

Tips and Tricks for Secondary Lens Placement

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Although cataract surgeons insert the majority of intraocular lens (IOL) implants, vitreoretinal surgeons are often called upon when things go awry. Situations may include complicated cataract surgery, trauma, and zonular instability due to conditions such as pseudoexfoliation, Marfan's syndrome, and homocysteinuria.

Numerous methods exist for the placement of secondary IOL implants. Here, we review some tips and tricks for secondary lens implantation. We also offer considerations as to when each method may be employed. Being comfortable with a variety of surgical approaches is advantageous because this will allow the surgeon to tailor the procedure to each individual situation.

IRIS-FIXATED POSTERIOR CHAMBER IOL IMPLANTS

Iris-haptic fixation is an ingenious technique first described by McCannel in 1976.¹ To summarize the technique (Figure 1), a lens is placed with the haptics in the ciliary sulcus and optic captured by the pupil. A curved CTC needle with 10-0 prolene suture is passed through cornea, under the haptic by entering and exiting the iris on either side of the haptic, and out through the cornea. The suture ends are externalized through a paracentesis and a knot is tied and trimmed, fixating the haptic to the iris. The procedure is repeated for the remaining haptic.

Occasionally, particularly with dark irides, the location of the haptics is difficult to visualize. If the optic is gently lifted anteriorly, either through a paracentesis or sclerotomy in cases with concurrent vitrectomy, the location of the haptic will be highlighted behind the iris. Incorporating only a small amount of peripheral iris will prevent "bunching" of the iris after the procedure and allow for good pupil movement.

Being comfortable with a variety of surgical approaches [for secondary IOL implantation] is advantageous because this will allow the surgeon to tailor the procedure to each individual situation.

Grasping the prolene suture with a Sinsky hook to externalize it through the paracentesis can be a tricky maneuver, as the suture may slip off the instrument. Other instruments, such as a Kuglin hook, are better at retaining the suture but occasionally require a larger paracentesis. Using a 25-gauge retinal forcep makes this step simple. Another good method utilizes a Siepser slipknot² so that the iris need not be pulled to the paracentesis wound for tying.

SCLERAL-FIXATED POSTERIOR CHAMBER IOL IMPLANTS

Docking a prolene needle with a 27-gauge hollow-bore needle in the vitreous cavity is a clever method to pass sutures through the pars plana. Traditionally the corneal prolene suture pass is performed through a paracentesis; however, inadvertently piercing a portion of the corneal wound with the sharp needle can create a false passage, prohibiting the ability to tighten the knot. Using a 25-gauge trocar in place of a paracentesis can eliminate this issue.

One interesting technique involves creating a scleral flap without a conjunctival dissection. In this method, a limbal groove is created. Next, a crescent knife is used to dissect a partial-thickness scleral flap posteriorly. Suture-docking with the prolene needle can be performed by inserting a 27-gauge needle transconjuncti-

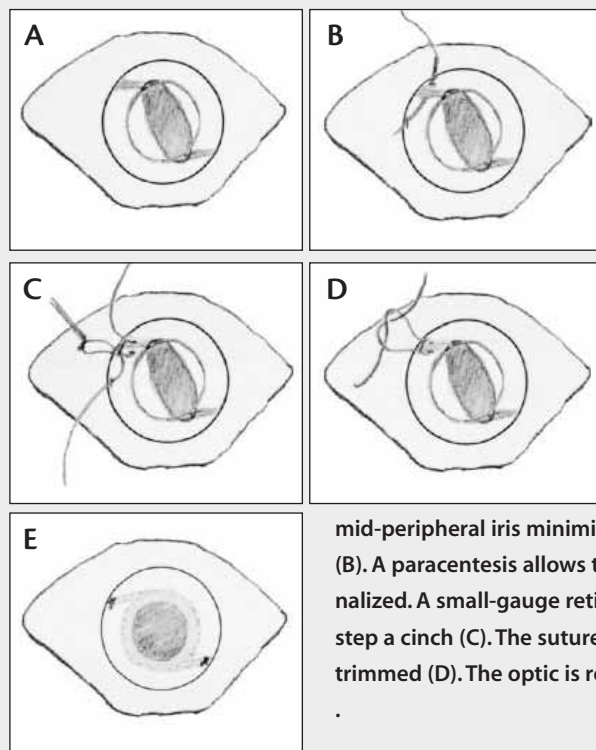


Figure 1. Iris fixation. Optic capture is achieved with the haptics in the sulcus and the optic anterior to the constricted pupil (A). The CTC needle with 9-0 prolene is passed underneath the haptic, both in and out through cornea and iris. Incorporating only a small bite of

mid-peripheral iris minimizes pupillary distortion (B). A paracentesis allows the sutures to be externalized. A small-gauge retinal forceps makes this step a cinch (C). The suture is tied and the knot trimmed (D). The optic is replaced behind the iris (E).

