

# Management of Angle-supported Intraocular Lens and Iridectomy in Descemet-Stripping Endothelial Keratoplasty

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**Problem:** Effective tamponade of a Descemet-stripping endothelial keratoplasty graft with a gas bubble requires that there is no route for the bubble to escape into the posterior chamber.

**Solution:** Exchange the angle-supported anterior-chamber intraocular lens (IOL) for an iris-enclaved Artisan IOL and position the IOL haptics over the peripheral iridectomy to occlude it to the extent that no gas can pass.

**Key Words:** Descemet-stripping endothelial keratoplasty, Artisan, Verisyse, angle-supported intraocular lens, peripheral iridectomy

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## TECHNIQUES

Anterior-chamber intraocular lenses (ACIOLs) implanted at the time of complicated cataract surgery are a known risk factor for the development of pseudophakic bullous keratopathy.<sup>1</sup> Conventional treatment of these cases has been penetrating keratoplasty (PK), but Descemet-stripping endothelial keratoplasty (DSEK) is rapidly becoming the procedure of choice. DSEK, described by Melles et al,<sup>2</sup> uses an air bubble in the anterior chamber (AC) to compress a lamellar graft against the recipient stroma. Although this tamponade is easy to achieve when there is an intact posterior capsule and/or a posterior chamber (PC) lens, it may be difficult or impossible when there is aphakia or an angle-supported IOL because of the tendency of the gas to track back into the posterior chamber.

The Artisan lens (Ophtec, Groningen, The Netherlands) has been used successfully in PK,<sup>3,4</sup> and we describe our technique with this lens in DSEK, overcoming the problems of a nonintact lens–iris diaphragm.

## SURGICAL METHOD

Figure 1 shows the operative sequence. We prefer a short scleral tunnel approach because this helps to maintain the AC during graft insertion. Initially, the ACIOL is explanted and replaced with an Artisan lens. The Artisan is manipulated so that the haptics are aligned with the peripheral iridectomy (PI). Enclavation is performed with the standard enclavation needle

(Ophtec) through separate preformed paracenteses. Here the left haptics were initially enclaved, followed by the haptics overlying the PI. The latter enclavation was done in 2 stages: First, the proximal edge of the PI is enclaved, and then the lens rotated a little so that the distal edge of the PI can also be brought up into the haptics. This approach reduces the size of the PI sufficiently to prevent the subsequently injected air bubble from tracking back into the posterior chamber, while still leaving an adequate path for aqueous to flow. Finally, Descemet stripping is performed with a reverse Sinsky hook, and the graft is introduced and positioned. Gas is injected to fill the AC, and in previously vitrectomized eyes, this will typically be accompanied by some posterior bowing of the lens–iris diaphragm. However, because the Artisan lens moves with the iris, the pupil remains effectively occluded. After 10 minutes of firm tamponade, about half of the gas is released, leaving the AC half full of bubble.

Both of the cases that we have performed thus far with this technique have had good outcomes, with successful primary attachment of the graft.

## DISCUSSION

One alternative method, put forward by Groat et al<sup>5</sup> to address the problem of the nonintact lens–iris diaphragm, is to temporarily suture the pupil while the graft is tamponaded with a bubble on the operating table, with subsequent release of the pupil suture. Although this technique seems to be effective, it does not allow for ready “re-bubbling” should the graft fail to become primarily attached.

