Suprachoroidal Hemorrhage

BY BRIAN LITTLE, MA, FRCS, FRCOPHTH, FHEA

We surgeons all eventually have at least one case that haunts us. This one still makes me shudder more than 10 years after it happened, which was not long after I was first appointed as consultant. To add insult to injury, the entire event was faithfully recorded on video, so it can be used in perpetuity by future generations of ophthalmologists. I currently use it regularly myself to illustrate the potentially devastating consequences of failing to respond to the early warning signs of impending disaster.

Above all in such cases, we must learn to swallow our pride, which can stick in our throats. Then, we must try to learn something constructive from our experience. Although we chose to become surgeons and not psychologists, we have to accept that we are subject to the same laws as all other mortals when it comes to understanding how we learn and how we behave under stressful conditions.

THE CASE

The case involved a blinding intraoperative suprachoroidal hemorrhage in the eye of an 82-year-old retired lawyer during otherwise uneventful, "routine" phacoemulsification. The surgery was performed under my supervision by a senior resident, and no preoperative clinical features had suggested a particularly high-risk case. Everything was going according to plan until the later stages of cortical removal. Just as the senior resident was polishing off the last few strands of a central plaque on the posterior capsule, fairly forceful and persistent shallowing of the chamber developed. There was some spontaneous expulsion of the cohesive viscoelastic around the I/A tip, and the posterior capsule bulged through the capsulorhexis. After discerning elevated tension (in more than one sense) and exiting the eye, the senior resident deepened the chamber with a cohesive ophthalmic viscosurgical device (OVD), which remained in the eye this time, because the self-sealing wounds had all now closed. Next came the fateful decision as to whether or not to complete the surgery, which required only the insertion of the lens implant. We discussed this, all too briefly, and decided to "just slip in the IOL"—at that time, a foldable three-piece acrylic lens requiring forceps delivery. The choice did not seem unreasonable, but it became the first spiral in a downward vortex of surgical doom.

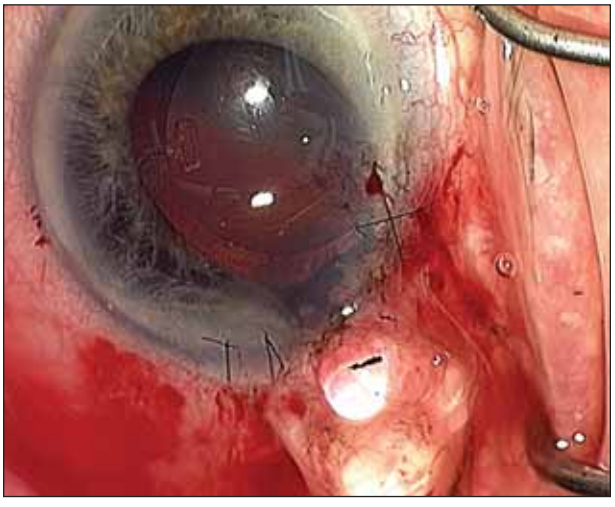

Figure 1. Upper-half grey reflex. Spontaneous expulsion of the OVD. IOL up against the cornea.

"The choice [to implant the IOL] did not seem unreasonable, but it became the first spiral in a downward vortex of surgical doom."

During the implant's delivery through the (enlarged) wound, the majority of the OVD came straight out of the eye, and the chamber shallowed. The senior resident then pronated one hand and opened the forceps in an attempt to rotate the lens and release the optic into the bag. The bulging, drum-skinned posterior capsule was torn by the edge of the folded optic, and vitreous then prolapsed around the lens as it was released

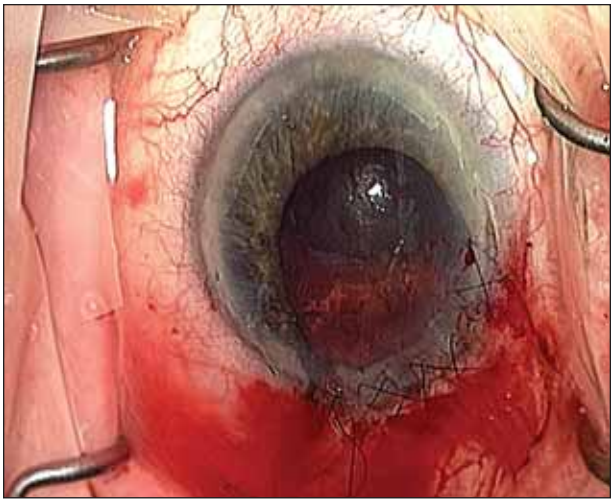

Figure 2. After the IOL's removal, the iris is incarcerated in the wound, and a suprachoroidal hemorrhage extends across the central pupil.

