



## Delayed-onset *micrococcus luteus*-induced postoperative endophthalmitis several months after cataract surgery: A case report

Ki-Yup Nam, Hong-Won Lee

**Specialty type:** Ophthalmology

**Provenance and peer review:**

Unsolicited article; Externally peer reviewed.

**Peer-review model:** Single blind

**Peer-review report's scientific quality classification**

Grade A (Excellent): 0

Grade B (Very good): B

Grade C (Good): 0

Grade D (Fair): 0

Grade E (Poor): 0

**P-Reviewer:** Morya AK, India

**Received:** June 26, 2023

**Peer-review started:** June 26, 2023

**First decision:** August 10, 2023

**Revised:** August 22, 2023

**Accepted:** August 29, 2023

**Article in press:** August 29, 2023

**Published online:** September 26, 2023



**Ki-Yup Nam, Hong-Won Lee**, Department of Ophthalmology, Chungnam National University, College of Medicine, Daejeon 35015, South Korea

**Ki-Yup Nam, Hong-Won Lee**, Department of Ophthalmology, Chungnam National University Hospital, Daejeon 35015, South Korea

**Corresponding author:** Ki-Yup Nam, MD, PhD, Associate Professor, Department of Ophthalmology, Chungnam National University, College of Medicine, 266 Munhwa-ro, Jung-gu, Daejeon 35015, South Korea. [oksnam1231@daum.net](mailto:oksnam1231@daum.net)

### Abstract

#### BACKGROUND

*Micrococcus luteus* (*M. luteus*)-induced endophthalmitis is very rare and may present as either acute or chronic postoperative endophthalmitis. The aim of this study was to report a case of delayed-onset *M. luteus*-induced endophthalmitis that occurred several months after cataract surgery.

#### CASE SUMMARY

A 78-year-old man presented with decreased vision, pain and redness in the right eye that had begun 3 days prior. He had undergone cataract surgery 4 mo prior. Visual acuity was counting fingers; slit-lamp examination revealed conjunctival injection, posterior corneal precipitates, anterior chamber inflammation (cell 4+), and hypopyon. Fundus examination revealed moderate vitreous haze. Urgent vitrectomy was performed for suspected infectious endophthalmitis, followed by vitreous irrigation with injections of antibiotics. On the postoperative day 1, anterior chamber cell decreased to 2+ and hypopyon was not observed on slit lamp examination. Six days postoperatively, the patient had recurrent eye pain, and the anterior chamber cell grade increased to 4+; hypopyon recurred in the anterior chamber, and whitish plaque was observed in the lens capsule. Therefore, the patient underwent intraocular lens (IOL) and lens capsule removal, followed by vitreous irrigation, antibiotics injection, and vitrectomy. *M. luteus* was identified from a lens capsule culture.

#### CONCLUSION

In cases of delayed-onset *M. luteus*-induced endophthalmitis, early vitrectomy and removal of the IOL and lens capsule may be necessary.

**Key Words:** *Micrococcus luteus*; Chronic endophthalmitis; Postoperative endophthalmitis;

## Case report

©The Author(s) 2023. Published by Baishideng Publishing Group Inc. All rights reserved.

**Core Tip:** *Micrococcus luteus* (*M. luteus*)-induced endophthalmitis is very rare, and no case of delayed-onset *M. luteus*-induced endophthalmitis several months after phacoemulsification has been reported. Early vitrectomy, vitreous irrigation, antibiotic injection, and removal of the intraocular lens and lens capsule may be necessary to treat this condition.

