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Case Report

A Case of Intraocular Cilium after 25-Gauge Micro-Incision Vitrectomy Surgery

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Keywords

Intraocular cilium · Micro-incision vitrectomy surgery · The wide-angle viewing system

Abstract

We report a case of intraocular cilium after micro-incision vitrectomy surgery for retinal detachment. A 61-year-old male underwent vitrectomy with cataract surgery for rhegmatogenous retinal detachment. The postoperative course was generally good with no re-detachment, but on examination 3 months later, a cilium was observed on the retina above the fundus. After discussing with the patient, it was decided to take no immediate action and just continuously monitor the patient in order to detect if there was worsening of any of the symptoms. The present case report suggests that foreign bodies such as cilium may stray into the eye through trocar even during vitrectomy. One of the possible causes was the risk of the noncontact wide-angle viewing system.

Introduction

Although intraocular cilium cases are considered to be rare, there have been some reports of this occurring after surgery or a penetrating injury [1–9]. The effects of cilium on the eye vary widely, ranging from asymptomatic to serious complications, such as causing a decrease in the visual acuity, endophthalmitis, corneal decompensation, and retinal detachment [6, 8, 10–14]. While surgically initiated cases have been reported to occur primarily after cataract surgery, there have yet to be any reports of occurrences after micro-incision vitrectomy surgery (MIVS) in cases other than for penetrating injury [8, 15, 16]. This report presents information on a case in which a surgeon performing a vitrectomy for retinal detachment

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unintentionally overlooked a cilium that had strayed into the vitreous cavity via a trocar used during the procedure.

Case Report

A 61-year-old man underwent 25-G MIVS using the Constellation vitrectomy system (Alcon, Inc., Hünenberg, Switzerland) in addition to cataract surgery for rhegmatogenous retinal detachment. After disinfection with iodine, a sterile perforated cloth was placed over the operative eye. Draping was performed by centrifugally pulling the skin of the upper and lower eyelids with sterile tape to open the eyelids while exfoliating the eyelashes and then applying clear cellophane to cover almost all of the meibomian glands and to secure the eyelashes so that they do not affect the operative field. A 25-G trocar and infusion cannula were inserted following sub-Tenon's anesthesia and a routine phacoemulsification and intraocular lens implantation. After administration of intravitreal triamcinolone, the patient underwent a 3-port system consisting of a contact prism lens, core, and peripheral vitrectomy. As macular detachment was observed prior to the surgery, internal limiting membrane peeling was also performed. In order to relieve the tractional forces on the peripheral retina and retinal breaks, the patient additionally underwent careful scleral depression. Subretinal fluid was drained using fluid-air exchange with an extrusion needle and active suction. After performing endolaser retinopexy around all of the retinal breaks, 20% sulfur hexafluoride was used to replace the air in the vitreous cavity. At the completion of all of the procedures, the patient assumed a face-down position over a period of 7 days after surgery. Postoperatively, eyedrops that included new quinolone antibiotics, steroids, and nonsteroidal anti-inflammatory drugs were administered in the patient.

No serious complications such as macular edema, inflammation, infection, or retinal detachment recurrence were observed during the postoperative course. A cilium was observed just above the fundus on the retina during the third month postoperative examination (Fig. 1). No subjective symptoms, such as myodesopsia, were observed and the cilium was found to move on the retina in conjunction with eye movement. After discussing the findings with the patient and his family, it was decided to take no immediate action and just continuously monitor the patient in order to detect if there was worsening of any of the symptoms.

During a later examination of the surgical video taken during the procedure, the images showed that the cilium had been caught in the trocar during the fluid-air exchange. Unfortunately, when the laser and light probes were inserted and subsequently removed, the surgeon did not notice the presence of the cilium (Fig. 2). As a result, this led to the cilium straying into the eye, without it being observed at the fundus during the initial procedure.

Discussion

While intraocular cilium can be commonly found in the anterior segment of the eye, cilium presence in the fundus is rare [3, 9, 17]. Although traumatic processes can be associated with cilium straying into the eye, it is not commonly thought that cilium will enter the eye intraoperatively but rather will postoperatively enter through the corneal incision during the time that the wound is healing [4, 15, 16]. In our present case, unbeknownst to the surgeon, the cilium gained entry via the trocar utilized for the vitrectomy. During our postoperative verification, our data additionally appeared to suggest that there could be a risk of this occurring in conjunction with the Resight system (Carl Zeiss Meditec AG, Jena, Germany).

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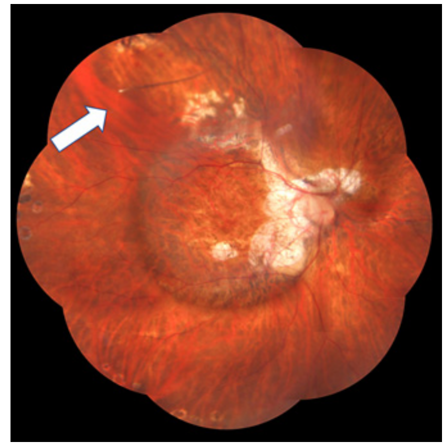

Fig. 1. Panoramic color fundus photograph of the right eye after 3 months later from surgery. A cilium was observed just above the fundus on the retina (white arrow).

