

Glaucoma in a Patient With Spontaneous Luxation of the Globe

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CASE REPORT

A 58-year-old black female whose past medical history was significant for type II diabetes mellitus, hypertension, and morbid obesity was evaluated at the Duke University Eye Center in Durham, North Carolina, approximately 3 years ago for primary open-angle glaucoma (POAG). Since her initial diagnosis 15 years earlier, she had undergone argon laser trabeculoplasty in both eyes. Her medical regimen included Alphagan b.i.d. and Lumigan q.n. (both manufactured by Allergan, Inc., Irvine, CA), as well as Cosopt (Merck & Co., Inc., Whitehouse Station, NJ). She was using these medications in both eyes.

On external examination, the patient was significantly proptotic. She stated that she had had prominent eyes since childhood and that she could luxate both globes voluntarily. The patient's BCVA was 20/400 OD and 20/70 OS. Her IOP measured 17 mm Hg OD and 31 mm Hg OS. Her color vision was normal, and a slit-lamp examination revealed bilateral punctate corneal erosion. Gonioscopy showed open angles to the scleral spur over 360° in both eyes. Her

cup-to-disc ratios were 0.9 OD and 0.7 OS. Pachymetry measured 507 μ m OD and 510 μ m OS. Visual field testing revealed significant double arcuate defects in both eyes.

Due to the patient's advanced glaucoma and uncontrolled IOP, she underwent a trabeculectomy in her left eye. Her IOP measured 8 mm Hg on the first postoperative day. By 1 month postoperatively, she had a nicely elevated bleb, her IOP measured 10 mm Hg, and her BCVA was 20/80.

The patient was lost to follow-up and returned to our clinic 18 months after she underwent trabeculectomy in her left eye. Her visual acuity was still 20/400 OD but had declined to 20/200 OS. Her IOP measured 22 mm Hg OD and 46 mm Hg OS. An examination showed a scarred superior bleb in her left eye and total cupping of both optic nerves. While we were measuring the patient's IOP, her right eye spontaneously luxated, and she was in significant pain until we were able to reposition the globe. Gonioscopy revealed open angles bilaterally, and visual field testing showed progressive loss in her left eye that was consistent with her worsening glaucoma.

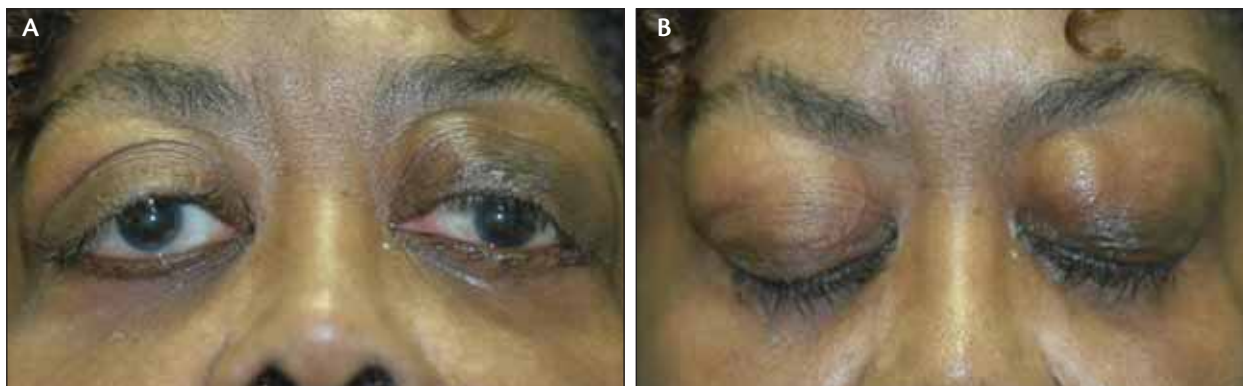


Figure 1. The plates of the glaucoma drainage devices are visible through the open (A) and closed (B) superior eyelid of the patient's left eye.

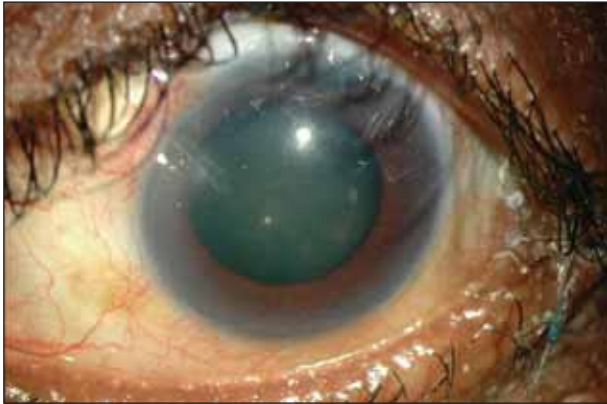


Figure 2. A photograph of the patient's left eye shows two drainage tubes in the anterior chamber and an intact lateral tarsorrhaphy.

