

Intraoperative Floppy Iris Syndrome (IFIS)

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Intraoperative Floppy Iris Syndrome or IFIS was first described in 2005 by Chang and Campbell, as a clinical triad observed during cataract surgery, that includes fluttering and billowing of the iris stroma, propensity for iris prolapse, and progressive intraoperative constriction of the pupil. IFIS increases the risk of serious complications during cataract surgery and makes the surgery much more difficult for the surgeon. It was first reported in association with the use of tamsulosin, which is an α_1 -adrenergic receptor (α_1 AR) antagonist used in the treatment of benign prostatic hypertrophy. Since then, many cataract surgeons from all over the world have reviewed their own patients taking this drug and found the same association during cataract surgery.

Clinical Signs of IFIS

Characteristically, the pupil dilates poorly in response to the routine preoperative mydriatics, or starts to constrict soon after the first incision; the iris tends to prolapse despite well-constructed incisions, and the iris stroma can be seen to be fluttering excessively in response to normal intraocular fluid currents during surgery. All routine attempts to dilate the pupil are usually ineffective and the pupil progressively constricts further, making the surgery more and more difficult.

Etiopathogenesis of IFIS

While the exact cause for this syndrome is still not clear, it has been postulated that the α_1 AR antagonists cause relaxation of the iris dilator muscle and cause disuse atrophy of this muscle in the long-term. It has been estimated that up to 2% of cataract surgery patients may be taking tamsulosin as cataract and BPH often co-exist in the same elderly population. In a postal survey of UK cataract surgeons, 53% surgeons had encountered the syndrome either retrospectively or prospectively in male and female patients on tamsulosin as well as other alpha-receptor antagonists. Although 68% of consultants had patients discontinue taking tamsulosin preoperatively, they reported no consistent benefit from this step. In a similar online survey of members of the American Society of Cataract and Refractive Surgery, 95% believed that tamsulosin makes cataract surgery more difficult and 77% believed it increases the risks of surgery. Commonly reported complications of IFIS were significant iris trauma and posterior capsule rupture.

Systemic medications associated with IFIS

Tamsulosin is a selective alpha-1A receptor subtype antagonist, while other non-specific α_1 receptor antagonists, including terazosin, doxazosin, and alfuzosin, have also been linked to IFIS; however, their relationship to the syndrome is not as definitive. Similarly, an anti-psychotic drug, risperidone has also been implicated to cause

IFIS. The various α_1 antagonist drugs are available in India under the following trade names:-

1. Dynapres / Urimax/ Veltam (Tamsulosin) by Dr. Reddy's labs, Cipla, and Intas
2. Doxacard (Doxazosin) by Cipla
3. Hytrin (Terazosin) by Abbott Labs
4. Flotral (Alfuzosin) by Ranbaxy
6. Risperidone (antipsychotic) by RPG life Sciences

Prospective evaluation of viscomydriasis using healon-5[®]) and flexible iris hooks.

We prospectively evaluated use of Healon-5[®]) and flexible iris hooks during phaco surgery in male patients taking Tamsulosin Hydrochloride for treatment of benign prostates hyperplasia (BPH) that predisposed them to IFIS. Cataract cases operated at the our centre during past 2 years with systemic history Tamsulosin (Dynapres, Dr Reddy's Laboratories; Urimax, Cipla, Veltam- Intas) were randomized as use of sodium hyaluronate 2.3%, (Healon-5[®]) to achieve intraoperative dilatation of small pupil in the one eye of all cases or use of flexible iris hooks to expand the pupil for fellow (contralateral) eyes of all cases. Results of this study suggested that out of 600 total cataract cases, 12 patients (2%) have had history of systemic intake of Tamsulosin. Viscomydriasis achieved by injection of (Healon-5[®]) provided satisfactory pupil dilatation to commence the surgery. However, a tendency of progressive constriction of pupil, was noted during the nuclear emulsification and irrigation/aspiration, which necessitated repeated injection of the Healon-5[®]. Posterior capsule rupture occurred during chopping of a dense cataract using high vacuum and high flow rate in one eye. The flexible iris hooks maintained a satisfactory pupil size the procedure. There was no intraoperative complication in any eye where these hooks were used for mechanical enlargement of pupil. Results of this pilot study suggests that operating IFIS cases using Healon 5[®] is more dependent upon fluidic parameters, surgical technique as well as surgeon's experience. The flexible iris hooks are helpful for mechanical pupil enlargement and for protection of the pupil margin in IFIS syndrome.

Management of IFIS

The management of this condition begins by anticipating the syndrome preoperatively by taking a careful history of drug use in all cataract surgery patients. If the pupil does not dilate preoperatively, atropine may be used, but is usually not very effective. It is important for surgeons to pay attention to achieve a proper wound construction, excessive hydrodissection and excessive injection of viscoelastic injection should be avoided.

Flexible Iris Retractors: It is better to anticipate the problem and place iris retractors at the outset, and this is one of the best methods for managing this condition. Multiple sphincterotomies and pupillary stretching is not only ineffective, it may actually increase

the propensity for iris prolapse and fluttering by decreasing the iris tone further. This distinguishes IFIS from other causes of small pupil, where pupillary stretching is effective as the pupillary margins are fibrotic unlike the floppy, atonic iris seen in IFIS.

Pupil expansion rings (e.g. PerfectPupil, Milvella Pty Ltd., Sydney, Australia) are helpful for pupil expansion and well as for protection of prolapse iris tissue to come in contact with phaco probe and/or during irrigation/aspiration.

Viscoadaptive Viscoelastic- sodium hyaluronate 2.3%, (Healon-5®): The use of viscoelastics like Healon-5®) has also been shown to be effective in dilating the pupil, though it needs to be replenished constantly. Slow motion phaco is certainly a help in minimizing intraocular fluid currents. The use of intracameral phenylephrine or epinephrine is useful in many cases, to dilate the pupil though iris prolapse still remains a challenge.

Conclusion

To conclude, IFIS is increasingly being recognized with the use of many kinds of systemic medications used to manage BPH. Recently, anti-psychotic drugs (e.g. risperidone) has also been implicated to cause IFIS. While these complications were observed by surgeons even before the discovery of this syndrome, now we can anticipate the problem by taking a careful medical history of using tamsulosin hydrochloride and other medications in all elderly patients and be prepared for managing patients identified to be at risk for having IFIS. The flexible iris hooks are helpful for mechanical pupil enlargement and for protection of the pupil margin in IFIS. It is also important for surgeons to pay attention to achieve a proper wound construction, excessive hydrodissection and excessive injection of ophthalmic viscoelastic agents should be avoided. A well-managed IFIS does not usually cause significant changes in postoperative outcomes.

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Congratulations

Heartfelt Congratulations to Dr. Namrata Sharma, Dr. Vishal Jhanji, Prof. J.S. Titiyal, Prof. R.B. Vajpayee for winning the best video titled, "Deep Anterior Lamellar Keratoplasty by Big Bubble Technique in Hurler-Scheie Syndrome" in the Refractive/Cornea category at Asia Pacific Association of Cataract & Refractive Surgeons held in Bangkok, Dec 2008.