Anterior capsule staining using micronized triamcinolone in the absence of red reflex

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We describe a technique to stain the anterior lens capsule with micronized triamcinolone to perform a continuous curvilinear capsulorhexis (CCC) during phacoemulsification in the absence of a red reflex due to vitreous hemorrhage. After a self-sealing clear corneal tunnel incision is performed using a 2.75 mm blade, a dispersive ophthalmic viscosurgical device (OVD) is injected to protect the iridocorneal angle. An air bubble as large as possible is injected into the center of the anterior chamber, and a small amount of micronized triamcinolone is then injected as needed to stain the anterior lens capsule. The OVD injection permits the removal of excessive triamcinolone and protects the corneal endothelium from damage during phacoemulsification. A capsulorhexis forceps is used to perform the CCC.

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Online Video

Performing a continuous curvilinear capsulorhexis (CCC) in cataractous eyes without a red reflex is challenging because it is difficult to distinguish the anterior capsule from the underlying cortex.[1] Poor visualization of the capsule can result in an inadequate CCC; a high risk for radial tears toward or beyond the lens equator; and complications such as zonule and posterior capsule tears, vitreous loss, and intraocular lens (IOL) decentration.[1,2]

One method to facilitate the CCC is staining the anterior capsule to enhance the contrast between it and the underlying cortex, as in the case of white or hypermature cataract, using staining agents such as trypan blue 0.1%,[3] indocyanine green 0.5% (ICG),[4] gentian violet 0.001%,[5] fluorescein 2.0%,[6,7] or autologous blood.[8] We studied the safety and efficacy of using micronized triamcinolone to stain the anterior capsule during phacoemulsification in eyes without a red reflex because of vitreous hemorrhage.

SURGICAL TECHNIQUE

Starting 3 days before surgery, topical ofloxacin eyedrops 0.3% are used 3 times daily. The surgical technique, summarized in Figure 1, includes full asepsis, perioperative cleaning of the conjunctival sac with povidone–iodine 5%, topical anesthesia using oxybuprocaine 1%, and pupil dilation larger than 3.0 mm.

A self-sealing clear corneal tunnel incision is performed using a 2.75 mm blade on the astigmatism axis shown by keratometry. A dispersive ophthalmic viscosurgical device (OVD) is injected to protect the iridocorneal angle from direct contact with the triamcinolone powder.

Anterior capsule staining using micronized triamcinolone (Vitreal S, SOOFT, Montegiorgio, Italy) is performed under air to prevent dispersion of the triamcinolone into the anterior chamber and direct endothelial corticosteroid contact. An air bubble that is as large as possible is injected into the center of the anterior chamber, and then a small amount of triamcinolone is injected as needed to stain the anterior lens capsule and prevent its diffusion at the iridocorneal angle (Figure 1, *A*). The OVD injection permits removal of excessive triamcinolone and protects the corneal endothelium from

