CASE REPORT

The 8-ball surprise

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A rare case of total aniridia and vitreous hemorrhage 2 months after intraocular lens (IOL) exchange through a 6.0 mm limbal incision using a scleral fixation technique in a patient denying any trauma is presented. Extrusion of iris tissue in pseudophakic patients has been reported before, usually associated with globe rupture or dehiscence of corneal or scleral wounds, but to the authors’ knowledge, this is the first reported case of complete iridodialysis occurring after implantation of a scleral-fixated IOL with no obvious history of trauma. The uprooting mechanism of the iris and its disappearance from the eye are discussed.

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Online Video

Iris defects, whether congenital, iatrogenic, or traumatic, limit the function of the iris as a diaphragm that regulates the amount of light entering the eye and result in a decrease in depth of focus and an increase in spherical and chromatic aberrations arising from the crystalline lens.\(^1,2\) Because the iris root is one of the weakest parts of the iris, blunt trauma or penetrating eye injuries may be causative for tearing or separation of the iris from its ciliary body attachment.\(^3\) Especially in total iridodialysis, besides the cosmetic aspect that might be of concern, symptoms such as visual deterioration, photophobia, and glare can occur; hence, surgical correction may be required.\(^4\)

CASE REPORT

A 60-year-old man presented with progressive visual deterioration over the previous few days, 3 years after uneventful bilateral phacoemulsification cataract extraction and subsequent insertion of an intraocular lens (IOL) in the bag, which was performed in another hospital. The patient reported a history of blunt trauma by a tennis ball to his left eye prior to cataract surgery. Otherwise, no ocular comorbidities were found, and the only systemic disease known was arterial hypertension.

Corrected distance visual acuity (CDVA) decreased from 20/15 to counting fingers in the left eye. The IOL was found to be decentred and tilted, with an open posterior capsule, zonulolysis, and one haptic being displaced outside the capsular bag (Figure 1).

Consequently, the IOL and capsular bag were removed, followed by anterior vitrectomy and implantation of a 3-piece IOL using scleral fixation with the Yamane technique.\(^5\) Because the IOL was not cut, a 6.0 mm superior limbal incision was made and, afterward, secured with 3 10-0 nylon interrupted sutures. When the patient was seen 4 days postoperatively, CDVA was 20/20 (+0.5+1.0×25), and 1 loose corneal suture was removed. Three weeks postoperatively, CDVA remained the same; however, an increase in astigmatism (−3.0+3.0×35) was noticed. A secondary corneal suture was placed on the flattest corneal meridian. Performed twice, the astigmatism was partly corrected, and all the sutures could be removed 2 months postoperatively with a consistent CDVA of 20/20 (−1.75+1.75×20) and an intraocular pressure (IOP) of 14 mm Hg.

However, the patient returned 2 days later, complaining about severe loss of vision, and slitlamp examination revealed a total hyphema, referred to as 8-ball hyphema, because of its appearance when filling out the entire anterior chamber (AC). There was no pain, and the patient denied any kind of trauma. At follow-up appointments during the next few days, no subsiding of the hyphema was noted, and an ultrasound B-scan showed vitreous hemorrhage whereas the retina was intact and flat. IOP in the affected eye ranged from 24 to 34 mm Hg; thus, antiglaucomatous therapy was initiated (timolol 0.5%, 2 times a day, brimonidine, 2 times a day, and acetazolamide 125 mg, 2 times a day).

The patient was scheduled for surgery 1 week after the initial occurrence of the hyphema to remove the blood from the anterior and posterior segments through AC irrigation and pars plana vitrectomy (Supplemental Digital Content 1, Video 1, available at http://links.lww.com/JC9/A349). When aspirating the blood from the AC by bimanual irrigation/aspiration, an abnormality, which was initially considered to be an extremely dilated pupil, became visible. It became quite clear that the iris was missing. The retina was fully attached, and a small...
suspicious area surrounded by retinal hemorrhage was prophylactically treated by laser photocoagulation. The globe appeared intact, and no definite origin of the hemorrhage could be identified. Postoperative treatment consisted of bromfenac 2 times a day for 6 weeks, ofloxacin 3 times a day for 5 days, and prednisolone 10 mg/mL 4 times a day tapered over 1 month. A routine blood test, implemented on the day of surgery, showed anemia, thrombocytopenia, and elevated liver enzymes; hence, further workup was recommended.

Postoperatively, the most remarkable finding was a complete absence of iris tissue (Figure 2). No trace of iris could be detected in the AC, vitreous cavity, or subconjunctival area, and total aniridia with visible ciliary processes was confirmed on gonioscopy (Figure 3). The incision site was well adapted with no pigment entrapped within the wound. During subsequent follow-up visits, the IOL was centered, the retina attached, and vision was restored in the affected eye (CDVA: 20/20 with −0.25 sph), but the patient was disturbed by halos and glare.

After 2 months, when IOP stabilized within normal levels and intraocular inflammation subsided, an artificial iris was implanted to reduce the patient’s photophobia (Human-Optics AG) (Figure 4). The patient is still on antiglaucomatous therapy to control his IOP, whereas he is no longer affected by halos or glare.