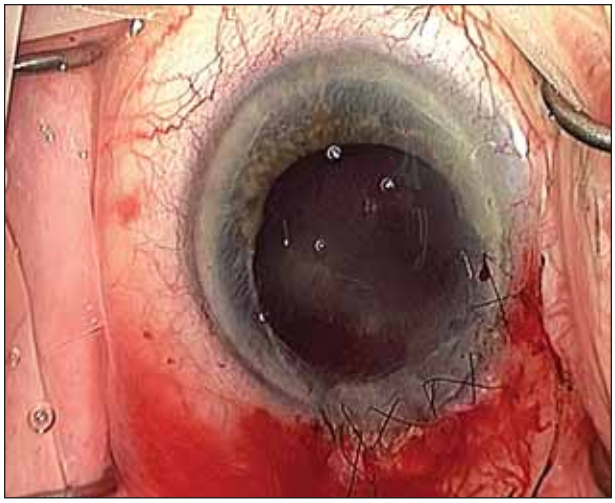

Figure 3. After an anterior vitrectomy, a suprachoroidal hemorrhage extends almost completely across the pupil.

from the forceps, although this was not recognized when it happened. All attempts to deepen the chamber with an OVD failed, and aggressive flattening of the chamber resulted in iris prolapse out of the sideport incision. To make things worse, the implant was now pressed flat up against the corneal endothelium, and a grey reflex was becoming apparent from the periphery (Figure 1).

I took over the surgery and immediately experienced a deeply uncomfortable epiphany: I had never before been faced with this situation, but I bore full responsibility for deciding how to proceed. I rushed ahead and decided that, in order to save the cornea, I would enlarge the incision and remove the implant. My mistake seems glaringly obvious now, but most of us can probably appreciate that nothing ever seems so self-evident down the microscope when we are under duress as it does when we view it through the "retrospectoscope" in the calm light of day.

Out came the implant … and vitreous … and iris. Anterior vitrectomy instruments available at that time were coaxial and were used through the main incision. They caused the wound to gape and the incision to leak, both of which washed more vitreous out through the wound while lowering the IOP close to atmospheric pressure, thereby decompressing the eye. By now, a grey reflex had begun to extend posteriorly, reflecting the steady flow of subretinal blood tracking back to the macula (Figure 2). I finally closed the main wound and sutured it with great difficulty. Because I could not push or pull it back inside the eye, I excised the iris that had prolapsed through the sideport incision.

At this point, half an hour after I took over the case, the grey reflex had tracked back under the macula, and virtually the entire red reflex was greyed out (Figure 3).

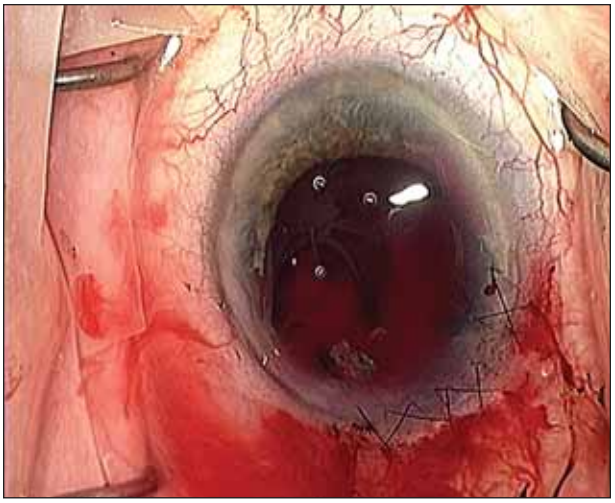

Figure 4. An iris root hemorrhage after internal sweeping of the incarcerated iris out of the wound.

The deathblow came when I had to release some incarcerated iris strands from the main wound. I swept them in centrally using a cyclodialysis spatula through the sideport incision. The traction required for this maneuver was sufficient to rupture an iris root vessel. I have not yet mentioned that the patient was taking anticoagulants for atrial fibrillation! Fairly brisk and profuse bleeding ensued before I could staunch the flow, and much of it, of course, gravitated back into the vitreous cavity.

