 2011;118(4):730-735.
2. Chen AA, Kelly JP, Bhandari A, Wu MC. Pharmacologic prophylaxis and risk factors for intraoperative floppy-iris syndrome in phacoemulsification performed by resident physicians. *J Cataract Refract Surg*. 2010;36:898-905.
3. Chang DF, Osher RH, Wang L, Koch DD. Prospective multicenter evaluation of cataract surgery in patients taking tamsulosin (Flomax). *Ophthalmology*. 2007;114:957-964.
4. Palea S, Chang DF, Rekkik M, Regnier A, Lluell P. Comparative effect of alfuzosin and tamsulosin on the contractile response of isolated rabbit prostatic and iris dilator smooth muscles: possible model for intraoperative floppy-iris syndrome. *J Cataract Refract Surg*. 2008;34:489-496.
5. Casuccio A, Cillino G, Pavone C, et al. Pharmacologic pupil dilation as a predictive test for the risk for intraoperative floppy-iris syndrome. *J Cataract Refract Surg*. 2011;37:1447-1454.
6. Conrad-Hengerer I, Hengerer FH, Schultz T, Dick HB. Femtosecond laser-assisted cataract surgery in eyes with a small pupil. *J Cataract Refract Surg*. 2013;39(9):1314-1320.
7. Masket S, Belani S. Combined preoperative topical atropine sulfate 1% and intracameral nonpreserved epinephrine hydrochloride 1:4000 [corrected] for management of intraoperative floppy-iris syndrome. *J Cataract Refract Surg*. 2007;33(4):580-582. Erratum in: *J Cataract Refract Surg*. 2007;33(7):1145