Cataract surgeons give tips on operating with silicone oil in the eye

July 21, 2021

3 min read

Save

Welcome to another edition of CEDARS/ASPENS Debates. CEDARS/ASPENS is a society of cornea, cataract and refractive surgery specialists, here to discuss some of the latest hot topics in ophthalmology.

Patients with silicone oil in the eye can be difficult for cataract surgeons. **Timothy Page, MD,** and **Gary Wörtz, MD,** join us this month to discuss some tips for surgery on these eyes and explain how the oil affects IOL selection. We hope you enjoy the discussion.

Kenneth A. Beckman, MD, FACS
OSN CEDARS/ASPENS Debates Editor

Intraoperative tips

Retina surgeons send us patients with silicone oil in the eye to remove cataracts, and they need the oil to stay in the eye to prevent a retinal detachment. It would be preferable if the oil could be removed first and then perform cataract surgery. However, sometimes there are circumstances in which we have to operate

when the oil is still present.

There are several challenges with silicone oil in the eye. Any time a patient has had posterior segment surgery, the risk for posterior capsule rupture increases. If this happens in an eye with silicone oil, it will come gushing forward, following the path of least resistance out of the eye and increasing the risk for retinal detachment.

In patients with silicone oil, even when there is no zonular defect or dialysis, oil will percolate up into the apex of the cornea in tiny globules, obscuring your view. If you see these, keep the anterior chamber pressurized, always filling the anterior chamber with dispersive ophthalmic viscosurgical device (OVD) before removing the phaco needle. As OVD fills the anterior chamber, it will sweep those globules of silicone to the incision to improve your view. Then with the anterior chamber pressurized, you may come out of the incision with the phaco needle.

For cataract removal, I prefer to use a femtosecond laser if possible. These cataracts are always dense — it is the reason the retina surgeon refers them — and the laser makes our job infinitely easier. My typical phaco technique is phaco chop, but with a dense nucleus, stop and chop may be easier on the zonules.

Surgeons should anticipate that the posterior capsule and cells will often have a fibrous consistency. There is a limit as to how much of this fibrous opacity can be removed, and the surgeon should weigh the risks of an aggressive capsule polish to using a YAG laser later.

For more information:
Timothy Page, MD, can be reached at Oakland Ophthalmic Surgery, 800 South Adams Road, Suite 201, Birmingham, MI

48009; email: tpagemd@yahoo.com.

IOL calculations

When I am evaluating a patient who has silicone oil in the eye, the most important thing to ascertain from the retina specialist is whether the oil will be staying in the eye or coming out. So, sometimes we are operating in the theoretical. There may be a plan for the oil to come out; however, we always know it may need to go back in if there is a recurrent detachment. You simply have to have a plan based on the most likely scenario.

If the silicone oil is coming out, that is good news for the patient and for the surgeon. In this scenario, set your biometer of choice to silicone oil mode when you are measuring the eye. This will give you an accurate measurement of the axial length, as it automatically adjusts for the refractive index difference between vitreous and silicone oil in the vitreous cavity. With an accurate measuring of the axial length and a plan for the silicone oil to be removed, the lens that is chosen by your standard formula should be accurate.

However, if the silicone oil is staying inside the eye, the lens calculation is not going to be accurate. You still need to measure in silicone oil mode, but what I think is poorly understood by many ophthalmologists (including myself for a long time) is that the silicone oil affects IOL selection. The refractive index of silicone oil is 1.41 on average, and the IOLs that we use are about 1.47. Because there is almost no difference in the refractive index between the two materials, the back half of the lens is effectively nullified, providing almost no refractive power.

In order to properly calculate the IOL, you need to know how the

power of the lens is split between the front and back surface. For equiconvex lenses, the front and back surfaces provide the same power. Here is an example. If you have a patient with a predicted IOL power of 20 D, if it is an equiconvex lens, then that means half of the power is in the front of the lens of the optic and half the power is in the back. In this situation, the back 10 D is going to be nullified by the silicone oil. It is vital to compensate for this by adding power to the IOL. The basic rule of thumb is to add about 8 D for lenses 20 D or over. If the lens power is 15 D to 20 D, add 7 D, and from 10 D to 15 D, add 6 D. (These rules of thumb were given to me by Warren Hill, MD, through personal communication.) A lot of people do not understand that that compensation needs to take place, and they are commonly and drastically underpowering the IOL in eyes with silicone oil.

For more information:
Gary Wörtz, MD, can be reached at Commonwealth Eye Surgery, 2353 Alexandria Drive #260, Lexington, KY 40504; email: 2020md@gmail.com.

Read more about

ADD TOPIC TO EMAIL ALERTS