IFIS: When Nothing Is As It Seems

Several management strategies are available for each stage of surgery and for a range of complications associated with this syndrome.

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Since it was first described by Chang and Campbell in 2005,1 intraoperative floppy iris syndrome (IFIS) has become a major concern for cataract surgeons. The syndrome involves three telltale symptoms: (1) a billowing iris that does not reach stable mydriasis despite sufficient administration of dilating agents, (2) progressive intraoperative miosis, and (3) a tendency for iris prolapse during surgery (Figure 1). When IFIS is not anticipated or is not recognized by the surgeon, the risk for myriad intraoperative complications increases. The range of complications includes limited view of the surgical area and injury to the iris resulting from manipulation of the surgical instruments. In rare cases, posterior capsular rupture (PCR) can occur, leading to loss of lens material into the vitreous cavity.1-4

The cause of IFIS has been identified as the intake of systemic alpha-adrenoceptor antagonists (alpha-blockers), drugs prescribed in men for lower urinary tract syndromes such as benign prostatic hyperplasia.1 The most popular drug of this kind, tamsulosin, has been shown to dramatically increase the risk for IFIS, and other drugs in the class have also been implicated.2,3 In their retrospective study, Chang and Campbell noted IFIS in 63% of patients taking tamsulosin, leading to a tenfold increase in PCR.1 A meta-analysis showed that the odds ratio for IFIS was elevated by a factor of 40 in tamsulosin patients.5

CAUSES AND SIGNS OF IFIS

Looking at pharmacologic and pathophysiologic principles, two paths are responsible for IFIS: (1) The direct effect of alpha-blockers on iris receptors reduces the power of dilating agents and (2) ultrastructural changes lead to irreversible functional loss in the smooth muscle tissue of the iris and to chronic loss of muscular tension, with or without the presence of dilating drugs.6,7

At the start of surgery, a moderately dilated pupil can lead to an underestimation of problems to come. This treacherous period of peace often lasts until the moment of hydrodissection, when turbulence manifests in the anterior chamber. Suddenly, the extent of IFIS becomes visible in its entirety, and the iris moves with the least amount of intracameral flow. Iris prolapse and damage resulting from manipulation of surgical instruments, including pigment loss and stromal lesions, can lead to an unfavorable result.

Following is a list of pre- and intraoperative measures and techniques that can help one to avoid further complications in the event of IFIS, as well as one measure that seems logically as though it would help, but does not.
PREOPERATIVE MEASURES

Include alpha-blockers in preoperative medical history. When general practitioners (GPs) conduct preoperative work-ups in patients taking alpha-blockers, in most cases their interest focuses on cardiovascular risks and patients’ use of anticoagulants, as the connection between the intake of alpha-blockers and intraoperative cataract surgery complications is largely unknown to primary-care physicians. In a study by Sallam et al, 96.8% of responding GPs stated that the correlation was unknown to them or not taken into account, and nearly 80% said they prescribed tamsulosin more than five times a month.8

This lack of information among GPs has been identified as the most salient risk factor for complications related to alpha-blocker intake, and, as a result, the number of published studies in urology, general, and family medicine journals describing IFIS outside the ophthalmic community has increased in recent years.9-11

Prescribe atropine eye drops. Although atropine is no longer in common use in ophthalmology because of its long duration of action, some surgeons prescribe topical use of this cycloplegic agent for 2 to 3 days prior to surgery for patients with known intake of alpha-blockers.12

Reduce intraocular pressure (IOP). To prevent uncontrolled iris movement and iris prolapse, a patient’s IOP should be lowered prior to surgery. The oral carbonic anhydrase inhibitor acetazolamide—if not contraindicated—and thorough use of oculopressure are effective for this purpose.

Discontinue the alpha-blocker? It seems only logical to discontinue a drug that can cause considerable complications. Unfortunately, this is not a solution to the problem. Tamsulosin and other alpha-blockers have long half-lives and can remain in the anterior chamber as long as 28 days after discontinuation.13 Moreover, alpha-blockers cause ultrastructural changes in the iris stroma that can prevent functional recovery long after discontinuation.6,7

INTRAOPERATIVE MEASURES AND TECHNIQUES

Good preoperative preparation is important in the management of IFIS, but when the syndrome occurs intraoperatively there are a couple of aces you will be happy to have up your sleeve.

