

A Case of Post-cataract Surgery Endophthalmitis Successfully Treated with Conservative Therapy

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Background: Postoperative endophthalmitis after cataract surgery often requires emergency surgery if caused by an infection. However, early reoperation after the surgery put a heavy mental burden on the patient. Here we report a relatively mild case of postoperative endophthalmitis in which emergency surgery was avoided through careful observation including gram stain and culture test.

Case: 87-year-old male. The patient had a sudden decrease in visual acuity on the 4th day after cataract surgery of the left eye performed at another hospital and visited his previous doctor on the following day. Postoperative endophthalmitis was suspected, so he was referred to our department on the same day. The inflammation was observed in the anterior segment of the left eye. The gram staining results for collected anterior aqueous humor were negative. The patient was followed up with continued medication and careful observation without undergoing emergency surgery. The inflammation of the anterior segment subsequently improved. The patient underwent a left vitrectomy three months later to remove residual vitreous opacity.

Conclusion: Postoperative endophthalmitis after cataract surgery is often indicated for emergency surgery, but there can be cases in which conservative therapy with thorough observation succeeds in retaining visual function.

Key words: Post-cataract surgery endophthalmitis, conservative therapy, aseptic endophthalmitis, bacterial endophthalmitis

INTRODUCTION

The incidence rate of acute postoperative endophthalmitis after cataract surgery is as rare as 0.02% in Japan [1]. However, once endophthalmitis develops, it may progress in a short period and leave severe visual impairment. Postoperative endophthalmitis is classified into infectious and non-infectious types [2]. While non-infectious cases are mainly treated with anti-inflammatory medication, infectious ones often require emergency surgery to dissect the infection focus. On the other hand, consent for reoperation cannot be always obtained due to its heavy mental burden on the patient.

Here we report a case of early post-cataract surgery endophthalmitis with relatively mild symptoms and ocular findings. In this case, emergency surgery was avoided through careful observation considering the possibility of aseptic endophthalmitis.

PATIENT

87 years old, male

Current medical history

A patient underwent phacoemulsification and aspiration (PEA) + intraocular lens (IOL) of the left eye at another hospital in late May, X. Due to a sudden decrease in the left visual acuity on the 4th day after

surgery, he visited his previous doctor on the following day. The corrected visual acuity was 40 cm counting fingers. Eye pain was not present, but postoperative endophthalmitis was suspected based on the severe inflammation of the anterior segment of the eye. The patient was referred to our hospital and visited our department on the same day.

Past medical history

Hypertension, benign prostatic hyperplasia, right cataract surgery (mid-May X)

Ocular findings at the first visit

The visual acuity was ($1.2 \times \text{IOL} \ominus \text{cyl}-0.50\text{D Ax}175^\circ$) for the right eye and 40 cm counting fingers (n.c.) for the left eye, and the intraocular pressure was 10 mmHg and 12 mmHg, respectively. The right eye, which was on the 12th day after cataract surgery, had no notable abnormal findings from the anterior segment to the fundus. The left eye had conjunctival hyperemia, Descemet's fold, inflammatory cells in the anterior chamber, and radially expanding fibrin and hypopyon in the pupillary region and incision wound (Fig. 1a, b). Although the fundus was not visible, B-mode ultrasonography detected no vitreous opacity (Fig. 2). In addition, the result of gram stain and culture of anterior aqueous humor collected using a 27 G needle was negative (Fig. 3).

