

RETAINED LENS FRAGMENTS: NOW WHAT?



Early vitrectomy may not be the best course of action.

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Posterior dislocation of lens fragments is a complication of cataract surgery with a reported incidence of 0.2% to 1.5%.¹

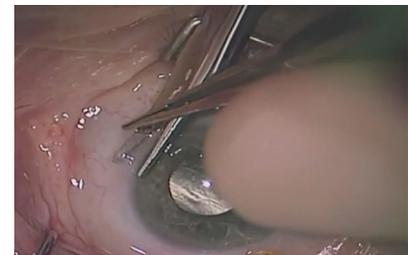
Although it is infrequent, the secondary effects of this event can have long-term visual consequences, including permanent vision loss.¹ Surgical volume and surgeon experience may be factors in how frequently this complication occurs. In one retrospective trial, the incidence was 0.2% among experienced attending surgeons (judged subjectively) and 0.6% among inexperienced residents and fellows.²

The need to understand and adapt to nonuniform and location-specific lens and capsular anatomy

and correlated characteristics may play a role in dislocation of lens fragments. Risk factors for capsular rupture include increased lens density; poor pupillary response to mydriatic medications; preexisting anatomic variations such as physiologic enophthalmos; and systemic conditions such as exfoliation syndrome, trauma, or Marfan syndrome. Informed consent should include a discussion of these risk factors with patients prior to surgery.

When the lens capsule is violated and lens fragments fall into the vitreous, cystoid macular edema, retinal detachment, ocular hypertension, infection, and rigorous granulomatous inflammation can occur.³ Some of these phenomena cause

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decompensation of other ocular tissues, potentially leading to compromise of corneal clarity, conjunctival hyperemia, tearing, and eyelid edema.

Given the rarity of these events, surgeons may not know the best steps to take concerning recovery and timing of referral to a vitreoretinal specialist. This article aims to provide guidance to anterior segment surgeons regarding the timing of referral and appropriate management prior to transition of care.

AT A GLANCE

- ▶ When the capsule is violated and lens fragments fall into the vitreous, cystoid macular edema, retinal detachment, ocular hypertension, infection, and severe granulomatous inflammation can occur.
- ▶ It is useful to take note of the size and quality of lens material that remains within the eye, particularly if it includes any nuclear material.
- ▶ The definitive therapy for retained lens fragments is pars plana vitrectomy; however, medical management may be sufficient, depending on the size and burden of the retained lens fragments.

INTRAOPERATIVE MANAGEMENT

Intraoperative management of retained lens fragments is one key to achieving successful outcomes. Recognizing capsular rupture and the entry of vitreous into the anterior segment is the first step. Anterior vitrectomy with the aid of triamcinolone acetate can be performed to identify and remove vitreous fibers. If anterior vitreous is not adequately removed, vision-threatening

complications can occur. These include endophthalmitis due to external communication through surgical wounds and retinal tears and detachment due to tension on the retina.

If possible, placing a secondary IOL (eg, three-piece implant in the sulcus or anterior chamber lens) can be helpful; however, this step should be less of a priority, as a secondary IOL can be implanted later to correct the patient's aphakia.

It is useful to take note of the size and quality of the lens material that remains within the eye, particularly if it includes any nuclear material. This knowledge will help guide the duration of postoperative medical management and determine the urgency of a secondary surgical procedure.

POSTOPERATIVE MANAGEMENT

After cataract surgery, IOP is usually elevated due to inflammation and obstruction of the trabecular meshwork by lens particulates, by OVD, or, later, potentially by corticosteroids. In addition to antiinfective medications, the use of rigorous antiinflammatory and IOP-lowering medications should be considered and delivered early. One should always consider early oral IOP-lowering therapy, depending on the circumstances.

The definitive therapy for retained lens fragments is pars plana vitrectomy

RISK FACTORS FOR CAPSULAR RUPTURE

- Increased lens density
- Poor pupillary response to mydriatic medications
- Preexisting anatomic variations (eg, physiologic enophthalmos)
- Systemic conditions (eg, exfoliation syndrome, trauma, or Marfan syndrome)

(PPV); however, medical management may be sufficient, depending on the size and burden of the retained lens fragments.⁴ Generally, patients appear sickly relative to their uncomplicated counterparts, and it can be tempting to refer to a vitreo-retinal specialist soon after surgery, even the same day.

TIMING OF VITRECTOMY

The timing of PPV has been a topic of debate among vitreoretinal surgeons for decades, and the discussion is ever-changing due to new developments in surgical technology. With the evolution of 23-, 25-, and 27-gauge vitrectomy systems, surgeons have become more comfortable performing vitrectomy for all indications.

Historically, PPV to remove lens fragments has been performed soon after complicated cataract surgery.⁵ Some have advocated same-day vitrectomy, and this thought has likely become the first instinct among anterior segment surgeons, who often request same-day

surgical intervention. Nevertheless, lens particulates present a unique challenge, as their removal may require the use of a fragmatome. Because of the size of these devices, this option requires creation of a 20-gauge sclerotomy, which can be cumbersome. Its scleral wound can lead to iatrogenic retinal detachment. Use of the fragmatome to bring lens particles to the tip of its needle may also cause iatrogenic injury due to mobile lens particulates making frequent contact with retinal tissues or direct tissue injury by the device (bit.ly/oakey0518). Therefore, judicious decision-making and consultation of published evidence are key.

No randomized trials evaluating the timing of PPV have been published, although numerous case series have. Further, no comparative trial has been conducted comparing long-term medical management with surgical management. Conflicting and underpowered data supporting both early^{6,7} and delayed⁸⁻¹⁰ surgical management can be found.

One metaanalysis gathered data from studies published from 1977 through 2008 and included 2,380 eyes with a mean 6 years of follow-up.¹¹ The authors stratified patients into two arbitrary time categories (0–2 days and 3–7 days) and made statistical comparisons. They found that there was a significant difference in final vision between the two groups favoring later PPV, in the 3-to-7-days category. Not only were visual acuity outcomes better in the delayed surgery group, but also the rates of complications, including retinal detachment, ocular hypertension, cystoid macular edema, and corneal edema, were lower.

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FRAGMENTS MAY BE PART OF A LARGER TREND TOWARD

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Although not a scientific exercise, it is impressive to find that this metaanalysis identified what seem to be more numerous publications in support of delayed PPV than early PPV.¹¹ Anecdotal claims regarding corneal clarity, surgeon experience, and expert opinion also seem to support later surgical intervention.

CONCLUSION

Anticipating and treating complications of cataract surgery requires a unique and cautious approach. Although early surgery for retained lens fragments may be part of a larger trend toward early intervention in vitreoretinal surgery in general, early PPV may not be the ideal course of action in these cases. Proper medical management prior to referral is a key component to obtaining the best final visual results. Further efforts to initiate a randomized trial to identify the best strategy or strategies should be pursued. ■

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