Pearls for managing IFIS

by David F. Chang, M.D.

It is certainly a challenge to manage cataract surgery patients taking Flomax (tamsulosin hydrochloride, Boehringer Ingelheim GmbH, Germany), the most common alpha-1 antagonist used to treat obstructive lower urinary tract symptoms. It is important to realize that there is a wide range of intraoperative floppy iris syndrome (IFIS) severity between different individuals on systemic alpha blockers, and the most severe cases exhibit the classic triad of iris billowing, iris prolapse, and progressive intraoperative miosis.1 In my experience with non-specific alpha blockers such as Uroxatral (alfuzosin, Sanofi-Aventis, Paris), Hytrin (terazosin, Abbott Laboratories, Abbott Park, Ill.), or Cardura (doxazosin, Pfizer, New York), IFIS frequently will not occur. If it does, it will tend to be mild. Severe IFIS is much more likely in Flomax patients, and is predicted by very poor pre-op pupil dilation. This certainly indicates poor dilator muscle function. Another warning sign of severe IFIS is billowing of the iris during the initial intracameral anesthetic injection.

I am often asked what I do differently pre-op with Flomax patients. Our recent prospective study did not show any real benefit to stopping the drug.2 Although some physicians combine pre-op atropine sulfate with intracameral epinephrine, I am not convinced that this adds much compared to using intracameral epinephrine alone.3 It can’t hurt, but it can be confusing for some patients to comply with.

Intracameral epinephrine is a very effective pharmacologic strategy. I use a 1:3 or 1:4 dilution of epinephrine with plain BSS, and this is very well tolerated. Intracameral epinephrine will often further dilate a borderline pupil, but there are benefits even when the pupil diameter is unchanged. By increasing iris dilator muscle tone, alpha-agonists, such as epinephrine, will reduce the iris billowing and tendency for prolapse. Unfortunately, with severe IFIS cases, one can still be left with a small pupil and iris pro-
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lapse despite epinephrine use, so epinephrine alone is not 100% effective.

Sometimes, the pupil appears to have dilated reasonably well, but the iris billows and starts to constrict with the initiation of phaco. Perhaps the patient only now mentions that he had taken Flomax in the past. At this point, the placement of iris retractors is much more difficult because of the risk of hooking the capsulorhexis edge, which is no longer easily visualized. Intracameral epinephrine can be a wonderful “rescue” measure in this situation because it can stiffen the iris and sometimes re-dilate the pupil. It is readily available in every operating room (we use it in the BSS irrigation bottle) and takes just a moment to dilute.

Iris retractors

Iris retractors are invaluable for managing severe IFIS cases. I prefer reusable 4-0 Prolene retractors, which are available either from Katena Products (Denville, N.J.) or FCI Ophthalmics (Marshfield Hills, Mass.). I use the Oetting diamond configuration for retractor placement, in which one retractor is positioned through a separate tract behind and parallel to the phaco incision. This subincisional retractor will pull the iris down beneath and behind the phaco tip, which improves visibility and access to this area. The nasal retractor provides excellent access for placement of the chopper.

Unlike using epinephrine or Healon 5 (Advanced Medical Optics, AMO, Santa Ana, Calif.) strategies, iris retractors are 100% reliable in maintaining an adequate sized pupil that will not constrict during phaco. I would encourage their use if the patient has a very small pupil or if there are other comorbidities, such as pseudoexfoliation, loose zonules, a brunescent nucleus, a crowded anterior chamber, or any other situation where you want to be 100% sure that the iris will not constrict.

Many surgeons curtailed their use of 6-0 nylon iris retractors because of their cost, the added time to place and position them, the tenting up of the iris in front of the phaco tip (square configuration), and the tendency to over-stretch and tear the iris sphincter. These 6-0 Prolene retractors are much stiffer and therefore, are easier to manipulate. With minimal experience, you will become very fast at placing and removing them. Being thicker and made of Prolene, they can be autoclaved and reused. Finally, because the IFIS pupil is elastic and will stretch rather than tear, the pupil can be fully stretched without damage in most cases.