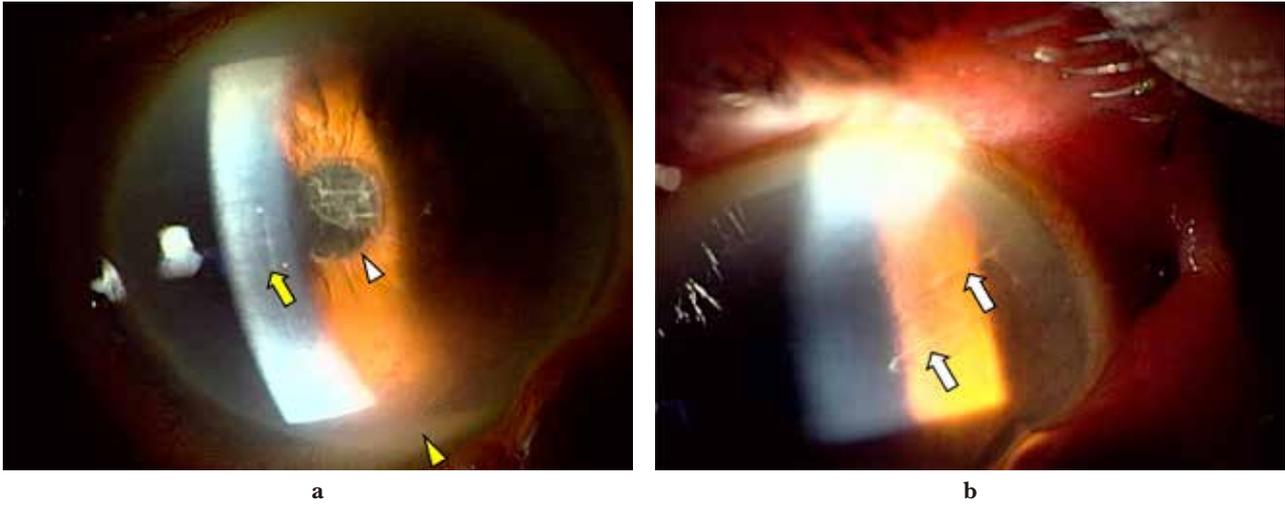


Fig. 1 Photographs of the anterior segment of the left eye at the first visit
 a : Descemet's fold in the anterior eye section (⇒), hypopyon (△), and fibrin in the pupillary region of the anterior chamber (△).
 b : Radially expanding fibrin on the incision wound in the anterior chamber (⇔).



Fig. 2 B-mode ultrasonography of the left eye at the first visit
 No obvious vitreous opacity is observed.

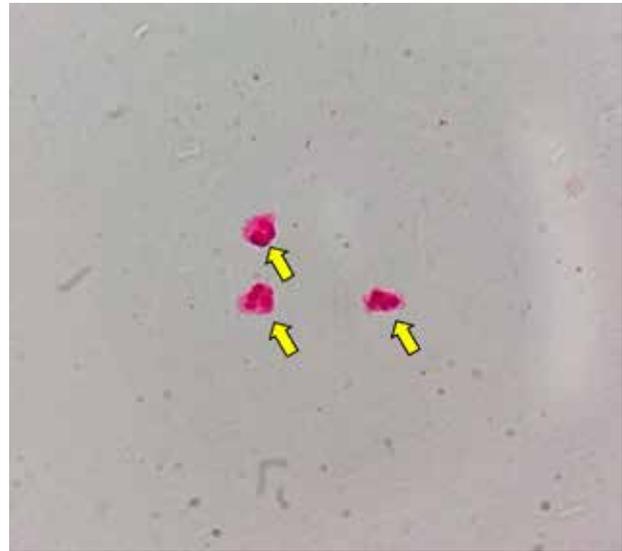


Fig. 3 Gram stain of anterior aqueous humor of the left eye (X100)
 No obvious bacterial cells but only leukocytes (⇒) were detected.

Clinical course

The patient received triamcinolone acetonide sub-Tenon injection for anti-inflammatory purposes without emergency surgery. For ophthalmic drops, he continued gatifloxacin hydrate solution, betamethasone sodium phosphate solution, and diclofenac sodium solution, which had been prescribed by his previous doctor. Two days after injection, inflammation of the anterior segment such as fibrin and hypopyon improved, but vitreous opacity, which was not present at the first visit, appeared (Fig. 4). Since the subjective symptoms tended to improve, we monitored the progress without performing a vitrectomy. The bacterial culture of anterior aqueous humor was proved to be negative. Inflammation of the anterior segment of the left eye and vitreous opacity improved over time, but the left visual acuity remained $0.2 \times \text{IOL}$ ($0.3 \times +3.50\text{D}$) because of residual vitreous opacity (Fig. 5). Therefore, vitrectomy of the left eye was planned approximately three months after the first visit.

