

IOL OPACIFICATION



In cases of decreased vision due to IOL calcification, explantation is typically the best route.

BY JACOB LANG, OD, FAAO, DIPL ABO

A new patient presented to my clinic complaining of decreased vision in his right eye (Figure). His VA was 20/50 OD and he reported an ocular history of cataract surgery in each eye and uneventful Nd:YAG laser capsulotomy in each eye. The patient requested “another laser to polish up my implants;” however, there was a little more to the story this time.

IOL OPACIFICATION

IOL opacification occurs when deposits of calcium accumulate on the surface of an IOL and/or within the lens itself, not to be confused with *posterior capsular opacification*, in which cloudy scar tissue forms behind the lens. Calcium bicarbonate (CaHPO_4) and hydroxyapatite ($\text{Ca}_5(\text{PO}_4)_3(\text{OH})$) are thought to be the most common complexes that create opacification.^{1,2} Protein precipitates may also be involved, but to a lesser degree.² Vision may be affected, depending on the amount and location of the deposits.

Because these deposits reside not only on, but also within the IOL itself, laser treatment has little effect and may even worsen symptoms by further disrupting the IOL.¹ IOL exchange is the preferred method of managing IOL opacification.¹⁻³

CAUSE FOR EXPLANTATION

There are a multitude of reasons for explanting an IOL. A recent study reviewed 257 explanted pseudophakic IOLs, with the main causes being dislocation or decentration (56.3%), incorrect lens power (12.8%), neuroadaptation failure (6.2%), pseudophakic bullous keratopathy (2.3%), and endophthalmitis (1.9%).¹ The authors concluded that IOL opacification was the third most frequent reason for IOL explantation (11.3%).¹

IOL calcification is categorized as either primary or secondary.¹ Primary calcification describes a problem regarding the IOL itself (eg, manufacturing or handling), whereas

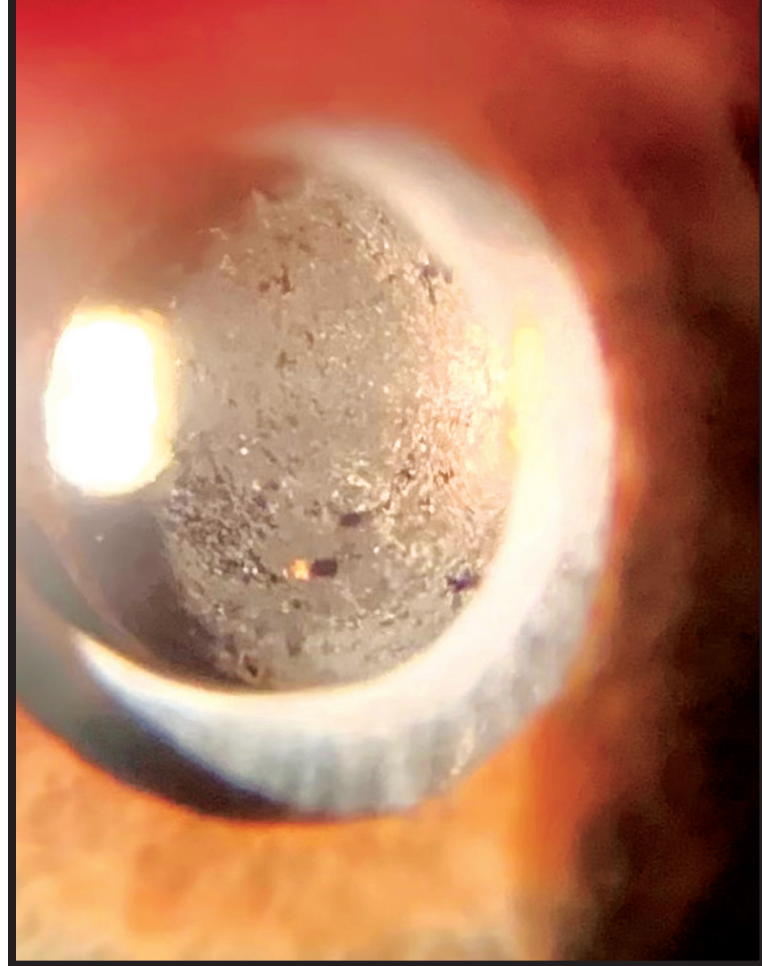


Figure. Posterior calcification of an IOL.

secondary calcification refers to calcification that occurs as a result of the surgical and ocular environment.^{1,3}

As is the case with most pathologies, it is unlikely that there is a single causative mechanism behind IOL calcification.¹ Risk factors appear to include the use of intraocular gas in cases of endothelial keratoplasty or vitreoretinal surgery, the retention of viscoelastic, and the use of mitomycin C during trabeculectomy surgery.^{1,3} In some cases, no specific risk factor can be identified.^{1,3} The breakdown of the blood–ocular barrier from multiple intraocular procedures or from systemic conditions, such as diabetes, appears to increase the risk of calcification as well.¹⁻³ Patients with diabetic retinopathy typically have high aqueous humor calcium concentrations, which may contribute to IOL opacification in this population.¹ ■

1. Fernández J, Sánchez-García A, Rodríguez-Vallejo M, Piñero DP. Systematic review of potential causes of intraocular lens opacification. *Clin Exp Ophthalmol*. 2020;48(1):89–97.

2. Mackert M, Muth DR, Vounotrypidis E, et al. Analysis of opacification patterns in intraocular lenses (IOL). *BMJ Open Ophthalmol*. 2021;6(1):e000589.

3. Darcy K, Apel A, Donaldson M, et al. Calcification of hydrophilic acrylic intraocular lenses following secondary surgical procedures in the anterior and posterior segments. *Br J Ophthalmol*. 2019;103(12):1700–1703.

JACOB LANG, OD, FAAO, DIPL ABO

- Associated Eye Care, Stillwater, Minnesota
- Member, *Modern Optometry* Editorial Advisory Board
- drjakelang@gmail.com; Instagram @seeoneteachone
- Financial disclosure: None