I had turned a complication into a catastrophe, ending up with a suprachoroidal hemorrhage that tracked under the macula, a vitreous hemorrhage, and a hyphema (Figure 4).

THE OUTCOME

My next duty was to inform the patient and his family what had happened as soon as possible with a clear and unambiguous explanation. Although we surgeons naturally want to offer the possibility of a positive outcome, in this situation, it would have been misleading, because the visual prognosis was uniformly wretched. This case presents one of very few complications for which removing all hope is the only honest option, although a distinctly uneasy one. They understood exactly what had happened and were disarmingly accepting to the point of expressing their gratitude for the explanation. The patient himself was unusually philosophical and accepted this outcome as "one of those things that happens." He ended up with light perception in this eye. Fortunately, his other eye had reasonably good vision with only an early cataract.

THE LESSONS

I learned a lot from this disaster. It was a deeply upsetting experience for all involved, and I felt directly responsible for what had happened. I reflected in great detail on the sequence of events in order to understand what precisely had happened, why it had happened, whether it could have been avoided, and if it could be avoided in the future.

It was clear that, because of my inexperience with intraoperative suprachoroidal hemorrhages, I had been slow to recognize and react appropriately to the early signs that it was happening. Spontaneous expulsion of an OVD from the chamber combined with flattening of the anterior chamber can safely be assumed to be a suprachoroidal hemorrhage until proven otherwise. If we suspect this complication, we should close the eye immediately and then take a calm look with the binocular indirect ophthalmoscope. If the view is poor, a B-scan ultrasound is always helpful. Whether our suspicion is right or not, the consequence is the same in that we come back after a delay and complete the surgery, and we can then expect a good result. No advanced technical skills are needed to sort this out. In this case, I should have remained calm, assessed the situation, and considered the available options before deciding on the best plan of action. This is an issue of mindset and has nothing to do with surgical skills, although it is at the heart of what makes a good surgeon.

COGNITIVE SKILLS

Information Gathering

My case demonstrates the impact of our cognitive skills on the surgical outcome. The first signs of trouble were a shallowing chamber and the OVD's expulsion during polishing of the posterior capsule. Our first step should be to take in this information and acknowledge that something is definitely not right. Next, we need to act on this information and try to identify possible causes.

Assessment of the Situation

We know that there are a limited number of causes of positive pressure, including pressure from the speculum, posterior misdirection of irrigating fluid, a delayed retrobulbar hemorrhage, a large volume of peribulbar or retrobulbar anesthetic, a suprachoroidal hemorrhage, and maybe a full and heavy drainage pouch on the drape. Our next step is to compare the predicted behavior of each of the differentials with the observed behavior of the case. The forceful shallowing was of late and rapid onset, and it was persistent once it developed, which pretty much rules out all of the differentials except for a suprachoroidal hemorrhage.

Decision Making

Finally, we must devise a plan of action that respects the core principle of doing what is safest and best for the patient. It will vary widely depending on our level of surgical experience, our degree of confidence about dealing with a rare acute event, the availability of correct instruments and equipment, the presence of experienced scrub staff, etc. The correct decision may well be to do nothing at this point in time. We may decide to close up the eye, explain to the patient that this was the safest option that is likely to get him or her the best end result, and make an appropriate referral. There is absolutely no shame in taking this course of action; rather, it demonstrates that we have the self-discipline and humility to put the patient's interests before our own. Neither is there any harm in giving ourselves more time, if we need it, to fully assess the situation. As Thomas Jefferson said so succinctly, "Delay is preferable to error."

In this case, doing nothing would have been exactly the right action to take with a suspected suprachoroidal hemorrhage. I should have hydrated the wounds to close them and pressurized the eye to tamponade the hemorrhage. In 10 days, the blood would have liquefied and been reabsorbed, and I could have completed the surgery.

CONCLUSION

Few of us are taught cognitive skills during our training, but they are invaluable in both avoiding and dealing with complications. With the recent development of surgical simulators, I hope that cognitive skills training will be incorporated into residency programs so that young surgeons may prepare for rare complications such as suprachoroidal hemorrhages without exposing a patient's eye to risk. I have undeniably learned from my mistakes, but it is such a shame that someone lost the sight in one eye at the start of my learning curve.

My patient did not come back to me for cataract surgery on his second eye, despite his philosophical and forgiving attitude. Who can blame him? ■

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