Supplementary Online Content


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This supplementary material has been provided by the authors to give readers additional information about their work.
eMethods. Pars Plana Surgical Approach

Eyes with decreased vision due to clinically significant crystalline lens subluxation, severe lens instability, and/or subjective patient symptoms (ie, contact lens intolerance, refractive instability, monocular diplopia, or debilitating glare or halos) were eligible for iris suturing surgery. This approach was desirable in cases of moderate to severe lens subluxation, for which capsular support was deemed more tenuous and an anterior capsulorrhexis was not feasible (i.e., the subluxated lens edge uncovered greater than 25% of the dilated pupil or more than six contiguous clock hours of zonular dehiscence existed).\textsuperscript{3,4} With the pars plana approach, the anterior capsule of the crystalline lens was left intact initially. The subluxated crystalline lens and existing zonular network provided posterior support and intraoperative IOL stabilization before lens extraction.

After topical anesthesia and mild intravenous sedation, all surgeries were performed under retrobulbar anesthesia using marcaine (0.75%, Hospira) and lidocaine (2%, Hospira), mixed in equal volumes with hyaluronidase (Halozyme Therapeutics). Standard pharmacological dilation was avoided preoperatively in these cases because of the pupillary dilation achieved as a result of the retrobulbar injection, the necessity to facilitate iris capture of the IOL optic, and the maintenance of an adequate pupillary aperture for pars plana vitrectomy (PPV)/pars plana lensectomy (PPL) after iris suturing of the PCIOL. A 5% solution of povidone iodine was applied to the ocular surface, and a 10% solution of povidone iodine was used to prepare the periorbital skin. The patient was then draped in the usual sterile fashion.

After placing a lid speculum, a standard, small-incision 2.8mm main corneal wound was made into the anterior chamber at the 9 o’clock position regardless of laterality (nasally for left eyes and temporally for right eyes). A paracentesis was made at the 3 o’clock position. Vitreous was removed with an anterior vitrectomy, if present. An ophthalmic viscosurgical device (OVD) was instilled into the anterior chamber (Healon GV, Abbott Medical Optics).
Iris suturing of the PCIOL was identical to the procedure previously described. A small amount of cohesive OVD was utilized to create surgical space in the ciliary sulcus and push the capsular bag posteriorly. Depending on the size of the pupil after the retrobulbar block, an acetylcholine chloride intraocular solution (Miochol®, Bausch and Lomb) was instilled into the anterior chamber to constrict the pupil to a size smaller than the biconvex optic diameter (6.5 mm) of the 3-piece IOL (Alcon AcrySof MA50BM IOL, Alcon Inc). We selected this type of 3-piece IOL because of the 10-degree posterior angulation of its polymethyl methacrylate (PMMA) haptics, which are less likely to induce postoperative iris trauma or pupillary block. The corneal wound was enlarged to a size large enough to accommodate the folded acrylic IOL optic (approximately 3.5mm).

The IOL was then folded across its center with a lens folding forceps in a mustache-style fashion (Fig 1). The IOL was inserted into the anterior chamber with a lens inserter forceps through the enlarged corneal wound. The PMMA haptics were allowed to open behind the iris and settle into the ciliary sulcus in a reverse S configuration with the lens and existing zonular network providing posterior support and stabilization for the IOL (Fig 2). Simultaneously, the IOL optic attained iris capture while being supported posteriorly with a Barraquer sweep. The Barraquer sweep continuously supported the optic anteriorly and helped visualize each PMMA haptic posteriorly as they unfolded behind the iris.

Iris suturing of the IOL was accomplished using a modified McCannel technique. One end of a 10-0 polypropylene suture (Prolene; Ethicon) on a spatulated needle (CTC-6; Ethicon) was passed through clear cornea, through the mid-peripheral iris, and then underneath the PMMA haptic of the 3-piece IOL that was positioned posterior to the iris at the 6- or 12-o’clock position (Fig 3). The pass was completed back through the iris and clear cornea on the opposite side. The needle was removed from the suture. A paracentesis was created at a position adjacent to the location where the PMMA haptic had been fixated. Using a Lester hook, each end of the polypropylene suture was drawn from the anterior chamber external to the eye through the paracentesis (Fig 4). The 10.0 polypropylene sutures were tied securely together using at least four throws, and the iris was allowed to fall back into its normal anatomic
position. A similar procedure was performed 180 degrees away through an additional paracentesis (Figs 5 and 6).

Once the IOL had been secured to the iris, a standard 3-port PPV was initiated using a 23-gauge system with incisions 3.5mm posterior to the limbus (Fig 7). A PPL was completed with the vitrectomy cutter or the phacofragmentation probe (Fig 8). This decision was largely determined by the occasional failure of the vitrectomy cutter to remove nuclear material in more mature lenses. After removal of the lens material, the remaining capsule was drawn into the optical axis with a forceps and removed with the vitrectomy cutter. A standard core vitrectomy was then performed removing any loose lens fragments from the vitreous cavity and ensuring no residual vitreous was adherent to the iris sutured PCIOL. Scleral depression was conducted in a 360-degree fashion to identify any retinal tears or breaks.

After the PPV, a Sinskey hook was used to push the optic of the IOL behind the iris. An anterior vitrectomy was performed in select cases where vitreous prolapsed into the anterior chamber. The iris was manipulated to produce a round pupil using a Sinskey hook. The residual Healon was removed using an irrigation-aspiration unit or a Simcoe cannula. Additional acetylcholine chloride intraocular solution was instilled to ensure the iris completely covered the IOL optic. The corneal wounds were sutured with 10-0 polyglactin 910 (Vicryl; Ethicon) sutures. The vitrectomy ports were removed from the sclera. The sclerotomy sites and conjunctiva were closed with 8.0 polyglactin 910 sutures if any wound leakage was present. The incisions were tested for leakage with Weck-Cel sponges (Beaver Visitec). Subconjunctival injections of steroids and antibiotics were administered. The lid speculum was removed, and an eye patch and shield were placed over the operative eye.
**eFigure 1.** Folding of the IOL. The intraocular lens is folded across its center with a lens folding forceps in a mustache-style fashion.
eFigure 2. Insertion of the IOL Haptics Behind the Iris. The polymethyl methacrylate haptics of the IOL are allowed to open behind the iris and settle into the ciliary sulcus in a reverse-S configuration.
eFigure 3. First Suture Pass of Iris Fixation of the IOL. One end of a 10-0 polypropylene suture (Prolene; Ethicon) on a spatulated needle (CTC-6; Ethicon) is passed through clear cornea, through the mid-peripheral iris, and then underneath the haptic of the intraocular lens that is positioned posterior to the iris.
**eFigure 4.** Externalization of the Polypropylene Suture. Using a Lester hook, each end of the 10.0 polypropylene suture is drawn from the anterior chamber external to the eye through the paracentesis.
eFigure 5. Second Suture Pass of Iris Fixation of the IOL. A similar procedure is performed 180 degrees away through an additional paracentesis while the intraocular lens is continually supported with a Barraquer sweep.
**eFigure 6.** IOL Placement Before PPV/PPL. The pars plana surgical approach allows placement of the intraocular lens while the crystalline lens initially remains in its native position (cross-sectional view).
**eFigure 7.** PPV/PPL After Iris Suturing of the IOL. Once the intraocular lens is secured to the iris, a standard 3-port PPV is initiated using a 23-gauge system with incisions 3.5mm posterior to the limbus.
**eFigure 8.** Completion of the PPV/PPL After Iris Suturing of the IOL. A PPL is completed with the vitrectomy cutter or the phacofragmentation probe (cross-sectional view).