Reference
Diagnosing TASS

Differentiation from infectious endophthalmitis is key

by David F. Chang, M.D.

Toxic anterior segment syndrome (TASS) alarmed much of the cataract surgical community last year, when two large national outbreaks occurred. One of my own cases illustrates the difficulty in distinguishing TASS from infectious endophthalmitis.

The case involved a 50-year-old one-eyed healthy, black, male whose left eye was blind due to previous trauma. His right eye had a cataract for several years. Even though the patient lived elsewhere, because he was one-eyed, he sought me out in San Francisco for cataract surgery.

The patient had a dense posterior subcapsular cataract (his visual acuity was 20/100), and he was understandably nervous about the procedure. Fortunately, I performed an uncomplicated phacoemulsification under topical anesthesia.

On the first morning post-op, he had a visual acuity of 20/40 without correction, no pain, a clear cornea, and a relatively quiet conjunctiva. However, he also had 4+++ heavy cells, fibrin, and a tiny hypopyon. His IOP was fine (15 mm Hg). I dilated the pupil and the vitreous was clear with a good view of the fundus.

Although the patient was expecting to return home, I explained that we needed to stay for another day or two so we could carefully observe his heavy cells and fibrin. Fortunately, no other post-op patients had any problems that morning, and I recalled that he had been the first case of the day.

While he was dilating, I called the operating room nurse and asked if anything was handled differently that day. I think one thing you must consider with a potential case of TASS or infectious endophthalmitis is a break in operating room protocol. She said that, in fact, a service technician had been in the day before I operated to perform some maintenance on the phaco machine. Because of this, and because this patient had been the first case of the day, I suspected TASS and immediately began hourly topical prednisolone acetate and fluoroquinolone. One benefit of topical fourth-generation fluoroquinolones is that they penetrate deep into the anterior chamber. I asked the patient to return in 3 to 4 hours.

Meanwhile, I tried to reach the service technician to ask about the work he had done. He explained that, as he went from one location to another to service phaco machines, he carried around an empty BSS bottle, which he filled with tap water in order to test the pumps. This way, he didn’t have to open a new BSS bottle each time. Once I heard that he ran tap water through the machine pumps, I knew my patient must have a case of TASS.

Even if TASS is suspected, one must always consider the possibility of infectious endophthalmitis. If vitreous cells appear or increase over time, one must strongly suspect infection and refer the patient for a vitreous tap and antibiotic injection. With TASS, the inflammation does not get worse, while it will with an infection. By the second day post-op, there was no improvement or worsening of vision or inflammation in this young patient. By the third day post-op, there was a noticeable decrease in inflammation, and the hypopyon was gone.

It is remarkable how quickly
Advanced Techniques, Technology, and Therapeutics to Optimize Surgical Outcomes: A Video Roundtable

Consider a pars plana approach for cataract surgery

**Difficult case underscores need for new approaches**

*by Louis “Skip” Nichamin, M.D.*

I recently performed cataract surgery on my next door neighbor, a dear elderly lady. Although 87-years-old, she had no pre-op problems such as pseudoexfoliation, small pupil or unusually dense lens. I thought this would be a routine procedure; it quickly deteriorated into anything but that.

I began with a typical chop procedure, but it was not long after the initial cleavage of the nucleus that I realized we had a problem. Basically, I made one chop, rotated the lens, and noticed that there was a change in volume in the anterior chamber. This crucial tell-tale sign should alert the surgeon to the possibility of a problem. Any deepening in the anterior or posterior chamber is usually a sign of a capsular/zonular defect or compromise. I took the side port manipulator out of the eye, but not the phaco handpiece. In this particular eye, there was a 2 to 3+ nucleus, a normal-sized

Volume changes occurred in anterior chamber.

TASS clears up with aggressive topical steroid treatment.

**Tap water dangers**

Surgeons must caution the operating room staff to never use tap water to clean or flush cataract instruments.

