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Case report

Fibrotic cataract as a sign of posterior capsule violation post vitrectomy

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ABSTRACT

Purpose: To report fibrotic cataract as a sign of posterior capsule violation post vitrectomy.

Observations: A 16 year old female presented to our retina clinic after multiple prior vitrectomies at an outside hospital for traumatic retinal detachment. On presentation, it was noted that she still had a silicone oil inside the eye, and a dense, fibrotic cataract limiting the posterior pole view. The decision was made to pursue cataract phacoemulsification plus silicone oil removal. We utilized the Zepto capsulotomy system given the white cataract. After gentle bimanual irrigation and aspiration of the cataract, it was discovered there were two small, round, posterior capsule defects with fibrosis around these holes that extended anteriorly, involving the capsular fornix and anterior capsule. This was confirmed intraoperatively on heads-up OCT. A three-piece intraocular lens was placed into the capsular bag, but given the contracted capsular fornix, the IOL was decentered inferonasally, so it was repositioned in the sulcus with good centration.

Conclusions: It is known that pars plana vitrectomy leads to accelerated cataract formation postoperatively. This case report is the first to our knowledge that describes a fibrotic cataract as a sign of posterior capsular violation.

Importance: We demonstrate that presence of fibrotic cataract post vitrectomy should raise suspicion for capsular violation and should prompt further discussion with the patient regarding appropriate surgical planning and expectations.

1. Introduction

Multiple studies have demonstrated that 60–98% of older patients develop a cataract within two years following pars plana vitrectomy.^{1–3} The most common cataract to form is nuclear sclerosis, with posterior subcapsular cataracts also commonly found.^{1,4} Herein, we detail a report of a patient presenting with a fibrotic cataract following a pars plana vitrectomy for retinal detachment. Intraoperatively, there was evidence of posterior capsule violation from the initial retinal surgery. No such other reports of a fibrotic cataract as a sign of iatrogenic capsular violation exist in the known literature.

2. Case report

A 16-year-old female presented to our emergency room for decreased vision in the left eye. She had a past ocular history of traumatic retinal detachment of the left eye treated with multiple vitrectomies in Colombia over a 1–2 year time frame prior to presentation and surgery

with our service. The emergency room determined her decreased vision was secondary to a new cataract in the left eye, and she was referred to our clinic.

On initial evaluation, visual acuity in the left eye was hand motion with and without correction and intraocular pressure was 12 by non-contact tonometry. Her exam demonstrated a white cataract in the left eye with a poor view posteriorly. Initial ocular ultrasound showed a slightly enlarged globe due to intraocular silicone oil, with the retina grossly attached. The decision was made to remove the silicone oil in combination with cataract surgery.

During surgery, trocars were first placed in the inferotemporal, superotemporal, and superonasal quadrants. The Zepto capsulotomy system (Centricity Vision, Carlsbad, CA) was employed given the fibrotic appearing cataract (Fig. 1). Immediately after energy was applied, it was noted that the capsulotomy was larger than the reported average 5.0 mm capsulotomy produced using the Zepto capsulotomy system.⁵ This was presumed to be due to release of significant contracture of the anterior capsule centrally. Additionally, the anterior capsule was visibly

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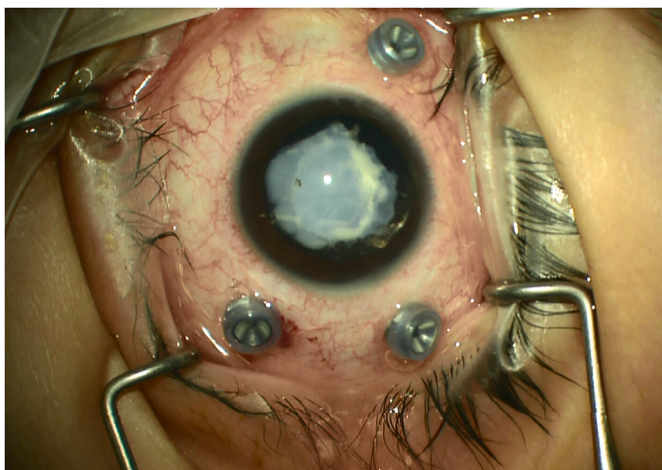


Fig. 1. Fibrotic anterior capsule.

adherent to the underlying lens in the superotemporal quadrant over the area of densest fibrosis. The fibrosis was lysed using intraocular scissors and forceps (MicroSurgical Instruments, Redmond, WA). Hydrodissection was avoided since the cataract was fibrotic and the status of the posterior capsule was unknown. Bimanual irrigation/aspiration was performed to remove the chalky cataract fragments. As the case progressed, it was noted that the fibrotic cortical material was emanating from the superotemporal quadrant. After careful examination, two small, round posterior capsule defects with fibrotic material surrounding them were discovered through which silicone oil was emanating forward into the capsular bag (Fig. 2). Intraoperative heads-up OCT (Carl Zeiss Calisto, Oberkochen, Germany) was utilized to verify that the fibrotic material originated at these two posterior capsule defects and wrapped anteriorly around the capsular fornix and onto the anterior capsule (Fig. 3).