The vitreous body was collected during the vitrectomy and submitted for a bacterial culture test and cytopathology. Intraoperatively, we performed retinal photocoagulation and gas tamponade to seal the tear caused by detaching the strongly attached vitreous body. The gram staining and culture of the vitreous body were negative. Cytopathology detected only a small number of neutrophils, lymphocytes, and histiocytes. After the vitrectomy, the left visual acuity improved to 0.8 ($1.2 \times \text{sph} + 0.25\text{D} \ominus \text{cyl} - 0.50\text{D} \text{ Ax}105^\circ$). Optical Coherence Tomography (OCT) showed slight macular edema, but no recurrence of inflammation was observed subsequently (Fig. 6).

DISCUSSION

The causes of acute postoperative endophthalmitis are divided into infectious and non-infectious types. Endophthalmitis due to infection is typically caused by bacteria and often requires emergency surgery. Therefore, determining whether the cause of endoph-



Fig. 4 B-mode ultrasonography of the left eye 2 days after sub-Tenon injection of triamcinolone acetonide. Vitreous opacity that was not present at the first visit is observed.

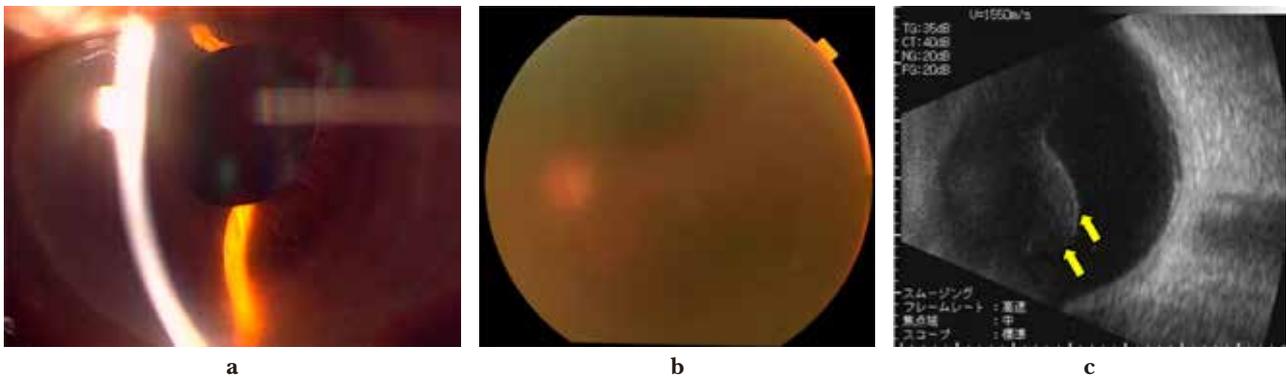


Fig. 5 Findings of the left eye 3 months after the first visit
 a : Hypopyon and fibrin observed at the first visit disappeared.
 b : Vitreous opacity is observed.
 c : Vitreous opacity has improved from the 2nd day after injection but remains on B-mode ultrasonography (⇒).

