SPONTANEOUS, LATE, IN-THE-BAG IOL DISLOCATION: ETIOLOGY, RISK FACTORS, PREVENTION, AND MANAGEMENT

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EXCHANGE FOR AN IRIS – CLAW IOL: RETROPUPILLAR FIXATION

Correction of in-the-bag IOL dislocation may be difficult, and requires certain special considerations for management. Decisions are based both on the clinical features of each individual case and on surgeon preference. Surgical options differ and may vary from IOL repositioning to IOL exchange, but the optimum approach for each case is as yet unclear.1-4 Data on management strategies of series with more than 20 cases of in-the-bag IOL dislocation is limited to four retrospective series.2-5

If the decision is taken to remove the entire IOL-capsule complex, the classic options for IOL replacement reported in the literature include angle-supported anterior chamber IOL implantation, scleral fixation of posterior chamber IOL and iris-suture of posterior chamber IOL.1-4

A review of the literature and an evidence-based review6 concluded that there is insufficient evidence to support the superiority of scleral or iris-supported posterior chamber lenses over open-loop anterior chamber lenses. There is no consensus on the indications, relative safety, or efficacy of these alternatives. Hayashi found that, after replacement with a scleral-sutured lens, corrected distance visual acuity (CDVA) did not improve markedly and the incidence of postoperative complications was high.5 Sutured posterior chamber IOLs are associated with similar rates of corneal edema, glaucoma, and cystoid macular edema as angle-supported anterior chamber IOLs. Furthermore, the potential complications of transscleral sutures include suture-knot exposure, endophthalmitis, intraocular hemorrhage, torsion or malposition of the IOL, and broken sutures causing repeat dislocation.7 In addition, the suturing technique is difficult, surgical time is lengthy, and intraocular manipulation is excessive, even with the use of the latest techniques. An alternative technique for scleral fixation, fibrin-glue-assisted sutureless posterior-chamber IOL implantation, may overcome some of the problems associated with the use of sutures, however, sclerotomies are still needed,
long-term follow-up would be required, and its use in the setting of in-the-bag IOL dislocation has only been reported in two cases. Applying McCannel’s retrievable iris suture technique to fix an IOL to peripheral iris reduces potential late complications of scleral sutures, including suture breakage and suture-related endophthalmitis; however, it is a time-consuming procedure and requires a considerable amount of intraocular manipulation.

In recent years, implantation of an iris claw IOL, either prepupilar or retropupillar fixated, has proved to be a successful method for the correction of aphakia in the absence of capsular support. Artisan/Verisyse aphakia IOLs (Ophtec BV; Advanced Medical Optics, Inc.), the latest version of iris-claw IOLs, are single-piece polymethyl methacrylate IOLs. The haptics have fine fissures to capture, using enclavation, a fold of midperipheral iris stroma, where the iris is virtually immobile, less vascularised and reactive and thus, the IOL neither interferes with physiological vascularisation nor does it affect mydriasis or angle structures. Because of its fixation characteristics, centering the lens over the pupil is dependent on the surgeon’s skill, rather than on the angle situation, and this feature makes the iris-claw IOL independent of anterior segment size. Iris claw IOLs avoid the anterior chamber angle, and this feature would be of benefit in the management of a condition in which a high proportion of eyes suffer from pseudoexfoliation and glaucoma. The implantation process takes only a few minutes in expert hands and it is a less invasive surgery, avoiding penetration through the sclera with sutures, which might also decrease the risk of posterior segment complications in the setting of previously vitrectomized eyes and myopia. Furthermore, eyes with in-the-bag IOL dislocation are at increased risk for retinal detachment when compared with out-of-the bag dislocation. This is another argument for choosing the minimally invasive technique for management. A retinal detachment rate of 6.3% has been found after the implantation of a transsclerally sutured posterior chamber IOL, while its incidence after iris-claw IOL implantation has been estimated in 0.8%. Retropupillar fixation offers optimum balance between rapid, easy, non-invasive surgery, the preservation of the anterior segment anatomy -avoiding the iridocorneal angle-, and the advantages of true posterior chamber implantation, which results in a deeper anterior chamber and greater distance to the corneal endothelium and has a lower intraoperative and postoperative risk profile than anterior fixation. The enclavation procedure in the posterior iris surface is easier than in the anterior one in aphakic eyes, particularly in vitrectomized cases. Differently from angle supported IOLs, scleral
sutured IOLs or iris sutured IOLs, recent series found no cases of secondary glaucoma or pigment dispersion glaucoma after retropupillar implantation of an iris claw IOL.\textsuperscript{11,12,18} Therefore, primary open angle and secondary glaucoma are not contraindications to posterior iris-claw IOL implantation.

Although some studies found no significant endothelial cell loss after prepupillar fixation of an iris claw IOL,\textsuperscript{13} cases of corneal decompensation were found in a recent series (1.7% de Silva).\textsuperscript{16} We found a significantly larger distance from endothelium to anterior IOL surface after retropupillar (3711.6 ± 543.4 µm) than after prepupillar fixation (2666 ± 540.7 µm) (p=0.0001) (Scheimpflug anterior segment analysis system)(unpublished personal results). Whether this 1 mm of difference has clinical advantages regarding endothelium cell density preservation should be evaluated in the long term.

Recently, we explored the alternative of retropupillar enclavation of iris claw IOLs as the surgical treatment in cases of aphakia without capsular support. Eight patients out of 30 cases of retropupillar iris claw implantation had in-the-bag IOL dislocation. Regarding results in vision, we found excellent outcomes in this short series, with all cases experiencing an improvement in CDVA, although in some of them final visual acuity was limited by previous comorbidities. Postoperative CDVA significantly improved after surgery (from 1.08 ± 1.09 logMAR preoperatively to 0.27 ± 0.32 log MAR postoperatively). A postoperative CDVA better than 20/40 was achieved in 75% of cases. This is comparable to the results in previous studies of secondary IOL implantation retropupillar iris-claw IOLs,\textsuperscript{11} anterior-fixated iris-claw IOLs,\textsuperscript{16} secondary open-loop anterior chamber IOLs (60% to 77% of eyes \textsuperscript{21}), secondary sulcus-sutured posterior chamber IOLs (53.8% to 77.8%\textsuperscript{22}), and secondary iris-sutured posterior chamber IOLs (60% to 67%\textsuperscript{23}). The incidence of complications was low and included one case of wound leak requiring resuture, one case of postoperative transient IOP rise and one case of asymptomatic pupil distorsion. There was no significant increase in IOP after surgery. Visual outcomes and the profile of complications in this short series compared favorably with findings in previous series of retropupillar iris claw implantation\textsuperscript{11,12,18} and are as good or better than those found after other alternatives of secondary IOL implants.\textsuperscript{21,22,23}

In summary, retropupillar iris claw implantation seems an excellent option for patients with in-the-bag dislocation in which a decision is made to exchange the IOL. It is a less invasive and time-consuming procedure when compared with scleral or iris-sutured
IOLs. The location of the IOL enclavated in the midperipheral iris, avoiding the iridocorneal angle, might offer an advantage in cases where there is a risk of glaucoma developing, such as pseudoexfoliation, the most common predisposing factor for in-the-bag IOL dislocation. A larger distance from the endothelium to anterior IOL surface could be of benefit in the long term in eyes which had already undergone previous surgeries. Further studies with a larger-scale series and a longer follow up are needed to confirm these conclusions.

REFERENCES