**Citation:** Nam KY, Lee HW. Delayed-onset *micrococcus luteus*-induced postoperative endophthalmitis several months after cataract surgery: A case report. *World J Clin Cases* 2023; 11(27): 6592-6596

**URL:** <https://www.wjgnet.com/2307-8960/full/v11/i27/6592.htm>

**DOI:** <https://dx.doi.org/10.12998/wjcc.v11.i27.6592>

## INTRODUCTION

Infectious endophthalmitis, pathogen-induced inflammation of the intraocular cavity, is a very severe eye disease with a poor visual prognosis. The routes of intraocular infection by pathogens in infectious endophthalmitis are broadly divided into exogenous and endogenous. The most common cause of exogenous infectious endophthalmitis is intraocular surgery [1]. Depending on the timing and characteristics of onset, postoperative endophthalmitis can be classified as acute or chronic (or delayed-onset). Acute endophthalmitis generally occurs within 6 wk postoperatively, while chronic endophthalmitis occurs > 6 wk postoperatively [2]. Acute endophthalmitis is 2- to 5-fold more common than chronic endophthalmitis [3]. *Propionibacterium acnes* is the most common causative pathogen in cases of chronic endophthalmitis (41%–63% of cases) [3].

Chronic endophthalmitis generally manifests as mild inflammation that persists and recurs; it begins as anterior chamber inflammation and gradually progresses to the posterior eye. Pain may not be present, but vision is usually impaired. The inflammation responds to steroid therapy, but it tends to recur when steroid treatment is reduced [3,4].

We encountered a case of chronic (or delayed-onset) *micrococcus luteus* (*M. luteus*)-induced endophthalmitis that encountered several months after cataract surgery. This pathogen is a very rare cause, and there have been few relevant reports. Here, we describe this case and review the existing literature.

## CASE PRESENTATION

### Chief complaints

The patient visited our ophthalmology clinic due to a visual impairment, pain, redness and discharge in the right eye.

### History of present illness

The patient is a 78-year-old male and the symptoms had begun 3 d earlier.

### History of past illness

The patient had undergone cataract surgery 4 mo prior.

### Personal and family history

The patient had hypertension, no history of trauma.

### Physical examination

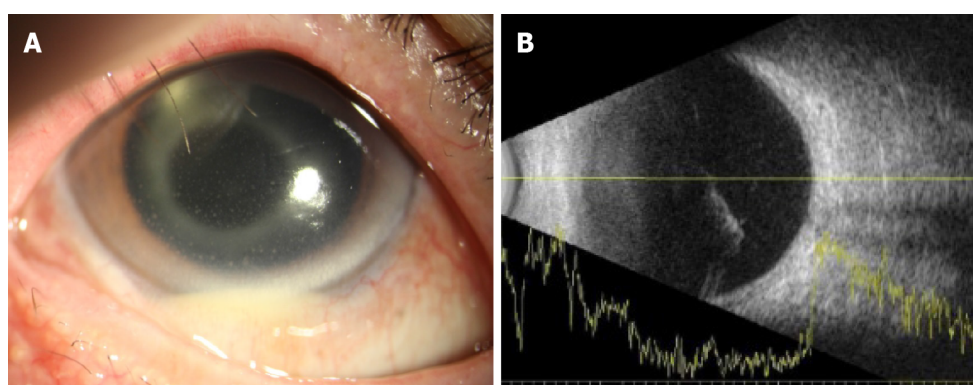
The patient had a visual acuity of counting fingers in the right eye and an intraocular pressure of 11. Slit-lamp examination showed conjunctival injection, corneal endothelial precipitates, anterior chamber cell grade 4+, and hypopyon 1 mm. Fundus examination revealed moderate vitreous opacities (Figure 1). In the left eye, the best-corrected visual acuity (BCVA) was 0.5, and the intraocular pressure was 14. Slit-lamp examination was unremarkable. Fundus examination revealed epiretinal membrane.

### Laboratory examinations

There were no special abnormalities.

### Imaging examinations

B-scan ultrasonography showed vitreous opacity.



DOI: 10.12998/wjcc.v11.i27.6592 Copyright ©The Author(s) 2023.

**Figure 1** Anterior segment photograph and ultrasonogram at initial presentation in a patient with a history of cataract surgery 4 mo prior.

A: Conjunctival injection, keratic precipitates, and hypopyon formation in the anterior chamber; B: Heterogeneous vitreous opacity is evident in the B-scan ultrasonogram.