The remaining cataract removal proceeded without issue. Although there were posterior capsular violations, they appeared stable, and a three-piece lens was successfully positioned in the capsular bag. However, given the significant amount of fibrosis and contracture of the capsular fornix, tension on the haptics resulted in inferonasal lens displacement (Fig. 4). Because of this, the lens was repositioned into the sulcus with excellent centration (Fig. 5).

After the silicone oil was removed, it was discovered the inferior retina, including the macula, was detached and proliferative vitreoretinopathy grade C-2 was present. A limited posterior capsulotomy, starting from the previously described posterior capsular defects, was

performed with the vitrectomy probe to clear the visual axis. An inferior retinectomy was required to relieve traction from long standing proliferative membranes. Perfluorocarbon was instilled into the eye, and the retina was found to lay flat. Endolaser was applied to the borders of the retinectomy. An air-fluid followed by air-perfluoron exchange was performed, and then eye was then refilled with silicone oil for continued endotamponade.

Postoperatively, her vision improved to count fingers in the left eye. The patient and her family were been counseled extensively regarding the poor visual prognosis given the severity of the retina pathology.

3. Discussion

Cataract development or progression after vitrectomy is expected. Previous reports have noted white cataracts after vitrectomy, which can be a sign of lens touch, possible posterior capsular violation, or less commonly, longstanding silicone oil endotamponade.⁶ Although it is more common to have nuclear sclerosis or posterior subcapsular cataract progression/formation after prolonged silicone oil endotamponade, fibrotic cataracts can occur.⁷⁻⁹ It is thought that this formation is similar to peri-silicone proliferation where an inflammatory milieu in response to the silicone oil leads to fibrosis, but the literature is lacking detailed reports on this phenomenon.^{10,11}

This is the first report in the available literature of a fibrotic cataract as a sign of posterior capsule violation after pars plana vitrectomy. In this case, the patient was unknown to our institution and had surgery in a different country. Access to the operative report was not possible. Additionally, by the time she presented to our institution, her cataract was already white and fibrotic in nature, with no view to the posterior capsule, making it impossible to know definitively whether or not there was capsular violation. Intraoperative heads-up OCT provided confirmation that the fibrosis originated from the posterior capsule defects and wrapped anteriorly towards the capsular fornix and anterior capsule.

Another interesting aspect of this case was the capsular bag contracture. This effect was not noted until after Zepto capsulotomy, which allowed the capsular bag to relax. Similarly, this contracture effect also caused the capsular bag to be fibrotic with a reduced capsular fornix superotemporally, preventing proper centration of the three-piece IOL in the capsular bag.

4. Conclusions

It is commonplace and expected to develop a cataract after pars plana vitrectomy. Traditionally, quickly forming white cataracts can present after pars plana vitrectomy and are a sign of capsular trauma or

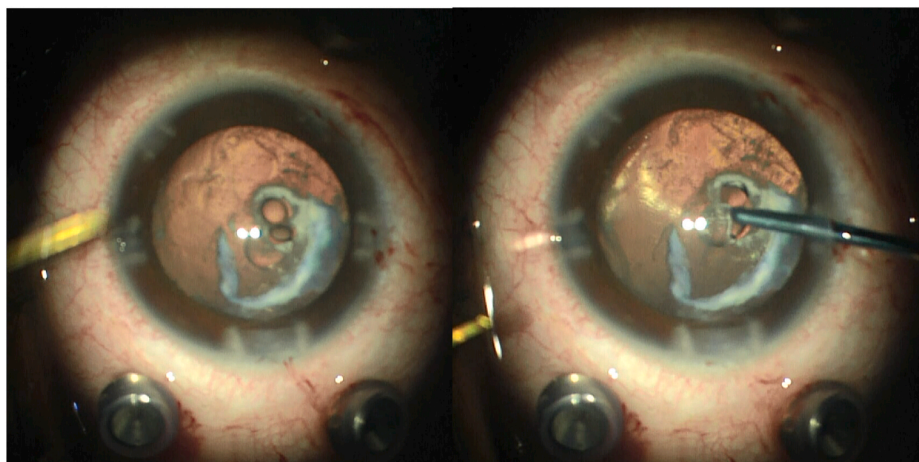


Fig. 2. Silicone oil coming forward through two posterior capsule defects.

