

Oil Droplets on an IOL

BY LISA B. ARBISSER, MD; NICK MAMALIS, MD; DEEPINDER K. DHALIWAL, MD;
AND CHRISTOPHER D. RIEMANN, MD

CASE PRESENTATION

An axial myope underwent uncomplicated cataract extraction and placement of a Crystalens AT-45 (Eyeonics, Inc., Aliso Viejo, CA) in each eye. A few months postoperatively, she developed a rhegmatogenous retinal detachment in her left eye that failed initial pars plana vitrectomy, capsulectomy, and gas-fluid exchange. Secondary repair successfully reattached her retina with silicone oil tamponade. Unfortunately, even after oilectomy, oil droplets adhered to the anterior and posterior surfaces of the IOL and could not be successfully aspirated. They have markedly reduced her BCVA and have left the patient quite dissatisfied with her vision, despite a healthy macula. How would you proceed?

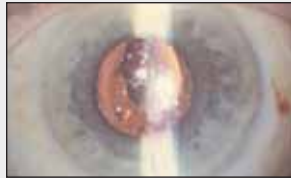


Figure 1. A slit-lamp examination shows silicone oil droplets on a Crystalens AT-45.

LISA B. ARBISSER, MD

One disadvantage of silicone IOLs is the known potential for decreased vision caused by the adherence of silicone oil droplets to the lens material. This unfortunate circumstance requires an exchange for an acrylic implant. Because this patient opted for (and paid for) presbyopic correction and she enjoys some degree of accommodation in her fellow eye, I would plan the exchange with a pseudoaccommodative or multifocal implant.

Surgery can be challenging in a vitrectomized eye, especially if the posterior capsule is breached. Maintaining the globe's shape and pressure promotes uncomplicated surgery, and, therefore, most maneuvers should be accomplished with a closed chamber.

I would use Healon GV or Healon 5 (both Advanced Medical Optics, Inc., Santa Ana, CA) to open the capsular bag through the original paracentesis. The integrity of the capsulorhexis must be protected, so I would insinuate a viscoanalostomy cannula on the viscoelastic syringe between the anterior surface of the IOL and the edge of the capsulorhexis. Gentle viscodissection would break adhesions between the lens or posterior capsule and the anterior capsulorhexis. I could then completely open the bag and atraumatically remove the Crystalens

through the original clear corneal incision.

My preference for this patient would be the single-piece Acrysof Restor lens (Alcon Laboratories, Inc., Fort Worth, TX). If I were unable to open the bag completely or if the posterior capsule were breached, however, I would place either the three-piece acrylic Acrysof Restor lens or the three-piece acrylic Rezoom lens (Advanced Medical Optics, Inc.) in the sulcus captured through the anterior capsulorhexis, if possible. I would not choose a Crystalens, because small amounts of residual silicone oil might still be present and coat the new lens.

Although I do not normally mix and match multifocal or accommodating IOL technologies, this patient's spectacle independence will be restored or even enhanced by this combination of IOLs.

NICK MAMALIS, MD

The Crystalens AT-45 has a silicone optic. Silicone oil attaches tightly to the surface of a silicone IOL and is very resistant to removal. This problem was described by Apple et al a decade ago.¹ The use of irrigation, ophthalmic viscosurgical devices, and simple aspiration is often unsuccessful in dislodging the oil from the surface of an IOL. Other proposed methods include the use of ultrasound to emulsify and aspirate the oil. In addition, solvents such as perfluorohexyloctane (F6H8) have been studied as a means of removing the silicone oil from the IOL.²

If the silicone oil cannot be removed from the IOL, explantation is often required.

The fact that this patient has needed silicone oil necessitates the use of an IOL for exchange that is not made of silicone. Hydrophobic acrylic IOLs have less of a problem with adherence of the silicone oil. Hydrophilic acrylic IOLs have been shown to have the least adherence of oil,³ but their availability in the US is limited at this time. The successful exchange of the silicone IOL should significantly improve this patient's vision.

DEEPINDER K. DHALIWAL, MD

This case is a sobering reminder that myopes (especially young ones) have much at stake when undergoing intraocular surgery. It is tempting to perform lens-based correction of high myopia, because the corneal optics are untouched, the quality of vision is high, and there is no

risk of ectasia. As this case demonstrates, however, short-term gain does not equal long-term happiness.

It is not surprising that the silicone oil is firmly adherent to the silicone optic of the Crystalens AT-45 IOL. If the retina surgeon could not successfully remove these droplets, one option to clear the visual axis is to explant the lens (after confirmation from the retina surgeon that there is no further risk to the retina). The cataract surgeon then needs to decide which IOL to insert. Because the patient's fellow eye has an accommodating IOL, it would be ideal to offer her a presbyopia-correcting lens. There is no accommodating IOL on an acrylic platform available in the US. Two multifocal lenses (the Acrysof Restor and Rezoom IOLs) have acrylic optics and are available in a three-piece design for implantation in the sulcus. It is stated that the patient's macula is healthy. If the macula had detached or there were subclinical cystoid macular edema, her visual function would be compromised, and she might not be satisfied with a multifocal IOL. In that case, a monofocal IOL might be the best option to optimize visual function.

CHRISTOPHER D. RIEMANN, MD

The problem of silicone oil's adherence to a silicone lens implant can certainly be profoundly vexing and is one of many reasons why many retinal surgeons (including myself) advise against placing a silicone lens implant in the first place. There are multiple equivalent IOLs not made of silicone available. For certain, any patient with a personal or family history suggesting a greater risk for posterior segment disease should never receive a silicone PCIOL.

One alternative to explanting a silicone PCIOL that has become optically compromised by adherent silicone oil involves creating an optically clear zone in the center of the implant with a jet of balanced salt solution. I developed this technique to allow adequate visualization of the posterior segment for the efficient repair of a rhegmatogenous retinal detachment. Often, these eyes are quite diseased and have been operated on multiple times. A less invasive, more microincisional approach is therefore preferred.

The technique, which I call the *hydraulic squeegee*, involves placing a nearly 90° bend at the very end of a 27- or 30-gauge cannula. The modified instrument is placed through the 25- or 23-gauge vitrectomy trocar (or 20-gauge sclerotomy). After placing the cannula's tip against the center of the IOL's optical axis, I use a forceful, but well-aimed and controlled, jet of balanced salt solution to displace the oil toward the periphery of the IOL in much the same way that a car wash's air dryer pushes water up the windshield of a car. The displaced oil does not migrate again into the optical center, and adequate visualization is achieved. Of course, great care must be taken to ensure that the jet of fluid remains directed only at the IOL to

avoid damage to the ocular tissues. The same technique can then be carefully applied to the anterior surface of the IOL through a paracentesis, if necessary. Prior to performing this maneuver in the anterior chamber, one must protect the cornea with a dispersive viscoelastic.

An alternate technique for manipulating silicone oil on an IOL involves using an improvised "silicone sweeper." Either the Tano Diamond Dusted Membrane Scraper or a silicone soft-tipped cannula (both from Synergetics, Inc., O'Fallon, MO) will engage the silicone oil in much the same way that the silicone PCIOL does, so small amounts of oil can be manipulated. Often, this technique becomes tedious in a hurry, and I resort to the much more effective hydraulic squeegee. ■

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