## FINAL DIAGNOSIS

The patient was suspected of having infectious endophthalmitis.

## TREATMENT

Because of suspected infectious endophthalmitis, emergency vitrectomy and anterior chamber irrigation were performed. Vitreous and anterior chamber aqueous humor samples were obtained for microbial culture test. Intraoperatively, the vitreous cavity was irrigated with 0.2 mg/mL vancomycin (Hanomycin; Samjin Pharm., Seoul, South Korea) and 0.45 mg/mL ceftazidime (Dimcef; Chong Kun Dang Pharm., Seoul, South Korea); vancomycin (1.0 mg/0.1 mL) and ceftazidime (2.25 mg/0.1 mL) were also injected intravitreally. Because there were no specific abnormal findings in the intraocular lens (IOL) and lens capsule, they were not removed.

Postoperatively, 0.5% moxifloxacin (Vigamox®, Novartis) eye drops were applied at 1-h intervals, and 1% cyclopentolate (Cyclogyl®, Alcon, Puurs, Belgium) was applied at 3-h intervals. Antibiotic ointment (3 mg/g Ocuflax Eye Ointment 0.3%, Samil Pharm., Seoul, South Korea) was applied, and moxifloxacin hydrochloride (436.8 mg/250 mL; Avelox, Chong Kun Dang Pharm) was intravenously injected once daily.

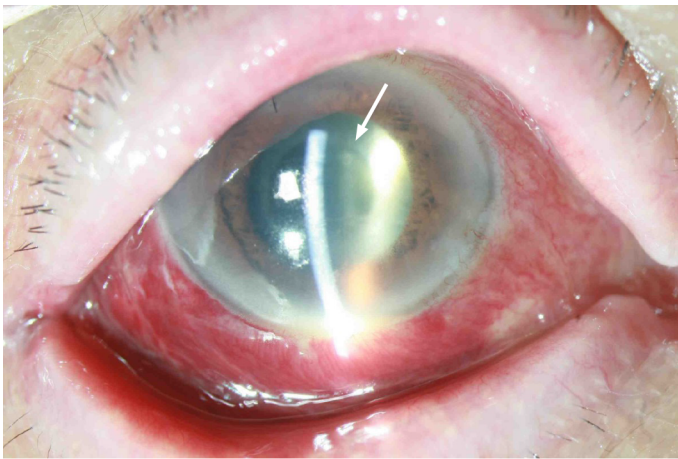
## OUTCOME AND FOLLOW-UP

On the first postoperative day, the visual acuity remained counting fingers; however, the anterior chamber cell grade decreased to 2+, the hypopyon disappeared, and the pain improved. No bacteria were grown in the vitreous culture. On the fifth postoperative day, the BCVA was 0.1, but the anterior chamber cell grade increased again; thus, vancomycin (1.0 mg/0.1 mL) and ceftazidime (2.25 mg/0.1 mL) were intravitreally injected. However, on the next day, pain in the right eye recurred, the anterior chamber cell grade increased to 4+, the hypopyon flare reappeared, and a whitish plaque was observed in the posterior capsule of the lens (Figure 2).

Accordingly, it has been decided to proceed with a reoperation on the sixth postoperative day. The IOL and capsule were removed (Figure 3); intravitreal washout was conducted with vancomycin 0.2 mg/mL and ceftazidime 0.45 mg/mL, as well as intravitreal injection of vancomycin 1.0 mg/0.1 mL and ceftazidime 2.25 mg/0.1 mL. This time, in addition to vitreous and aqueous humor, we also conducted culture tests on the removed IOL and capsular bag. When checking the results of the culture test on the second day after surgery, other samples had negative culture results, but *M. luteus* was identified in a capsular bag culture. The inflammation gradually subsided, the inflammatory cell grade decreased to a trace, and the BCVA improved to 0.15 at 1 wk after reoperation. The inflammation did not recur. At 4 mo postoperatively, the BCVA was 0.8, and the intraocular pressure was 12 mmHg. No signs of inflammation, such as congestion, anterior chamber cells, or vitreous opacity, were observed; transscleral fixation of the IOL is under consideration.