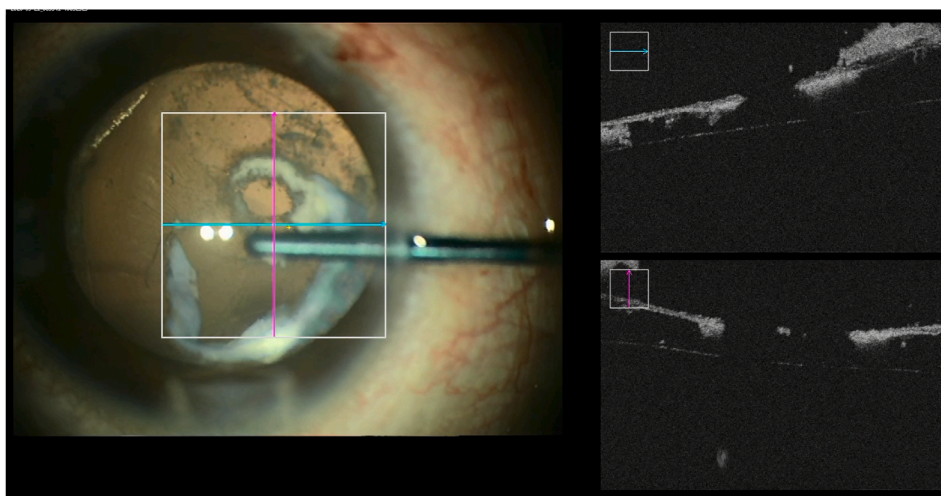


Fig. 3. Heads-up OCT demonstrating a posterior capsule break with fibrotic material.

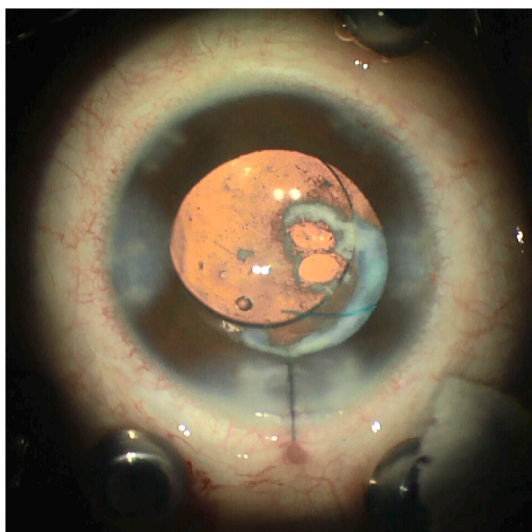


Fig. 4. Inferiorly dislocated three-piece IOL with haptics in the capsular bag.

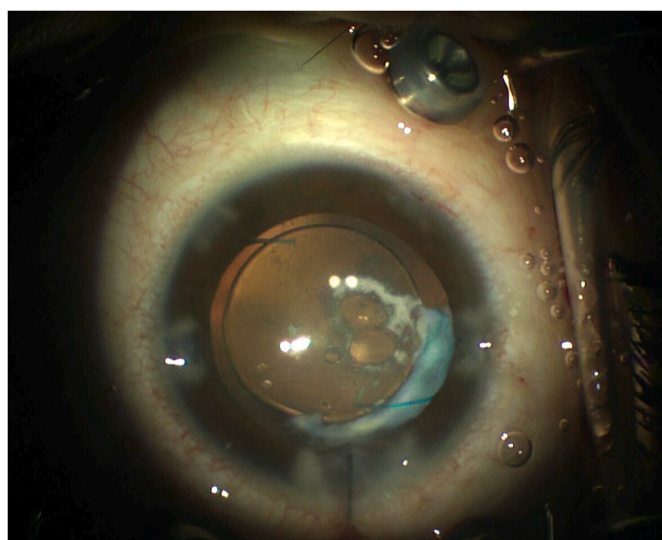


Fig. 5. Well-centered three-piece IOL with haptics in the sulcus.

violation. We add to this literature by showing that a fibrotic cataract should raise suspicion for a similar capsular violation, preoperative discussion with the patient should include capsular support issues and IOL placement, and capsular violation should be included in the surgical planning of white fibrotic cataracts following pars plana vitrectomy.

Author declaration

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Potential conflict of interest exists:

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Cristos Ifantides is a consultant for Centricity Vision, the maker of Zepto Capsulotomy system.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.ajoc.2021.101155>.

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