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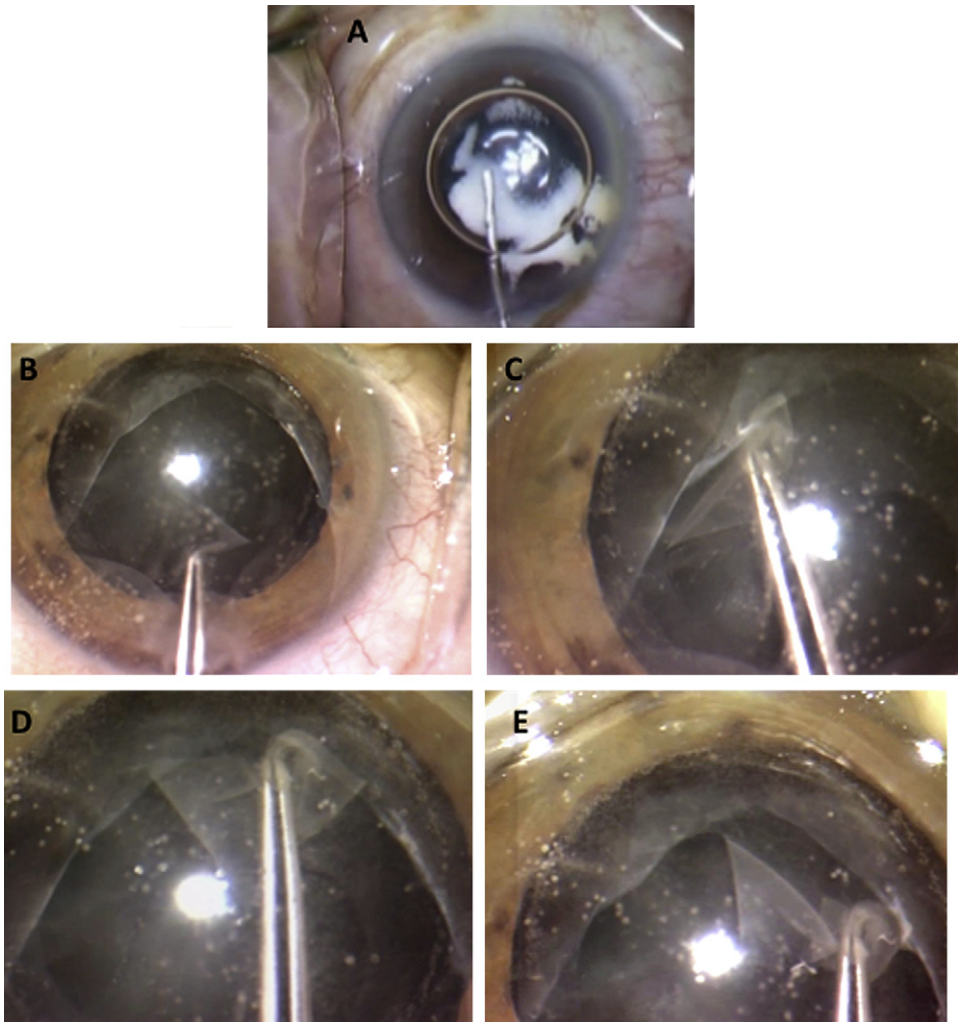

Figure 1. *A*: Injection of triamcinolone under air bubble in anterior chamber. *B* to *E*: Triamcinolone-assisted anterior CCC.

damage secondary to phacoemulsification. Using a capsulorhexis forceps, a CCC is created (Figure 1, *B* to *E*; Video, available at http://jcrsjournal.org). Phacoemulsification is performed using a divide-and-conquer technique, followed by in-the-bag implantation of a hydrophilic acrylic IOL. After cataract extraction, a 23-gauge pars plana vitrectomy is performed.

Postoperatively, topical ofloxacin and corticosteroid eyedrops are used 5 times daily with short-term mydriatic drops twice a day for 15 days; then, corticosteroid eyedrops alone are used 3 times daily for 15 days. Postoperative anterior chamber flare is staged at the slitlamp examination, as previously described.[9]

Results

Triamcinolone-assisted CCC was performed in 9 patients. Patient characteristics and surgical outcomes are summarized in Table 1. The CCC was uneventful in all cases, and the surgeons considered the use of triamcinolone a concrete tool to perform CCC in eyes without red reflexes due to vitreous hemorrhages.

On the first postoperative day, small Descemet membrane folds and 2+ anterior chamber flare were seen in all patients. In 1 patient, some triamcinolone granules were present in the inferior sector of the anterior chamber. In all patients, the intraocular pressure (IOP) was less than 18 mm Hg ($P=.11$) and the IOLs appeared completely clear.

After 1 week, no anterior chamber cells and flare were seen and the IOP was not significantly increased from baseline ($P=.47$). Triamcinolone granules were not seen in the anterior chamber of any patient.

One month postoperatively, the anterior segment was clear in all patients and IOP had not changed significantly ($P=.37$). After 3 months, the IOP was not significantly different than at baseline ($P=.27$); the endothelial cell count was significantly less than at baseline ($P=.04$), with a mean reduction of 13%.

During follow-up, no patient experienced endophthalmitis, retinal detachment, or episodes of ocular