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Recurrent Endophthalmitis Caused by *Achromobacter xylosoxidans*: Importance of Aggressive Surgical Removal of Capsular Bag

Dear Editor,

Although postcataract endophthalmitis is a rare complication associated with cataract surgery, it is one of the most devastating ocular diseases, and can severely impact the patient's quality of life. *Achromobacter xylosoxidans*, a rare cause of postcataract endophthalmitis, flourishes in humid environments, and is often resistant to conventional antibiotics and surgical treatment [1-4]. We report five recalcitrant, chronic, and recurrent cases of endophthalmitis caused by *A. xylosoxidans*. This is the first report of endophthalmitis caused by *A. xylosoxidans* that provides a case series on clinical features, antibiotic sensitivity, and surgical outcomes in Korea. We present two notable cases from five patients, and recommend extensive surgical management.

Case 1. A 71-year-old man presented with pain, redness, and significant loss of vision in his right eye five days after cataract surgery. Slit-lamp examination showed an edematous cornea, an anterior chamber reaction with a hypopyon, fibrous membrane, and vitreous haziness (Fig. 1A). Postcataract endophthalmitis was suspected, therefore pars plana vitrectomy, empirical intravitreous injections were performed. *A. xylosoxidans* was isolated from the anterior chamber and vitreous culture (Fig. 1B, 1C). An antibiotic sensitivity test was performed, and in the cases in this study, *A. xylosoxidans* was sensitive to imipenem, piperacillin, and ceftazidime. Additional intravitreal injections were administered based on the results; however, the endophthalmitis did not improve (Fig. 1D). We removed the intraocular lens and partial lens capsule by ocutome, and an aphakic state persisted for 8 months (Fig. 1E). A ciliary sulcus fixation of the intraocular lens was performed, but after 1 month, endophthalmitis had recurred with corneal edema, and cellular reactions (Fig. 1F). Additional vitrectomy, repeated intraocular lens removal and en bloc delivery of lens capsule were performed (Fig. 1G, 1H). After surgery, the inflammation diminished without further recurrence (Fig. 1I), and scleral fixation was performed (Fig. 1J). The patient's final vision was 20 / 30 after six vitrectomies and 23 intravitreal injections.

Case 2. A 61-year-old man was transferred with right eye pain after cataract surgery five days prior. His vision was hand motion, and ciliary hyperemia, a severe anterior chamber reaction with fibrous membrane near the pupil margin, were observed (Fig. 1K). Intravitreal injections and pars plana vitrectomy were performed, and the lesion improved but deteriorated 20 days after vitrectomy. Similarly to case 1, repeated vitrectomy and intraocular lens removal, along with en bloc delivery of the lens capsule were performed. Interestingly, *A. xylosoxidans* was isolated from an intraocular lens sample culture. Final vision was 20 / 40 after four vitrectomies and 18 intravitreal injections (Fig. 1L). For all cases, the mean number of vitrectomies was 3.00 ± 2.12, and the mean number of intravitreous injections was 10.80 ± 9.15.

Endophthalmitis caused by *A. xylosoxidans* is recurrent and intractable, and treatment can require surgery, including pars plana vitrectomy with intraocular lens explantation and capsulectomy. Villegas et al. [3] presented histological evidence of *A. xylosoxidans* on the lens capsule; which can remain in the capsular bag and on the intraocular lens. Donlan and Costerton [5] reported that *A. xylosoxidans* creates a biofilm to survive in a toxic environment, suggesting that complete intraocular lens and lens capsule removal are essential for preventing recurrence of *A. xylosoxidans* infections [1-4]. In case 1, endophthalmitis recurred in the presence of the remnant lens capsule after intraocular lens removal and capsular cut by ocutome, using a scleral depressor (Fig. 1M). Finally, en bloc was performed to remove the remnant lens capsule (Fig. 1N). To perform en bloc delivery, in case 1, we selected the end side of the superior remnant capsule with a microforcep and pulled it toward the opposite side (Fig. 1O, 1P). Next, the inferior capsule was held and drawn superiorly (Fig. 1Q, 1R). The procedures were performed gently, which enabled the entire remnant lens capsule to be completely detached from the base. After en bloc delivery was performed in cases 1 and 2, the capsule was completely removed, and recurrence ceased. This suggests that the en bloc delivery of the lens capsule with microforceps is crucial in eliminating the source of the recurrent infection.

In conclusion, endophthalmitis caused by *A. xylosoxidans* shows a high incidence of recurrence, and pars plana