Municipal water supplies frequently contain Gram-negative bacteria that can secrete a heat-stable endotoxin. When a phaco or irrigation/aspiration handpiece is irrigated with tap water, a small amount of endotoxin can contaminate the lumen. Although autoclaving will kill bacteria, the temperature will not be high enough to deactivate the endotoxin. The very first time a phaco or I/A handpiece gets used, endotoxins will be flushed into the eye. It potentially just takes a few parts per million of intraocular endotoxin to produce a severe inflammatory reaction that can mimic infectious endophthalmitis.

There are other reported cases where people have used tap water to fill the ultrasound bath. When a cannula or other irrigating instrument is placed in the ultrasound cleaner, endotoxin contamination of the lumen can occur. Sometimes this occurs when you have a new staff member, or when you do not have strict protocols in place. It is best to only use sterile water to rinse a cannula or handpiece to avoid the risk of contaminating the lumen with heat stable endotoxin. There are potentially many other cases of increased inflammation caused by this particular service technician’s economical practice of using tap water to test machine pumps.

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pupil, no pseudoxefoliation, no trauma, and literally, just five seconds into phacoemulsification, the lens was on its way south, into the vitreous.

A good point to consider stopping surgery is at the first sign of chamber deepening, which also is perhaps the hardest thing to do. We usually blithely keep going, and a small problem becomes a bigger problem. However, this does not mean immediate removal of the instrument from the eye, as abrupt shallowing may occur.

As such, the phaco tip remained in the eye. I quickly asked my assistant for the viscoelastic agent that was currently available and refilled the chamber, thus allowing the phaco probe to be removed without inducing hypotony. If you find this difficult to administer with your nondominant hand because your dominant hand is still holding the phaco or irrigation/aspiration instrument, have your assistant help you get the OVD in the eye.

We filled the chamber to maintain space and prevent hypotony, then we slowly exited the eye. The goal in this situation is to prevent posterior loss of the nucleus if you can. Even if the lens appeared stable in my patient, there was no way we were going to proceed with posterior chamber phacoemulsification. This is the point to decide if you will continue phacoemulsification in the anterior chamber or convert to a manual extraction.

The first priority is to sequester the lens and not lose it posteriorly. There are several ways to do that. I tend to use the viscoelastic cannula and try and get under the lens and bring it up to the anterior chamber. At this point, I use whatever OVD that is available in the surgical area. Once I get the lens into the anterior chamber, my preference is to create a barrier effect with Viscoat (Alcon Laboratories, Fort Worth, Texas), a dispersive OVD, both above and below the cataract. In this type of situation, it is not the time to worry about cost. We’ll commonly use two or three different viscoelastic agents for different purposes—a cohesive for space maintenance and a dispersive to tamponade the hyaloid face and also to protect the corneal endothelium.

In this particular situation, we were able to get the lens up into the anterior chamber and were able to continue phacoemulsification within the anterior chamber.

Consider a pars plana vitrectomy

There is a general shift among anterior segment surgeons to more frequently consider a controlled pars plana vitrectomy in difficult situations. Although this should not be performed in a cavalier fashion—without proper training and preparation—we do feel strongly that this is often the best choice for the patient.

Advantages of a pars plana vitrectomy include a limited but thorough vitreous cleanup and less likelihood of vitreous entering the wounds. This approach also affords access to remaining lens material, and it may help preserve capsular support.

In order to create the pars plana incision, I attempted to firm the eye up and made a good, solid in-and-out incision with an appropriate disposable blade. I took the conjunctiva down and measured back 3.2 mm behind the limbus. I
cauterized a little; you could go through the conjunctiva, but I suggest taking a moment and to clean that area.

We used an inferotemporal approach with this particular patient and a 19-gauge microvitreoretinal blade. We then made a straight perpendicular incision; this particular eye was a little soft—you must warn the patient that they may feel a little pressure at this juncture if topical anesthesia is being used, as in this case.

Another distinct advantage of the pars plana approach is that one can remove much of the remaining soft lens material at the same time, but you have to decrease your cutting rate and increase your vacuum rate. The infusion line was placed through the limbal side-port incision. We cleaned up our lens material, taking care to maintain the anterior capsulorhexis. When removing vitreous, one should have their cut rate as high as it can go (750 to 1,500 cpm for vitreous) with low to minimal vacuum settings.