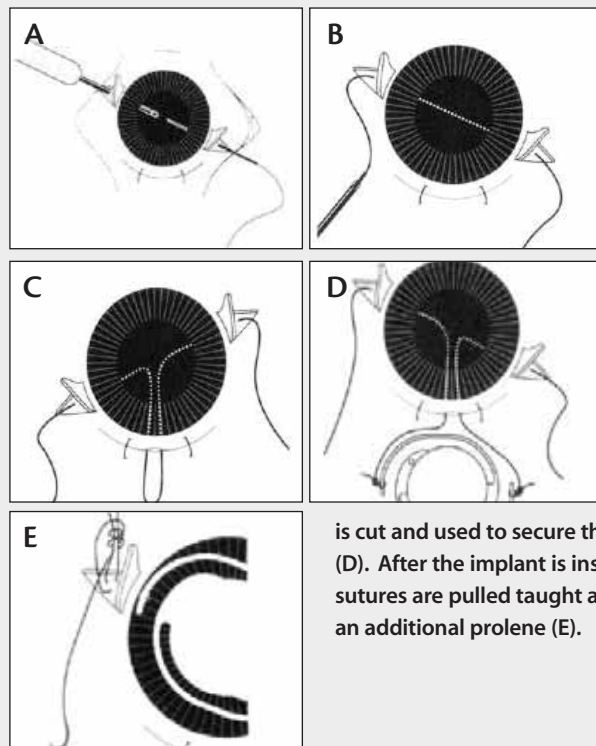


Figure 2. Scleral fixation. After scleral flaps are created, a hollow 27-gauge needle is inserted and used to "dock" a straight needle with 9-0 prolene (A). The prolene is passed safely through the opposite flap without necessitating a blind pass (B). The prolene is externalized through the keratome wound (C). The externalized prolene

is cut and used to secure the intraocular lens implant (D). After the implant is inserted into the sulcus, the sutures are pulled taut and tied to the sclera with an additional prolene (E).

vally through the scleral flap, and into the vitreous cavity for docking. After extracting the prolene needle transconjunctivally, the surgeon needs only to grasp the suture from the partial-thickness scleral flap. One pass is made in this manner inside the haptic and one outside the haptic; the two ends are tied fixating the haptic to the sclera.

ANTERIOR CHAMBER IOL IMPLANTS

The anterior chamber IOL, although much maligned in the past, has greatly improved in design.³ The vaulted architecture reduces iris chafing and is less likely to result in inflammation and cystoid macular edema. As opposed to previous iris-claw designs, modern anterior chamber IOL footplates commonly rest on the scleral spur, causing far fewer postoperative issues. The lens glide and a dollop of viscoelastic can help facilitate placement in the angle. The pupil should be round; a peaked pupil should warn the surgeon to recheck footplate placement.

Wound construction is an important part of anterior chamber IOL placement. Careful scleral tunnel construction can minimize postoperative astigmatism and the number of sutures required for wound closure (Figures 3 and 4). It can also allow rapid oil removal in aphakic eyes that do not require concomitant mem-

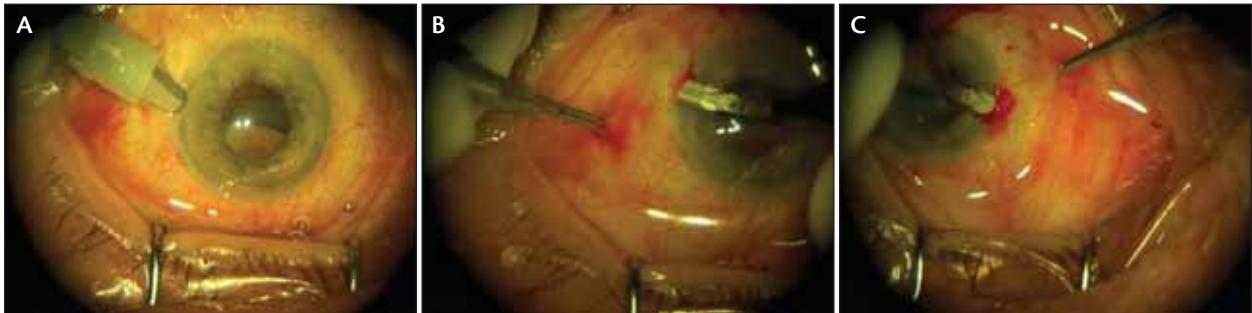


Figure 3. Posterior scleral tunnels. Posterior scleral tunnels can eliminate the need to open the conjunctiva with scleral fixation. An initial limbal groove is created (A). The crescent knife is used to create a tunnel posteriorly through partial-thickness sclera (B). A similar tunnel is made 180° away, and the remainder of the surgery is similar to traditional scleral fixation (C).