**DISCUSSION**

Aniridia is defined as a partial or total absence of the iris and can be either congenital or acquired, with the latter occurring after ocular surgery or trauma.6 In our patient, the hyphema was supposedly caused by the disinsertion of the iris, and because it arose 2 months after IOL exchange, the lack of a temporal connection makes it highly unlikely to be seen as a surgical complication.

Apart from arterial hypertension, no systemic disease was known, and the laboratory parameters that were found to be pathologic in a routine blood test may at most have promoted bleeding but still could not explain iris rupture. A predisposition to intraocular and suprachoroidal hemorrhage may have been present due to the patient’s thrombocytopenia and anemia, and the risk for suprachoroidal hemorrhage may have furthermore been increased by vitrectomy. However, an ultrasound B-scan was performed after the occurrence of the hyphema, and suprachoroidal hemorrhage was ruled out.

On repeated questioning, our patient denied any trauma that may have affected the eye in the time between his last postoperative visit at the hospital and the onset of the bleeding, which left us with a mysterious case and very few causative options to consider. Possibly, subtle trauma after suture removal went unnoticed by the patient, whose history of elevated liver enzymes could indicate alcohol-related liver damage, which again would increase the likelihood of unnoticed trauma.

Although rare, traumatic aniridia in pseudophakic patients has been reported, usually associated with globe rupture or dehiscence of corneal or scleral wounds.7–9 Ball
et al., in a case similar to ours, assumed that the completely disinserted iris tissue remained within the eye, was expelled through a new traumatic wound, or prolapsed through a previously constructed surgical incision. Parmeggiani et al. added the possibility of disinserted iris tissue being phagocytosed by macrophages or trabecular meshwork cells, leaving behind a band of exogenic particles along the anatomic iris position. In our patient, no trace of iris tissue could be detected in the AC, vitreous cavity, or subconjunctival area, and there was an acute rise in IOP with no evidence of globe rupture on examination, which made the options of residual iris tissue or expulsion through a new wound less plausible.

A probable mechanism of postoperative aniridia, first provided by Navon and later acknowledged in similar cases in the literature, stated that the force of a trauma exerted on the globe transiently disturbs the cataract incision, causing it to leak. Aqueous outflow then creates a relative vacuum anterior to the iris by the Bernoulli principle, pulling the iris forward to plug the leak. A sudden block in aqueous flow then creates a pressure gradient that disinserts the iris at its thinnest point, the root, and delivers it through the wound. Subsequent aqueous outflow depressurizes the eye, preventing wound extension or creation of new rupture sites, and the chamber reforms by the self-sealing properties of the wound or blockage by clotted blood.

Small-incision cataract surgery has resulted in greater stability and safety of the procedure, and self-sealing, clear corneal wounds appear to withstand high pressures. Even so, few cases have been published describing wound dehiscence after blunt trauma, with a timeline ranging from the early postoperative period to as late as 7 years postsurgery. However, as described earlier, those incisions may act as a release valve in the setting of a sudden increase in IOP. They somehow protect the eye and result in less damage than would be expected for unoperated eyes with the same degree of trauma. Furthermore, it has been postulated that foldable IOLs may yield more favorable outcomes as opposed to rigid IOLs because they not only hold back posterior segment contents but also behave similar to a trampoline in absorbing the impact of the force and reverting it to its original position. This is supported by the fact that, even in pseudophakic patients who had experienced severe blunt trauma to the eye, aniridia occurred as an isolated injury, whereas the rest of the ocular structures remained intact, and vision returned to pretrauma levels.

Although traumatic aniridia mostly occurs after a severe blow to the eyeball with significant globe injury and our patient denied any trauma, we are intrigued by the similarities of our case to other reports of aniridia after blunt trauma. However, in most of those cases, clear corneal incisions between 3.0 and 3.5 mm were placed during cataract surgery and left unsutured. In our patient, a luxated IOL and damaged capsular bag were explanted through a 6.0 mm superior limbal incision, which was secured with 3 sutures. The fact that smaller wounds are known to withstand higher pressures led us to assume that, maybe, in our patient, contusion to a lower extent may have been sufficient to cause iris disruption. This is supported by a case reported by Romanazzi et al., in which an apparent minor trauma, consisting of no more than an eye getting hit by a newspaper, led to a complete hyphaema, 270-degree iridodialysis, and traumatic cataract with lens subluxation. The authors suggested that, although the trauma was negligible, the particular distribution of the forces on the anterior segment provoked such a large iridodialysis.

We believe that, in our case, the most likely explanation is that some mild blunt trauma, even if not worth mentioning or realized by the patient, such as rubbing the eye or some kind of strenuous activity, led to the dehiscence of the 6.0 mm corneal wound used for IOL exchange 2 months prior to the accident. Of interest, the scleral-fixated IOL stayed well centered and unaffected.

WHAT WAS KNOWN
- Extrusion of iris tissue in pseudophakic patients has been reported before, usually associated with globe rupture or dehiscence of corneal or scleral wounds.

WHAT THIS PAPER ADDS
- To the authors’ knowledge, this is the first reported case of complete iridodialysis occurring after implantation of a scleral-fixated intraocular lens with no obvious history of trauma being present.

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Disclosures: None reported.