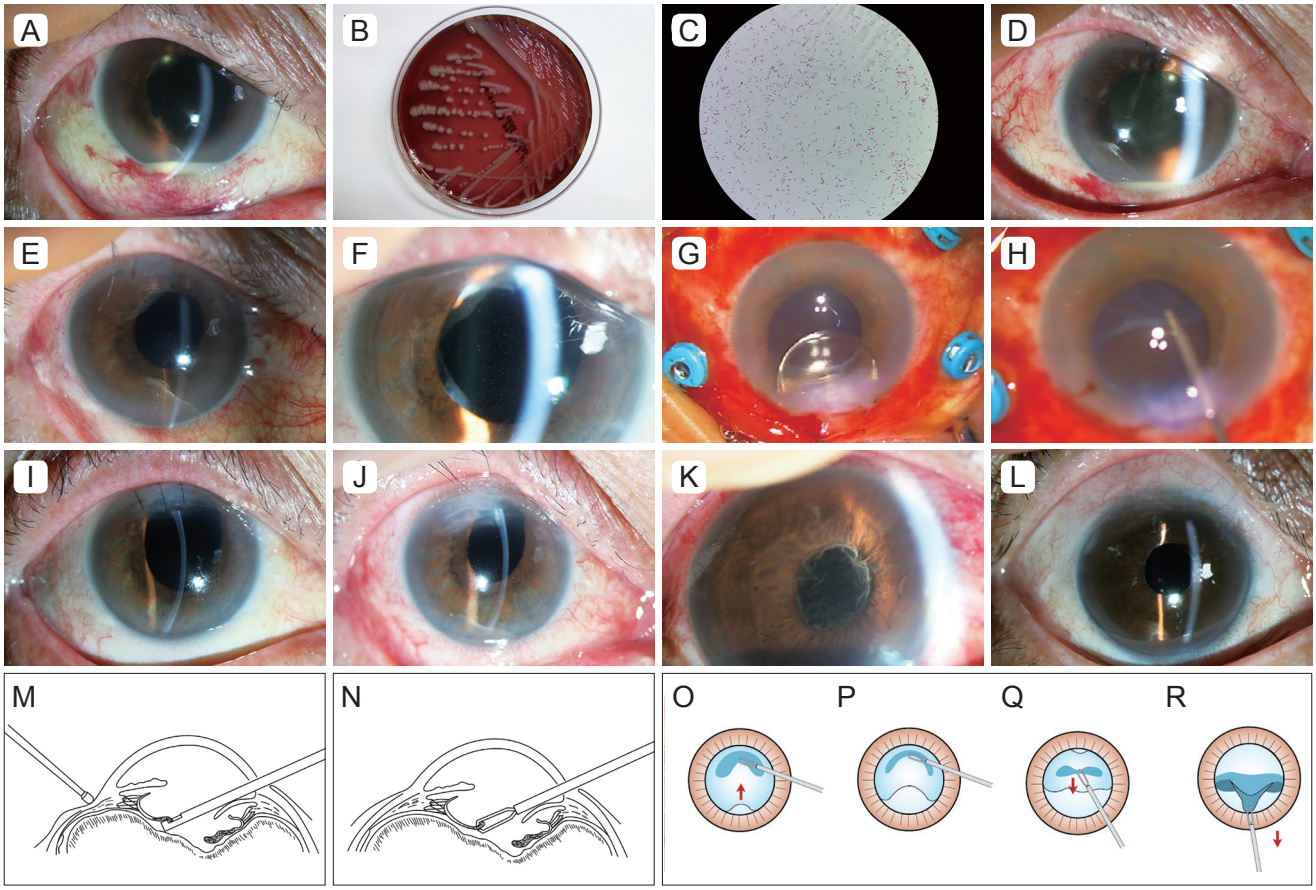

Fig. 1. (A-J) Photographs of case 1. (A) Edematous cornea and an anterior chamber reaction with hypopyon and a fibrous membrane. (B) Blood agar plate culture showing the gram-negative rod *Achromobacter xylosoxidans*. (C) Microphotograph of *A. xylosoxidans* with gram staining (×1,000). (D) Aggravated endophthalmitis, despite pars plana vitrectomy and intravitreal injection. (E) Aphakic and quiet state after intraocular lens explantation and partial lens capsule removal by ocutome. (F) Corneal edema and cellular reactions shown after ciliary sulcus fixation of the intraocular lens. (G) Intraoperative photograph, showing removal of the intraocular lens. (H) Intraoperative photograph showing the remnant lens capsule being removed completely using microforceps. (I) Regressed endophthalmitis after additional vitrectomy, repeated intraocular lens removal and en bloc delivery of the lens capsule. (J) Recovered state after en bloc delivery of the lens capsule and scleral intraocular lens fixation. (K-L) Photographs of case 2. (K) Initial presentation with ciliary hyperemia, anterior chamber reaction, and pupillary fibrotic membrane. (L) Cleared state after repeated intravitreal injections and vitrectomies, including en bloc delivery of the lens capsule. (M) Partial lens capsule removal by ocutome, using a scleral depressor. (N) En bloc delivery of the lens capsule by microforceps. (O,P) Intraoperative en bloc delivery, drawing the lens capsule toward the opposite side. (Q,R) Intraoperative en bloc delivery, holding the other end of the lens capsule, and pulling it toward the opposite side.

vitrectomy, including intraocular lens removal and en bloc delivery of the lens capsule using microforceps, are highly recommended treatment approaches.

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Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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References

1. de-la-Torre A, Lopez-Castillo CA, Bernal-Urrego JA, et al. Postoperative Alcaligenes xylosoxidans endophthalmitis: report of two cases. *Arq Bras Oftalmol* 2008;71:115-7.
2. Han YS, Chung IY, Park JM. A case of Alcaligenes xylosoxidans endophthalmitis after cataract extraction. *J Korean Ophthalmol Soc* 2005;46:186-9.
3. Villegas VM, Emanuelli A, Flynn HW Jr, et al. Endophthalmitis caused by Achromobacter xylosoxidans after cataract surgery. *Retina* 2014;34:583-6.
4. Weissgold DJ, Kirkpatrick B, Iverson M. Acute postoperative Alcaligenes xylosoxidans endophthalmitis. *Retina* 2003;23:578-80.
5. Donlan RM, Costerton JW. Biofilms: survival mechanisms of clinically relevant microorganisms. *Clin Microbiol Rev* 2002;15:167-93.