We salvaged the capsule for sulcus placement of a three-piece foldable IOL.

There are many good reasons to inform patients of what happened. One reason is to make sure the patient is compliant with their post-op medications. If you help them understand that this was a challenging operation, strict compliance to post-op instructions can potentially make the difference, for example, in preventing late cystoid macular edema. Most often, patients will not take umbrage with you when they know you were honest with them.

**Post-op care**

If you do all the right things when performing a pars plana vitrectomy but one does not treat the patient properly post-op, one can still run into problems. If we treat the patient aggressively with proper medications, these complicated cases will do nearly as well as the routine patient—sometimes they do equally as well. My goal is to get the eye to a point where my associates are literally unable to distinguish the eye from an uncomplicated case, which of course will help facilitate their post-op management. However, I will indicate on the chart that the case was particularly challenging and request that the post-op anti-inflammatory medications be increased. We also make sure the patient is using brand PredForte (prednisolone acetate, Allergan, Irvine, Calif.), perhaps every hour on the day of surgery. It is also very important that the patient use an NSAID four times a day, to help prevent cystoid macular edema.

An increased risk of endophthalmitis should also be a concern in these patients, particularly if there has been loss of vitreous. To help minimize the risk of this catastrophic problem, it’s important to make sure all of your incisions are watertight at the end of the case, because vitreous may prolapse to the incisions if hypotony occurs, thus creating a conduit for organisms to enter the eye.

Because of this concern, we are aggressive with our use of a topical fluoroquinolone every hour on the first day of surgery. Patients typically use the corticosteroid and fluoroquinolone once every hour and the NSAID four times a day.

When the cataract surgeon faces complications such as the one I encountered in my next-door neighbor’s surgery, a controlled pars plana vitrectomy is often the best choice for the patient. It is important to note that there are wet labs to practice this far more efficient approach. Gradually, the vitreoretinal community is starting to accept this approach for the anterior segment surgeon. As a reminder, if you are going to perform this in a hospital setting, one ought to have their privileges expanded to cover a pars plana approach.
Use of NSAIDs in cataract surgery increasingly important
by Calvin W. Roberts, M.D.

As cataract surgeons, we traditionally have graded post-op success in terms of Snellen acuity—how well our patients see. Although Snellen acuity is an excellent measure of quantity of vision, it's not a great measure of quality of vision. All of us have had the experience of two patients—the patient who is 20/40 after cataract surgery and thinks his or her vision is great, and the 20/20 patient after cataract surgery who thinks their vision is poor.

We have traditionally thought the 20/20 patient was finicky and overcritical. I think it is possible that the patient with 20/40 may have great contrast sensitivity, and the 20/20 patient has poor contrast sensitivity. Many studies talk about the routine use of nonsteroidal anti-inflammatory drugs (NSAIDs) in all cataract surgery patients, not just high-risk ones. These NSAIDs decrease the amount of edema that occurs after cataract surgery, thereby increasing the quality of vision for all patients. This is especially critical in patients who will have a multifocal IOL implanted, as these IOLs are more taxing on the macula. We need the best functioning macula possible in our multifocal IOL patients. Macula malfunctioning during and after cataract surgery is a direct result of inflammation. Anything we can do to decrease inflammation after surgery or the duration that it lasts will impact our outcomes.

The use of nonsteroidals will improve visual acuity in all cataract surgery patients. I use Acular LS (ketorolac 0.4%, Allergan, Irvine, Calif.) four times a day, three days prior to surgery. I then continue NSAIDs for one month post-op. After that, we evaluate the macula with optical coherence tomography to measure if there is a change in macular thickness.

In combination with NSAIDS, I believe that one week of steroid use is probably adequate in the routine patient. For the high-risk patient, such as one with IFIS, we use steroids for longer periods of time.

If we analyze how we administer steroids and NSAIDs today compared with five years ago, I believe we now take an opposite approach. Many of us were administering our steroids for a month and our NSAIDs for a week or two. Now, we use NSAIDs for a month and steroidals less frequently. NSAIDs will help us improve visual quality and reduce edema in our surgical patients.