Figure 4. Trocar/cannula assistance. The 25-gauge cannula can be used to avoid creating false passages through the cornea. The trocar/cannula is inserted at the limbus into the anterior chamber (A). The straight needle with 9-0 prolene is passed through the posterior scleral flap (B). Needle capture is facilitated by the 25-gauge cannula for easy access. The remainder of the surgery is similar to traditional scleral IOL fixation (C).

brane peeling. For example, manual small-incision cataract surgery is a technique pioneered in India that allows for sutureless extracapsular cataract extraction—without phacoemulsification—due to the “frown”-shaped wound construction (Figure 5).⁴

This frown incision can also be used in anterior chamber IOL placement. In aphakic eyes that do not require membrane peeling, the oil can be easily “burped” out of the wound without necessitating a full three-port vitrectomy; only an infusion cannula is needed. Whether vitrectomy is performed, after anterior chamber IOL placement, this stable wound can be closed with a minimum number of sutures, often with a single figure-of-eight pass.

CONCLUSIONS

Possessing a number of approaches in the surgical armamentarium is important for retina specialists to adapt to unusual situations and tailor the procedure to the patient. Placement of secondary IOLs, whether they are scleral-fixated, iris-fixated, or anterior chamber IOLs, is a perfect example. Countless variations have been described, and each retina surgeon must find tips and tricks that work best in their own hands. ■

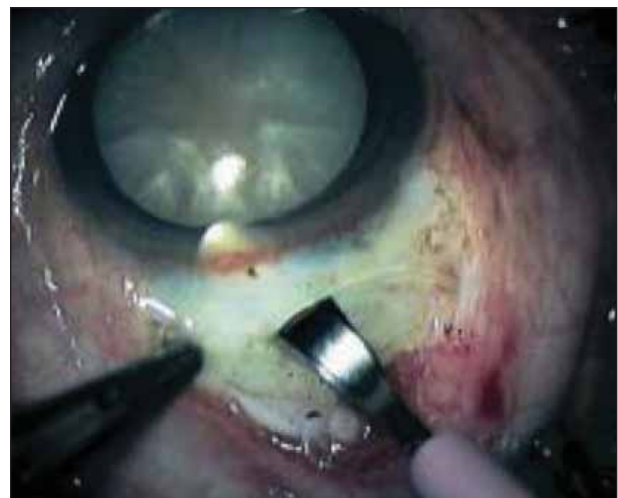
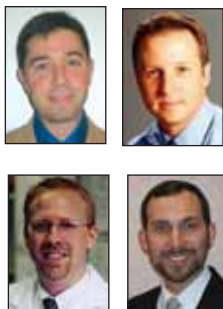


Figure 5. Anterior chamber IOL implant. After an initial “frown” groove incision is performed, the crescent knife is used to dissect a scleral tunnel. The “frown” incision, developed for sutureless manual small incision extracapsular cataract surgery, is helpful in anterior chamber IOL placement to minimize astigmatism and the number of sutures required for closure.

Figure 5 adapted with permission from Haidipurkar SS, Shikri HT, Gokhale V. Wound construction in manual small incision cataract surgery. *Indian J Ophthalmol*. 2008;57(1):9-13. Copyright © All India Ophthalmological Society.

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Nevanac® (nepafenac ophthalmic suspension) 0.1%

INDICATIONS AND USAGE

NEVANAC® ophthalmic suspension is indicated for the treatment of pain and inflammation associated with cataract surgery.

CONTRAINDICATIONS

NEVANAC® ophthalmic suspension is contraindicated in patients with previously demonstrated hypersensitivity to any of the ingredients in the formulation or to other NSAIDs.

WARNINGS

There is the potential for cross-sensitivity to acetylsalicylic acid, phenylacetic acid derivatives, and other nonsteroidal anti-inflammatory agents. Therefore, caution should be used when treating individuals who have previously exhibited sensitivities to these drugs.

With some nonsteroidal anti-inflammatory drugs including NEVANAC®, there exists the potential for increased bleeding time due to interference with thrombocyte aggregation. There have been reports that ocularly applied nonsteroidal anti-inflammatory drugs may cause increased bleeding of ocular tissues (including hyphemas) in conjunction with ocular surgery.

PRECAUTIONS

General: Topical nonsteroidal anti-inflammatory drugs (NSAIDs) including NEVANAC®, may slow or delay healing. Topical corticosteroids are also known to slow or delay healing. Concomitant use of topical NSAIDs and topical steroids may increase the potential for healing problems.