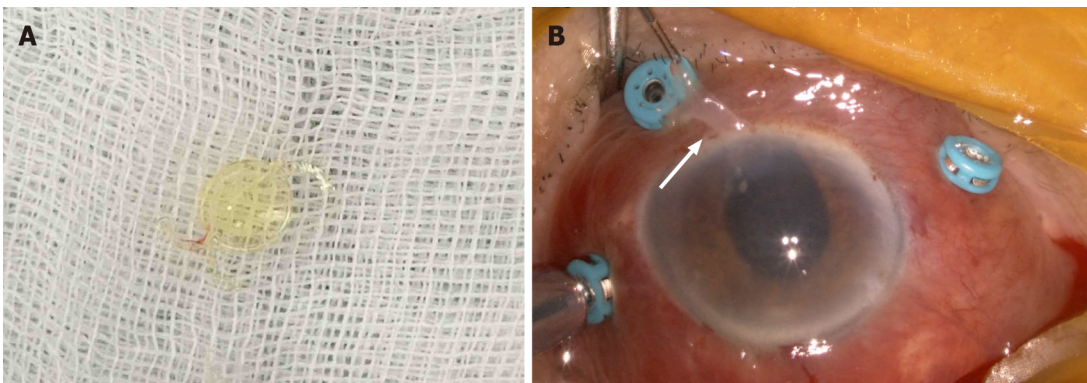
## DISCUSSION

*M. luteus* is a Gram-positive, coagulase-negative member of the normal flora of the eyelid and conjunctiva[5]. In a Korean study of bacterial cultures from the conjunctival sacs of normal patients before cataract surgery or intraocular injection, *M. luteus* represented 2% of all bacterial strains[6]. *M. luteus* is a low-virulence species that rarely causes infections. It can cause opportunistic infections in immunocompromised patients. Thus far, only two cases of *M. luteus*-induced endoph-



DOI: 10.12998/wjcc.v11.i27.6592 Copyright ©The Author(s) 2023.

**Figure 2** Anterior segment photograph on the day of the second operation. Whitish plaque was observed in the lens capsule (white arrow). Anterior chamber cell grade increased to 4+ and hypopyon reappeared.



DOI: 10.12998/wjcc.v11.i27.6592 Copyright ©The Author(s) 2023.

**Figure 3** The intraocular lens and capsule (white arrow) were removed during the second operation. *Micrococcus luteus* was cultured. A: Intraocular lens; B: Capsule.

thlmitis have been reported: One after trauma with an intraocular foreign body and the other after extracapsular cataract extraction[5,7].

The present case was regarded as chronic endophthalmitis because it occurred 4 mo after uneventful cataract surgery. Chronic endophthalmitis typically manifests as mild persistent inflammation; in our patient, it manifested as acute endophthalmitis with sudden vision loss, pain, severe anterior inflammation, and hypopyon. It is unclear whether inflammation was present before symptoms began, but the patient reported no specific symptoms before endophthalmitis onset. Fogla *et al*[5] also described a similar course of *M. luteus*-induced endophthalmitis after extracapsular cataract extraction. Their patient developed persistent anterior inflammation 4 d postoperatively, which improved with steroid treatment but recurred when the medication was tapered. Seven weeks postoperatively, the patient developed acute endophthalmitis with sudden symptom onset.

Surgical removal of the IOL is recommended as treatment for chronic endophthalmitis. In chronic endophthalmitis, bacterial cells penetrate between the IOL and lens capsule, causing persistent inflammation. Moreover, the endophthalmitis does not recur after IOL removal, implying that such removal is necessary to eliminate the source of infection [8]. In the present case, vitrectomy and intravitreal antibiotics were used as primary treatment, but the IOL was not removed. The inflammation improved after the initial vitrectomy, but it recurred as whitish plaques increased on the IOL and lens capsule. During the second surgery, the IOL and lens capsule were removed; the inflammation improved without recurrence. Although vitreous cultures collected during the first and second surgeries were negative, bacteria grew in the lens capsule culture obtained during the second surgery.

