Endophthalmitis Associated with a Retained Cilium in the Clear Corneal Wound after Cataract Surgery

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Abstract
We report a case of endophthalmitis occurring secondary to a retained cilium in a clear corneal wound after cataract surgery. A 67-year-old female presented to an ophthalmology emergency room with light perception vision in the right eye 5 days after routine cataract surgery. Examination of the right eye demonstrated decreased vision, conjunctival injection, a corneal endoplaque, and anterior chamber fibrin. Additionally, a cilium was visible in the clear corneal incision. A vitreous aspiration and injection of antibiotics and steroid were performed, and the patient underwent a vitrectomy the next day. Intraoperative cultures and culture of the cilium grew Staphylococcus epidermidis. One year after vitrectomy, the patient’s vision recovered to 20/25 in the operated eye. In conclusion, a retained cilium in a clear corneal wound related to cataract surgery, though rare, may result in endophthalmitis. The surgical field should be cleared of cilia on the ocular surface prior to surgery. Proper draping and use of povidone-iodine antisepsis are essential in reducing the risk of endophthalmitis.

Introduction

Although rare, endophthalmitis is one of the most feared complications after cataract surgery. Reported rates in the literature vary; a study utilizing the Intelligent in Research Site (IRIS) database found the rate of endophthalmitis in the USA to be 0.04% [1].
The ocular adnexa, including the eyelashes, are thought to be an important source of flora leading to exogenous endophthalmitis after intraocular procedures including cataract surgery. Steps taken prior to cataract surgery to reduce the risk of endophthalmitis include meticulous draping of the eyelashes to divert the eyelashes from the surgical field as well as cleaning the ocular surface and adnexa with povidone-iodine [2].

Prior reports have documented cases of intraocular eyelashes associated with endophthalmitis [3, 4]. Herein, we report a case of exogenous endophthalmitis after cataract surgery associated with an eyelash retained in the clear corneal cataract wound.

Case Report

A 67-year-old female presented to the Bascom Palmer Eye Institute Emergency room with decreased vision in her right eye. The patient noted she had had uncomplicated cataract surgery in her right eye 5 days prior to presentation with an outside provider. Three days after her cataract surgery, she noted pain in the operated eye with an associated decrease in her vision.

At presentation, vision in the right eye (OD) was light perception and 20/30 in the left eye (OS). The intraocular pressure was 32 OD and 18 OS. Examination demonstrated diffuse injection OD with a 2.5 mm hypopyon, a pupillary fibrin membrane, and a large corneal endoplaque. A retained eyelash was seen in a temporal clear corneal cataract wound extending from the anterior chamber to the ocular surface (Fig. 1). The wound was Seidel negative.

There was no view to the posterior pole in the right eye secondary to fibrin deposited on the anterior surface of the intraocular lens implant. B-scan ultrasonography demonstrated dense vitreous opacities in the right eye (Fig. 2). Examination of the left eye was unremarkable.

Fig. 1. Slit lamp photograph of the right eye demonstrating a retained cilium (arrow) in a clear corneal incision after phacoemulsification. Additionally, there was conjunctival injection, diffuse stromal edema, and an inferior corneal endoplaque (white asterisk).
The retained eyelash was removed and sent for culture along with a vitreous sample. Intravitreal injections of vancomycin (1 mg), ceftazidime (2.25 mg), and dexamethasone (0.4 mg) were performed. The patient was started on hourly fortified vancomycin and tobramycin eye drops and was scheduled for a pars plana vitrectomy the next morning.

Intraoperatively, a nondilute vitreous sample was taken. Subsequently, the anterior chamber was washed out. A 25-gauge pars plana vitrectomy was performed with careful attention to avoid inducing iatrogenic retinal breaks by performing a limited vitrectomy in the setting of difficult visualization. A partial (50%) fluid-air exchange was performed, and intravitreal vancomycin and ceftazidime were injected. Vitreous cultures and culture of the retained cilium both returned positive for pan-susceptible *Staphylococcus epidermidis*.

One week postoperatively, the patient’s vision improved to 4’/200E OD with an intraocular pressure of 15. The hypopyon and fibrin resolved. One month later, vision improved to 20/100 OD and the anterior chamber was quiet. Six months postoperatively, the patient’s best-corrected visual acuity improved to 20/25 in her right eye.

**Discussion**

According to a review of reported cases in the literature, intraocular cilia most commonly occur after cataract surgery [5, 6] or penetrating ocular trauma [7, 8]. As previous cases have demonstrated, intraocular cilia can remain inert for many years [9]. However, intraocular cilia have also been associated with severe complications including endophthalmitis [3, 4].

This patient is the first reported case of endophthalmitis associated with an entrapped cilium in a clear corneal wound after cataract surgery. Prior cases have reported migration of cilia into clear corneal incisions after cataract surgery [10, 11]. However, in those cases the cilia were removed without reported cases of endophthalmitis. The patient in this report denied eye rubbing, which might have caused the cilium to migrate to the wound. This is of particular importance in the presence of temporal corneal wounds, which may gape more easily than superior wounds with eye rubbing.

Common bacterial flora colonizing the eyelids and eyelashes include *Staphylococcus, Streptococcus, Corynebacterium*, and *Propionibacterium* [12]. In the present case, both intraoperative cultures and culture of the retained cilium were positive for *Staphylococcus epidermidis*.

Clinical signs and symptoms of endophthalmitis after cataract surgery include decreased vision postoperatively, pain, fibrin in the anterior chamber, and the presence of hypopyon.
These features should alert ophthalmologists to the possibility of postoperative endophthalmitis. In the present case, the decision to proceed promptly to the operating room was made based on the patient’s presenting visual acuity of light perception. The Endophthalmitis Vitrectomy Study demonstrated statistically significant improved visual recovery in cases of endophthalmitis after cataract surgery among patients receiving immediate pars plana vitrectomy relative to intravitreal antibiotics without vitrectomy [13]. The patient in the current report ultimately had near-complete recovery of visual acuity, reaching 20/25 1 year after presentation.

Preparation of the surgical field prior to cataract surgery is of utmost importance in the prevention of endophthalmitis. Important considerations include treatment of blepharitis prior to surgery, the use of topical povidone-iodine to the ocular surface and adnexa, and the use of drapes to keep lashes out of contact with the surgical field [14, 15]. Postoperatively, all surgical wounds should be examined at the conclusion of cataract surgery. In summary, the present case is the first reported case of endophthalmitis associated with entrapment of a cilium in a clear corneal wound after cataract surgery.

Statement of Ethics

The present work was conducted in accordance with the Declaration of Helsinki. The Institutional Review Board at the University of Miami granted the present study an exemption as the study did not meet its definition of research. Written informed consent was obtained from the patient for publication of the details of their medical case and any accompanying images.

Conflict of Interest Statement

None of the authors report any financial disclosures or conflicts of interest related to the present work.

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Author Contributions

H.A., N.L.S., and H.W.F. were involved in conception and design, drafting, and editing of the manuscript.

Data Availability Statement

All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author.
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