Use of topical NSAIDs may result in keratitis. In some susceptible patients, continued use of topical NSAIDs may result in epithelial breakdown, corneal thinning, corneal erosion, corneal ulceration or corneal perforation. These events may be sight threatening. Patients with evidence of corneal epithelial breakdown should immediately discontinue use of topical NSAIDs including NEVANAC® and should be closely monitored for corneal health.

Postmarketing experience with topical NSAIDs suggests that patients with complicated ocular surgeries, corneal denervation, corneal epithelial defects, diabetes mellitus, ocular surface diseases (e.g., dry eye syndrome), rheumatoid arthritis, or repeat ocular surgeries within a short period of time may be at increased risk for corneal adverse events which may become sight threatening. Topical NSAIDs should be used with caution in these patients.

Postmarketing experience with topical NSAIDs also suggests that use more than 1 day prior to surgery or use beyond 14 days post surgery may increase patient risk for occurrence and severity of corneal adverse events.

It is recommended that NEVANAC® ophthalmic suspension be used with caution in patients with known bleeding tendencies or who are receiving other medications which may prolong bleeding time.

Information for Patients: NEVANAC® ophthalmic suspension should not be administered while wearing contact lenses.

Carcinogenesis, Mutagenesis, Impairment of Fertility: Nepafenac has not been evaluated in long-term carcinogenicity studies. Increased chromosomal aberrations were observed in Chinese hamster ovary cells exposed *in vitro* to nepafenac suspension. Nepafenac was not mutagenic in the Ames assay or in the mouse lymphoma forward mutation assay. Oral doses up to 5,000 mg/kg did not result in an increase in the formation of micronucleated polychromatic erythrocytes *in vivo* in the mouse micronucleus assay in the bone marrow of mice.

Nepafenac did not impair fertility when administered orally to male and female rats at 3 mg/kg (approximately 90 and 380 times the plasma exposure to the parent drug, nepafenac, and the active metabolite, amfenac, respectively, at the recommended human topical ophthalmic dose).

Pregnancy: Teratogenic Effects.

Pregnancy Category C: Reproduction studies performed with nepafenac in rabbits and rats at oral doses up to 10 mg/kg/day have revealed no evidence of teratogenicity due to nepafenac, despite the induction of maternal toxicity. At this dose, the animal plasma exposure to nepafenac and amfenac was approximately 260 and 2400 times human plasma exposure at the recommended human topical ophthalmic dose for rats and 80 and 680 times human plasma exposure for rabbits, respectively. In rats, maternally toxic doses ≥ 10 mg/kg were associated with dystocia, increased postimplantation loss, reduced fetal weights and growth, and reduced fetal survival.

Nepafenac has been shown to cross the placental barrier in rats. There are no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, NEVANAC® should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Non-teratogenic Effects: Because of the known effects of prostaglandin biosynthesis inhibiting drugs on the fetal cardiovascular system (closure of the ductus arteriosus), the use of NEVANAC® ophthalmic suspension during late pregnancy should be avoided.

Nursing Mothers: NEVANAC® ophthalmic suspension is excreted in the milk of pregnant rats. It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when NEVANAC® ophthalmic suspension is administered to a nursing woman.

Pediatric Use: The safety and effectiveness of NEVANAC® in pediatric patients below the age of 10 years have not been established.

Geriatric Use: No overall differences in safety and effectiveness have been observed between elderly and younger patients.

ADVERSE REACTIONS

In controlled clinical studies, the most frequently reported ocular adverse events following cataract surgery were capsular opacity, decreased visual acuity, foreign body sensation, increased intraocular pressure, and sticky sensation. These events occurred in approximately 5 to 10% of patients.

Other ocular adverse events occurring at an incidence of approximately 1 to 5% included conjunctival edema, corneal edema, dry eye, lid margin crusting, ocular discomfort, ocular hyperemia, ocular pain, ocular pruritus, photophobia, tearing and vitreous detachment.

Some of these events may be the consequence of the cataract surgical procedure.

Nonocular adverse events reported at an incidence of 1 to 4% included headache, hypertension, nausea/vomiting, and sinusitis.

DOSE AND ADMINISTRATION

Shake well before use. One drop of NEVANAC® ophthalmic suspension should be applied to the affected eye(s) three-times-daily beginning 1 day prior to cataract surgery, continued on the day of surgery and through the first 2 weeks of the postoperative period.

NEVANAC® ophthalmic suspension may be administered in conjunction with other topical ophthalmic medications such as beta-blockers, carbonic anhydrase inhibitors, alpha-agonists, cycloplegics, and mydriatics.

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U.S. Patent No: 5,475,034

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