HOW WOULD YOU PROCEED?

1. Would you perform another trabeculectomy in the patient's left eye despite extensive scarring from the previous procedure?
2. Would you install a drainage device? If so, what device would you use?
3. Would the tendency for the patient's globes to luxate spontaneously influence your treatment plan? What complications might affect the effectiveness of additional surgical interventions?
4. Would lateral tarsorrhaphy be an appropriate option for preventing the globe's luxation?

SURGICAL COURSE

Because the patient's IOP was significantly elevated and her glaucoma was advancing rapidly, we decided to place an Ahmed S2 Glaucoma Valve (New World Medical, Inc., Rancho Cucamonga, CA) and a Baerveldt 350 Glaucoma Implant (Advanced Medical Optics, Inc., Santa Ana, CA) in her left eye (Figure 1). We chose the former to attenuate her IOP immediately and selected the latter (closed with the customary Vicryl suture [Ethicon, Inc., Somerville, NJ]) to provide better long-term control. The Ahmed was placed superonasally and the Baerveldt placed superotemporally, because her proptosis created adequate space in the superior part of the orbit to accommodate these devices. The tubes were placed in the anterior chamber before the patient underwent tarsorrhaphy. The patient's conjunctiva was too scarred to permit a second trabeculectomy.

We were concerned that the addition of two drainage devices to an orbit that was already tight could render the patient unable to reposition the globe should it luxate. Using a procedure described by Johnson and Vestal,¹ we therefore performed a lateral tarsorrhaphy.

By 2 weeks postoperatively, the patient's visual acuity was unchanged, and the IOP of her left eye was controlled at 17 mm Hg.

A slit-lamp examination revealed two tubes in a deep and quiet anterior chamber. The patient also had an intact tarsorrhaphy extending 4 mm from the lateral canthus of her left eye (Figure 2).

OUTCOME

On follow-up, the patient's IOP has ranged from 8 to 22 mm Hg on no medication. The lateral tarsorrhaphy prevents the patient's left eye from luxating, but this phenomenon occasionally occurs in her right eye (Figure 3).

DISCUSSION

Although the spontaneous luxation of the globe is uncommon, this type of dislocation occurs most often in patients with shallow orbital sockets, anteriorly situated globes, and floppy eyelids that migrate behind the globe during its protrusion.² Other conditions associated with this phenomenon include abnormalities of the extraocular muscles, laxity of the orbital ligaments, displacement of the orbital septum, neoplasia, and additional pathologies related to exophthalmos such as hyperthyroidism.¹

Luxation may occur spontaneously, as a result of trauma, or voluntarily as with the patient described herein. Although the eye's anterior displacement may primarily appear to be a cosmetic issue, this process places traction on the optic nerve that could induce an optic neuropathy.³ Additional adverse consequences could occur if the luxation strained the retinal vasculature and precipitated thrombosis of the retinal veins^{4,5} or if it caused wounds to dehiscence postoperatively.¹ The literature does not specifically describe the effects of luxation on patients with glaucoma. Our patient, however, clearly required intervention to lower her IOP and slow the progressive visual field loss in her better-seeing left eye.

Before we placed the Ahmed and Baerveldt tube shunts in the patient's left eye, we had to consider the complications that could be introduced by the postoperative luxation of the globe. Because increased proptosis is a reported complication of tube shunts,⁶ we were concerned that placing these devices in an eye that was already anteriorly displaced could increase the frequency of spontaneous luxations. In addition, should luxation occur, we might not be able to reposition the eye due to the presence of the tube shunts' reservoirs in the orbit. Given these risks and the potential for dehiscence of the ocular wounds, we decided that lateral tarsorrhaphy was the best option to prevent the luxation of the patient's left eye.

Johnson and Vestal effectively used a lateral tarsorrhaphy



Figure 3. The patient retains the ability to luxate her right globe voluntarily.

to prevent spontaneous luxation in a patient undergoing bilateral cataract surgery.¹ They performed the procedure on the first eye after a luxation caused the corneal wound to dehisce. To avoid this complication in the patient's second eye, they placed the lateral tarsorrhaphy prior to cataract surgery. We believe that lateral tarsorrhaphy is also a viable strategy for preventing the luxation of the globe in patients undergoing other types of intraocular surgery such as for glaucoma. □

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