

Unioocular Patient With Nanophthalmic Eye

BY RICHARD PACKARD, MD, FRCS, FRCOPHTH

This case had a poor outcome for the patient and several lessons for me.

HISTORY AND EXAMINATION

A 63-year-old male patient presented with diminished vision in his only eye. He had lost his other eye to cataract surgery following a penetrating injury some 28 years earlier under circumstances at that time unknown to me. His remaining eye had a shallow chamber, narrow angles, and increasing nuclear sclerosis. His vision with +9.00 D glasses was 20/40, and he wished to continue to drive.

I explained to the patient that his surgery might be challenging but that I had operated on similar eyes with good results. I told him I thought that it was probably better to proceed with surgery at this stage rather than at the time of an emergency due to angle closure or when the nucleus took up even more room. The IOP measured 25 mm Hg.

During the preoperative examination, the axial length was 20 mm, and the anterior chamber depth was 1.5 mm. The required lens power was 45.00 D, so I planned to use piggyback IOLs. I thought there would be plenty of room to implant one lens in the bag and one in the sulcus once the nucleus had been removed.

I envisaged that the pupil might not dilate well and that a heavy viscoelastic like Healon5 (Abbott Medical Optics

Inc., Santa Ana, CA) would be needed to deepen the chamber and dilate the pupil to permit the creation of the capsulorhexis. I planned to perform coaxial microincisional surgery to minimize the size of the wound as well as of the sleeve and tip in the eye.

SURGICAL COURSE

The pupil was dilated to 5 mm in the normal way prior to surgery using phenylephrine 2.5% and tropicamide 1% drops. The eye received topical anesthesia with lidocaine 2% gel, which was to be augmented by intracameral lidocaine 1% at hydrodissection.

As I created the phaco incision, the anterior chamber collapsed, and the iris started to prolapse out of the wound (Figure 1). An injection of Healon5 did not deepen the anterior chamber; the ophthalmic viscosurgical device came straight out again. I knew I could not continue as planned and determined instead to try to deepen the chamber and decompress the eye to allow me to complete the surgery. Because it was already open, I did not want to massage the eye. Intravenous mannitol would have taken a while to act, and in retrospect, it would have been a good idea preoperatively.

The standard teaching on dealing with this situation is to perform a dry pars plana vitrectomy (Figure 2). I created a small peritomy and, mindful that short eyes have



Figure 1. The iris prolapsed through the wound.



Figure 2. Dr. Packard performed a vitrectomy to deepen the anterior chamber.



Figure 3. The nucleus at the moment of descent.

anteriorly placed pars planas, made an incision about 2.5 mm behind the limbus. The vitrectomy was, I thought, uneventful. It was carried out with reasonable visibility of the vitrectomy probe, and the chamber seemed to deepen well.

Healon5 now entered the anterior chamber easily and dilated the pupil to 7 mm. I created the other sideport incision without difficulty. The capsulorhexis was straightforward, so I thought the case was on track for a successful outcome. I carried out the hydrodissection and achieved good nuclear mobility.

I started to create a small trench to enable me to bury the Kelman tip (Alcon Laboratories, Inc., Fort Worth, TX) that I use with torsional phacoemulsification to chop the nucleus. I was about to engage the nucleus when I noticed that the chamber had suddenly deepened markedly and the nucleus had slipped into the midvitreal (Figure 3) and, very shortly thereafter, even farther back. Initially, I considered that I might be able to rescue the nucleus with some sort of posterior assisted levitation (PAL) technique. That thought lasted about a second, as I realized that it would be foolhardy and dangerous to attempt this maneuver in a unioocular patient with the nucleus already so far back.

This case marked the first occasion in my phaco career (at that stage, 28 years) that I called on a vitreoretinal surgeon to remove a nucleus from the posterior segment. As they say, if you do surgery long enough, almost everything will happen to you! I decided not to implant an IOL at this stage, even in the sulcus, because I was not sure whether the retinal surgeon would prefer to float up the nucleus on perfluorocarbon “heavy liquid” to remove it.

I explained to the patient that the surgery had not gone well and that at least one further operation would be required. Not surprisingly, he was upset. I arranged for him to have a consultation the next day with the retinal surgeon, who scheduled surgery for the same day. This procedure also proved to be challenging. The retina had been perforated by the “pars plana” incision, and in fact, it was impossible to elucidate where exactly, if at all, the pars plana was. The retina had started to detach at the perforation and had to be dealt with at the same time as the nucleus’ removal. The surgeon employed perfluorocarbon liquid and used silicone oil to flatten the retina.

The patient was again left aphakic, because it was not certain whether the eye would recover from the surgery. If it did, then some sort of secondary lens might be inserted during a third procedure.

OUTCOME

Eventually, the eye stabilized and, with an aphakic contact lens, attained a visual acuity of 20/80. All in all, this

was a poor outcome. I was keen to try to get a high-powered three-piece lens made by one of the companies that will manufacture them (such as Acri.Tec GmbH [Berlin, Germany]), but the patient was unwilling to proceed.

LESSONS LEARNED

Cataract surgery in very short eyes may require multiple maneuvers to render them operable (eg, using mannitol to soften the eye, ocular massage). Performing a pars plana vitrectomy can be hazardous, because the anatomy of these eyes is variable. Acri.Tec GmbH makes very high-powered lenses in its Extreme range (not available in the United States), so piggybacking is unnecessary. Surgeons must carefully and fully counsel patients who have nanophthalmic eyes that require cataract surgery, especially if they have lost the fellow eye during previous cataract surgery.

So, why did this nucleus descend in the dramatic way that it did? The obvious reason is to suggest that, during the original vitrectomy to decompress the globe, the posterior capsule became damaged. I saw a similar case presented at the 2009 ASCRS annual meeting by an eminent surgeon who assumed the same. It was not until I came to write a full report on the incident, however, that an interesting piece of evidence came to light. While I was searching through the patient’s record, I came across the original operative note from the surgery on his other eye after a penetrating injury, carried out in 1959 by my predecessor in Windsor. It seems the nucleus had dropped in this case, too, the surgery having been an extracapsular cataract extraction. It may well be that the patient had some sort of defect in his posterior capsule, which allowed this problem to happen in both eyes. Of course, that may be wishful thinking on my part to assuage my hurt pride, and it does not help this patient in any way.

As experienced and normally highly successful surgeons, we need to remember that unioocular patients are just that and there may be no way back. ■

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