Apply intracameral epinephrine. In addition to dilating agents administered prior to surgery, intracameral sympathomimetic drugs can improve mydriasis and pupil tension in many eyes.14 In the late 1990s, Joel K. Shugar, MD, described a combination of epinephrine and a local anesthetic that he named epi-Shugarcaine.4,15,16 This mixture is still used today.

Employ viscomydriasis. If the pupil is poorly dilated despite the use of pre- or intraoperatively administered drugs, viscomydriasis with a high-viscosity ophthalmic viscosurgical device (OVD) is the next step to attempt to dilate the pupil and enhance anterior chamber stability.17 Completely filling the anterior chamber with a high-viscosity OVD can help to achieve mechanical pupil dilation and stabilization.17-19 If it is the surgeon’s preference, the high-viscosity OVD can be injected only in the area of the unstable iris or iris prolapse. With this method, the OVD acts as a barrier, and the rest of the anterior chamber can be filled with another OVD with different characteristics.20,21

SURGICAL TECHNIQUE

Adjusting one’s surgical technique to the situation can help prevent or overcome intraoperative complications. For starters, some authors report improved anterior chamber stability using a bimanual microincision cataract surgery technique.22,23 When a clear corneal incision is used, the wound should be constructed longer than usual; however, under no circumstances should it be wider than needed for the instruments to pass through. If the incision is too large and outflow occurs around the phaco sleeve, iris prolapse can result.

The highest risk for iris prolapse is posed by the increase of intracameral pressure during hydrodissection, as there is no aspiration while fluid is injected into the anterior chamber in this maneuver. Forward movement of the iris-lens diaphragm when liquid is captured behind the lens can also trigger iris prolapse. When intracameral pressure rises,
iridocorneal angle is blocked, irrigation may be limited by obstruction. In this phase, the progression of the phaco probe (Figure 2). The use of an appropriate OVD along with proper phaco settings that include low irrigation and aspiration parameters can help avoid iris prolapse and progressive miosis.3

If iris prolapse occurs despite all these measures, injecting a high-viscosity OVD can reposition the tissue; however, in many cases this trick has limited use, as the OVD does not stay in place as it is supposed to.

In cases of repeated iris prolapse, iris hooks or a pupil expander should be placed before proceeding with phacoemulsification. As the positioning of four or five iris hooks is time-consuming and not always easy to accomplish in these difficult situations, iris expanders have become popular. It is important to remember: The earlier these devices are introduced, the easier they are to position and the better their effect.19,20,24,25

If these measures lead to no improvement of the situation, partial excision of the prolapsing iris tissue is the last resort.24

**CONCLUSION**

Many strategies and techniques are available for the management of IFIS and its complications preoperatively and at each stage of surgery. Ten guidelines for IFIS management are listed in the *Take-Home Message*.

An experienced surgeon will be able to rise to the challenge of dealing with IFIS using the techniques described here, but, as there is no gold standard, one tool alone stands out: communication.

Communication among all parties—the patient, the treating GP, the referring ophthalmologist, and the surgeon—remains the only reliable foundation on which to build one’s surgical planning. An informed surgeon can anticipate IFIS at an early stage when effective measures can still be taken. My advice for the cataract surgeon is simple: Talk, talk, talk.

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**TAKE-HOME MESSAGE**

1. Ensure you are aware of any existing medication(s) that the patient is taking. Communication among the referring ophthalmologist, GP, urologist, and surgeon is essential.
2. Conduct a thorough preoperative medical history.
3. Check the patient’s drug list again on the day of surgery.
4. Reduce intraocular pressure preoperatively.
5. Use a MICS technique and prepare long, watertight main and sideport incisions.
6. Use intraoperative epinephrine, and repeat as necessary.
7. Use a high-viscosity OVD, and repeat as necessary.
8. Perform restrained hydrodissection.
9. Carefully adjust fluidics: Keep the flow low.
10. Use iris hooks and/or a pupil expander.

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