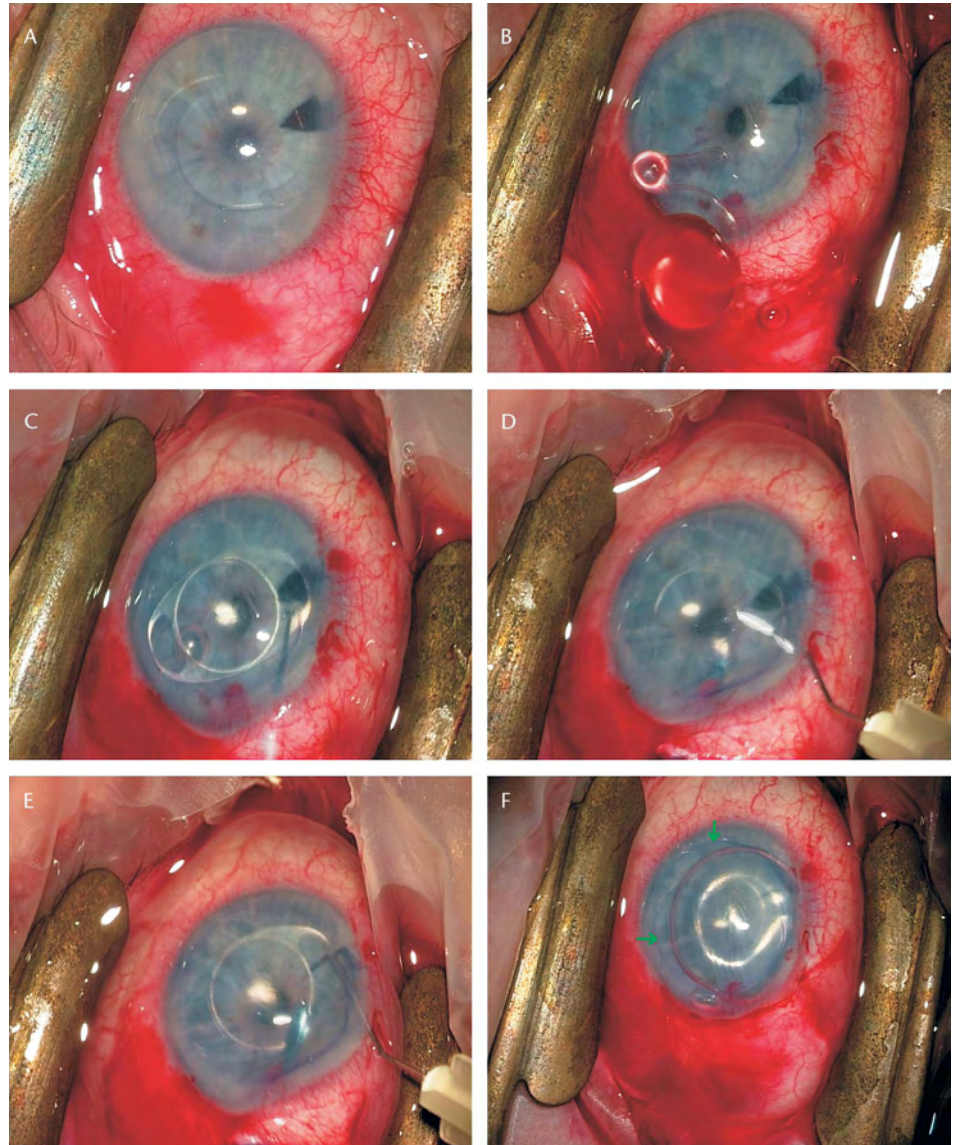
When DSEK is planned for an eye with an ACIOL, the ACIOL could be exchanged for a PCIOL. A conventional PCIOL can be fixated either with transscleral sutures<sup>6</sup> or iris fixation sutures,<sup>7</sup> or alternatively, an Artisan IOL can be reversed and enclaved onto the posterior iris surface.<sup>8</sup>

Transscleral suturing can be complicated by intravitreal hemorrhage, retinal detachment,<sup>9</sup> lens subluxation, and suture erosion.<sup>10</sup> Iris suture fixation may avoid some of these complications and could be combined with an iris suture to close the PI. However, iris suturing is technically difficult at the best of times (eg, with good access and visualization as in the open-sky approach during PK) but is more difficult with the restricted access and poor view that is often the case in DSEK. These same problems also apply to PC Artisan placement, with enclavation on the posterior iris surface.

When gas is used to tamponade a DSEK graft in the presence of a PCIOL, the iris sphincter is pressed back against

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**FIGURE 1.** A, The patient had pseudophakic bullous keratopathy with an angle-supported ACIOL and a large PI. B, A temporal scleral tunnel was formed, and the angle-supported IOL was explanted. C, The Artisan IOL was introduced into the AC and rotated so that the haptics were aligned with the PI. D, After enclavation of the left haptics, the proximal margin of the PI was enclaved into the right haptics. E, The lens was positioned so that the distal margin of the PI could also be enclaved, thus largely closing the iridectomy opening. F, After insertion and positioning of the endothelial lamellar graft, gas tamponade was effective in holding the graft in place without leakage of gas into the PC (edge of graft shown by arrows).

the IOL, and this could cause iris sphincter ischemia, potentially leading to Urrets-Zavalía syndrome. For this reason, and for greater ease of fixation than that with PC placement, we prefer to place the Artisan in its conventional position in the AC.

The Artisan Model 205 for aphakia is available in a power range of +2.0 to +30.0 D. The lowest-powered lens can be used in this way in patients with aphakia where it is not desired to correct the refractive error significantly, but pupil occlusion is still wanted (eg, for bilateral aphakia with unilateral bullous keratopathy).

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