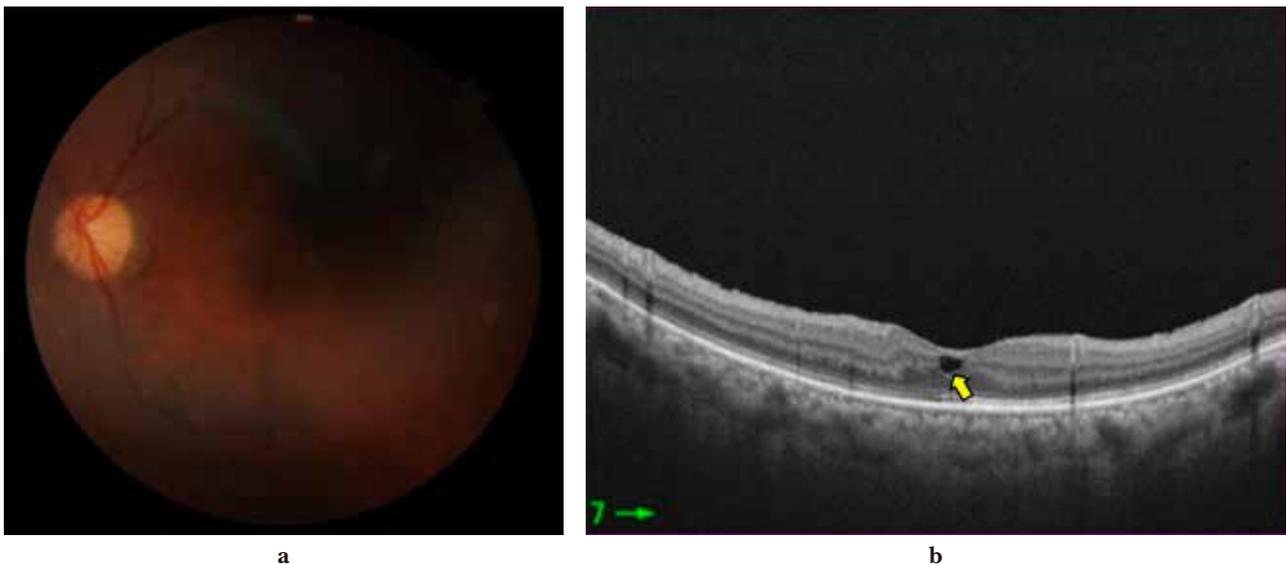


Fig. 6 Fundus photograph and OCT finding of the left eye 1 month after vitrectomy
 a : Vitreous opacity has improved.
 b : Macular edema is observed (⇒).

thalmitis is infection is critical. While the symptoms of bacterial infection are prominent and progressive, our case was relatively mild at the first visit. A previous study reported that about 3/4 of postoperative endoph-

thalmitis after cataract surgery develops with eye pain [3], but our case presented no eye pain. Although more than one day had passed from the onset to the first visit, the visual acuity did not further decrease, and

the inflammation remained localized in the anterior chamber. In addition, gram staining of collected anterior aqueous humor was negative, and few findings suggested infection. Based on those findings, we selected conservative treatment.

The causative bacteria of acute postoperative endophthalmitis are mostly gram-positive bacteria such as coagulase-negative Staphylococcus (CNS), Staphylococcus aureus, β -hemolytic Streptococcus, and Streptococcus pneumoniae. Among them, CNS is the most frequent cause of postoperative endophthalmitis with the frequency of 39.4% [4] and typically follows a less severe course [5]. In previous studies, the positivity rates in gram staining and cultures of anterior aqueous humor or the vitreous samples were 10%–56% in cases clinically diagnosed with acute endophthalmitis, showing a significant difference among the reports [6–9]. Therefore, the possibility of CNS infection cannot be ruled out in our case regardless of the negative culture results of anterior aqueous humor and the vitreous body. Because the PCR test has a higher positive rate than the gram staining and culture tests [10], the causative organism could have been identified by performing the PCR test combined with the culture test.

Non-infectious causes of postoperative endophthalmitis include inflammation due to residual lens nucleus/cortex, relapse of uveitis, and TASS (toxic anterior segment syndrome). Our case had no residual lens nucleus or cortex and no history of uveitis, so endophthalmitis was less likely to be related to these causes. TASS is acute aseptic endophthalmitis that develops within 12–24 hours after surgery and is not progressive without pain. Also, TASS is often associated with severe localized inflammation of the anterior segment but is not accompanied by vitreous opacity. We initially suspected this case as TASS. However, the course was different from TASS since the onset was slightly later than that of general TASS and the vitreous opacity subsequently appeared.

In this case, we could not conclusively determine whether the cause of post-cataract surgery endophthalmitis was an infection or not. According to the EVS study, vitrectomy is recommended for postoperative endophthalmitis with less than light perception in visual acuity, while medication treatment is first recommended for milder cases [3]. However, with the recent improvement in technology and safety, vitrectomy has been more frequently selected for patients with better than light perception in visual acuity [11]. Therefore, we considered surgery at the first visit for this case but carefully observed the progress with conservative therapy based on somewhat mild symptoms and findings

and the negative results of gram staining and culture of anterior aqueous humor. With the medication treatment, inflammation was relieved, good visual acuity was achieved, and emergency surgery was avoided, although the patient eventually needed a vitrectomy. As in this case, postoperative endophthalmitis after cataract surgery can be cases in which conservative therapy with thorough observation succeeds in retaining visual acuity.

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