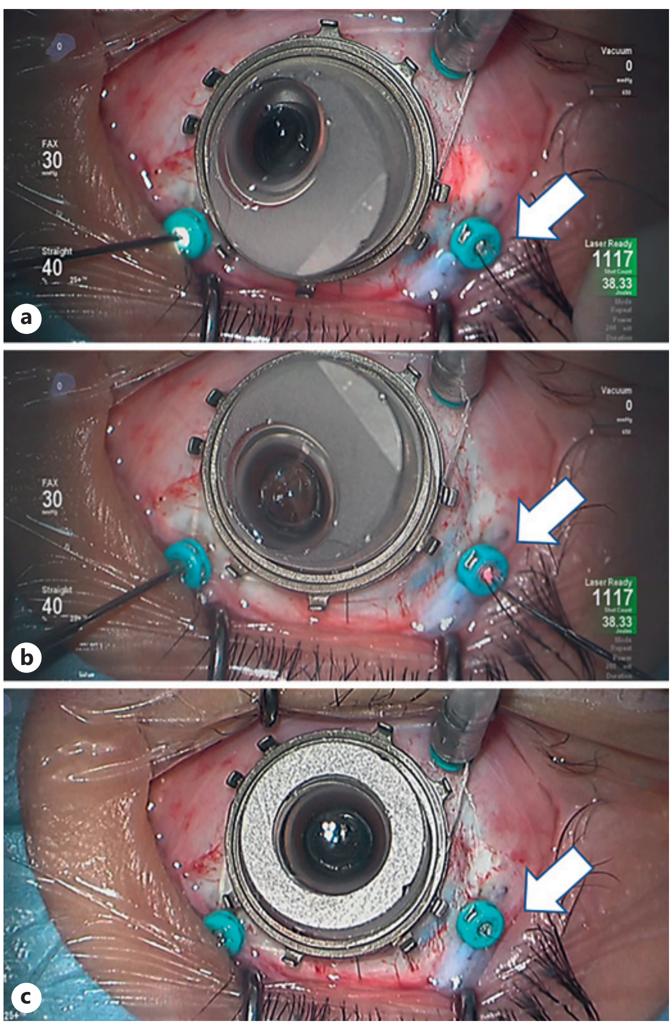

Fig. 2. **a** A cilium had been caught in the trocar during the fluid-air exchange (white arrow). **b** When the laser probe was inserted and subsequently removed, the surgeon did not notice the presence of the cilium (white arrow). **c** As a result, the cilium was led to stray into the eye gradually (white arrow).

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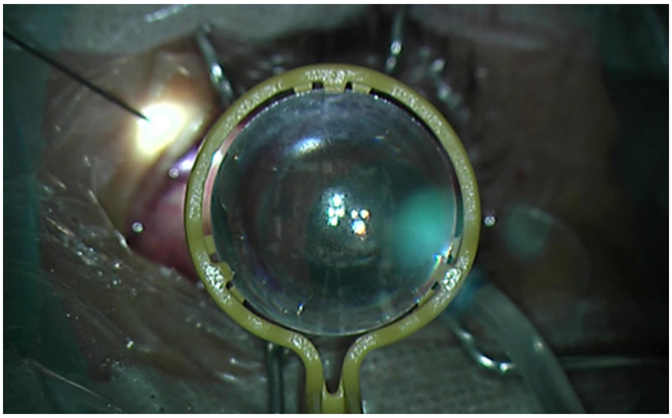

Fig. 3. Reference image of a microscope image during Resight use. It can be difficult to insert instruments with the front lens in place under a microscope as the image outside the lens is inverted and out of focus.

There has been a continuous development of wide-angle viewing systems (WAVSs) in order to achieve both a direct panoramic and clear view of the fundus, which improves both surgical efficiency and safety. One of the noncontact sutureless WAVS is the Resight system, which has an inner focusing mechanism that works by moving the reduction lens up and down [18]. The viewing angle can be adjusted by the surgeons without directly moving the microscope by changing the distance between the front lens and the corneal surface. It has been suggested by some reports that shorter operation times and improved surgical outcomes can be achieved by the use of a noncontact WAVS, such as the Resight system, which provides better fundus visibility including the peripheral areas with eye rotation [19, 20].

Since the front lens in the noncontact WAVS provides an inverted image of the fundus, a mechanism is required that will internally change the image back [21]. As the Resight system internally inverts the image, this will provide a clear fundus image. However, it can be difficult to insert instruments with the front lens in place under a microscope as the image outside the lens is inverted and out of focus (Fig. 3). Thus, this has to be performed while under direct vision. In the present case, due to the available equipment, a contact prism lens was used. Furthermore, since the Resight system had been commonly used by the surgeon in the past to insert or remove the instrument while under direct vision, our current results suggest that the surgeon likely did not notice the cilium caught in the trocar during the procedure, even though it was visible in the recordings made at the time of the surgery.

Although we are not aware of other reports of cilium straying into the eye after MIVS, the surgical video in this case does document the intraoperative straying that occurred during the procedure. Furthermore, our current findings demonstrate the potential for surgeons to overlook these types of issues, in addition to highlighting the risks that can be associated with the use of noncontact WAVS, including the Resight system. Overall, these findings underscore the fact that surgeons need to continue to approach these types of surgery with caution as the straying of foreign bodies into the eye always remains a possibility. The CARE Checklist has been completed by the authors for this case report, attached as online supplementary material (for all online suppl. material, see www.karger.com/doi/10.1159/000528623).

Statement of Ethics

This case report was according to the tenets of the Declaration of Helsinki. The ethics approval for this report was not necessary on the basis of the ethical guidelines for medical and health research involving human subjects established by the Japanese Ministry of Education, Culture, Sports, Science, and Technology and the Ministry of Health, Labour and Welfare. 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

The authors have no conflicts of interest to declare.

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Author Contributions

Kaku Itoh designed the present study, revised it critically for important intellectual content, acquisition and interpretation of the data, and written and approved the final version of the manuscript.

Data Availability Statement

All data are included in this paper.

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