Complete iris loss after trauma causes severe aesthetic limitations, but it also can trigger visual impairment due to photophobia, optical aberration disorders, glare effects, and loss of depth of focus. Treatment in these eyes can be especially distressing for patients, as they are not only dealing with visual side effects but also the realization that one eye looks different from the other. Below I describe a case in which a new device—a foldable, biocompatible artificial iris (AI)—allowed me to exactly mimic the color and structure of the contralateral iris and to rapidly achieve visual and cosmetic rehabilitation.

The ArtificialIris (Dr. Schmidt Intraocularlinsen GmbH) is fashioned by using a photograph of the contralateral iris, thus ensuring a close match of the color and surface structure to the initial appearance. The device is made of silicone elastomer, similar to that used in IOLs, with a thickness of 0.25 mm peripherally and 0.40 mm centrally, an overall diameter of 12.80 mm, and a pupil size of 3.35 mm. It is available in two versions, with or without polymer meshwork, and may be inserted into the sulcus with or without sutures through a 2.0-mm incision. After having implanted 16 of these devices over the past year without any complications and with excellent results, I want to share this challenging case of an aphakic and aniridic patient.

**CASE REPORT**

A 52-year-old woman presented with diminished visual acuity in her right eye. She reported persistent glare and halos in this eye. Slit-lamp examination revealed a large iatrogenic coloboma with only a small rim of iris tissue left in the nasal and temporal quadrants, epikeratophakia, and postoperative aphakia. Her UCVA and BCVA were 20/100 and 20/80, respectively. Her medical history included treatment for a congenital cataract with intracapsular cataract extraction in early childhood and subsequent implantation of an epikeratophakia lenticule at the age of 32 years.

Corneal topography showed irregular astigmatism, and the interface of the epikeratophakia lenticule and the host cornea was hazy. We therefore decided to remove the epikeratophakia lenticule as a first step and subsequently implant an iris-fixated IOL (Artisan; Ophtec GmbH) with an AI as a second step.

**Figure 1.** The leading haptic is explanted together with the 25-gauge vitrectomy cannula. The optic is in the anterior chamber, and the trailing haptic is outside of the CCI.
The removal of the epikeratophakia lenticule was easy, the underlying Bowman layer was intact, and complete reepithelialization occurred within 4 days. Subsequent corneal topography showed stabilization after 6 weeks. At this time, biometry was performed and the IOL power calculated.

**FIRST INTRAOCULAR INTERVENTION**

A 5.6-mm superior clear corneal incision (CCI) and two paracenteses were created, through which an anterior 25-gauge vitrectomy was performed. The Artisan lens was then enclavated at the 3- and 9-o’clock positions. As there was not much iris tissue nasally, the iris was stretched centrally to ensure proper enclavation. The Artisan lens seemed to be securely fixated, and thereafter the AI was prepared (0.5 mm larger than the horizontal white-to-white distance) and injected into the anterior chamber using an SI-40 IOL injector (Abbott Medical Optics Inc.). The AI was manipulated so that it was enclavated on top of the Artisan lens and behind the remnant iris in the sulcus. Wound closure was performed using four 10-0 nylon sutures.

On day 1 postoperative, the slit-lamp examination showed a quiet eye with the Artisan lens and the ArtificialIris in situ. The cosmetic appearance was satisfying, and UCVA was 20/80. At 6 weeks postoperative, the sutures were removed and UCVA was still 20/80; BCVA was 20/60.

Three weeks later, the patient reported loss of vision without pain after having done minor exercises. Slit-lamp examination revealed a quiet eye with loss of the ArtificialIris and the Artisan lens into the vitreous.

**SUBSEQUENT INTERVENTIONS**

A second intraocular intervention was planned to remove both devices. After standard 25-gauge pars plana vitrectomy was performed using perfluorocarbon liquid, the ArtificialIris and the Artisan lens were removed through a 5.6-mm temporal CCI. Three months after this
second intervention, the eye was quiet, no retinal complications were observed, and BCVA was 20/100.

At that time, we decided to implant a posterior chamber foldable lens with a new ArtificialIris using a novel technique recently described by Totan1 to fixate the lens: trocar-assisted sutureless intrascleral IOL fixation. In this technique, briefly, two transconjunctival scleral tunnels at the 3- and 9-o’clock positions, 2.0 mm behind the limbus, were prepared with 25-gauge transconjunctival sutureless vitrectomy trocars. The microcannulas were left in place, and an anterior chamber maintainer was placed at the 6-o’clock position. A 3.8-mm CCI was created at the 3-o’clock position, and a paracentesis was created at the 12-o’clock position.

Next, a three-piece foldable IOL (MS 614; Dr. Schmidt Intraocularlinsen GmbH) was folded with folding forceps, and the leading haptic was inserted into the anterior chamber through the CCI. Then 25-gauge retinal forceps were inserted into the posterior chamber through the nasal 25-gauge cannula to grasp the tip of the leading haptic. The tip and the 25-gauge cannula were then explanted simultaneously through the sclerotony (Figure 1). The folded optic was then implanted in the anterior chamber, and the trailing haptic was grasped with 23-gauge vitrectomy forceps through the 12-o’clock paracentesis. Next, the trailing haptic was approached by 25-gauge retinal forceps inserted through the temporal 25-gauge cannula, and again the haptic and the cannula were simultaneously explanted through the sclerotony. A 9-0 nylon suture was placed over the sclerotony sites to secure the haptics. The haptics were left in place in the scleral tunnels.

Subsequently, the ArtificialIris was injected into the anterior chamber, as described above, and pushed into the ciliary sulcus behind the remaining iris, on top of the IOL (Figure 2). Two transscleral securing 10-0 polypropylene sutures were placed through the ArtificialIris at the 12-

and 6-o’clock positions. At the end of surgery, the paracentesis and CCI were closed with hydration.

This novel technique facilitates small-incision surgery with minimal trauma to the eye and rapid visual recovery. In this case, the patient had an excellent cosmetic result (Figure 3) with a postoperative BCVA of 20/60, without disabling photophobia and glare effects.

LESSON LEARNED

Fixating an Artisan aphakia lens in patients with what we think is just enough iris should be avoided. Minor trauma or even slight exercise, as in this case, can lead to dislocation of the implant. With new intrascleral fixation techniques, small-incision intraocular surgery is possible with good stabilization and centration of the IOL.

Until now, iris reconstruction was a challenging surgical procedure requiring large sclerocorneal incisions and often resulting in poor cosmetic outcomes. With the ArtificialIris, small self-sealing incisions are possible, enabling fast visual recovery and excellent cosmetic outcomes. The device may be used for complete or partial iris reconstruction.

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