Although the recurrence may be associated with antibiotics resistance, Cartwright *et al*[7] reported that initial broad-spectrum coverage with cephazolin sodium and gentamicin is adequate in most cases of *M. luteus*-induced endophthalmitis since *M. luteus* is highly sensitive. In this case, the recurrence is highly likely to be attributed to microorganisms remaining in the residual IOL and lens capsule after the initial surgery, and inflammation was resolved after removal IOL and the lens capsule during second surgery.



## CONCLUSION

We have described a case of delayed-onset *M. luteus*-induced endophthalmitis after cataract surgery. *M. luteus* is a very rare cause of endophthalmitis that can manifest as either persistent and recurrent mild inflammation or acute inflammation with sudden symptom onset even several months after intraocular surgery. Therefore, when endophthalmitis follows such courses, *M. luteus* should be considered as a potential causative agent. Based on previous reports and the treatment course and culture results in the present case, we recommend considering removal of the intraocular lens and capsule to prevent endophthalmitis recurrence.

## FOOTNOTES

**Author contributions:** Nam KY designed the study; Lee HW and Nam KY contributed to the analysis and interpretation of data; Lee HW, and Nam KY contributed to the collection of data; Lee HW and Nam KY drafted the manuscript; Lee HW and Nam KY contributed to the critical review of the article; and all authors issued final approval for the version to be submitted.

**Informed consent statement:** Informed written consent was obtained from the patient for publication of this report and any accompanying images.

**Conflict-of-interest statement:** All the authors declare that they have no conflict of interest.

**CARE Checklist (2016) statement:** The authors have read the CARE Checklist (2016), and the manuscript was prepared and revised according to the CARE Checklist (2016).

**Open-Access:** This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <https://creativecommons.org/licenses/by-nc/4.0/>

**Country/Territory of origin:** South Korea

**ORCID number:** Ki-Yup Nam 0000-0002-3602-8422; Hong-Won Lee 0009-0002-0208-8694.

**S-Editor:** Liu JH

**L-Editor:** A

**P-Editor:** Liu JH

## REFERENCES

- 1 Doft BH. The endophthalmitis vitrectomy study. *Arch Ophthalmol* 1991; **109**: 487-489 [PMID: 2012545 DOI: 10.1001/archophth.1991.01080040055025]
- 2 Johnson MW, Doft BH, Kelsey SF, Barza M, Wilson LA, Barr CC, Wisniewski SR. The Endophthalmitis Vitrectomy Study. Relationship between clinical presentation and microbiologic spectrum. *Ophthalmology* 1997; **104**: 261-272 [PMID: 9052630 DOI: 10.1016/s0161-6420(97)30326-1]
- 3 Maalouf F, Abdulaal M, Hamam RN. Chronic postoperative endophthalmitis: a review of clinical characteristics, microbiology, treatment strategies, and outcomes. *Int J Inflam* 2012; **2012**: 313248 [PMID: 22550607 DOI: 10.1155/2012/313248]
- 4 Zambrano W, Flynn HW Jr, Pflugfelder SC, Roussel TJ, Culbertson WW, Holland S, Miller D. Management options for Propionibacterium acnes endophthalmitis. *Ophthalmology* 1989; **96**: 1100-1105 [PMID: 2788852 DOI: 10.1016/s0161-6420(89)32768-0]
- 5 Fogla R, Biswas J, Parikh S, Madhavan HN. Micrococcal endophthalmitis following extracapsular cataract extraction with foldable silicone intraocular lens implantation. *Indian J Ophthalmol* 2000; **48**: 50-52 [PMID: 11271937]
- 6 Kang JY, Lee W, Noh GM, Jeong BH, Park I, Lee SJ. Fluoroquinolone resistance of Staphylococcus epidermidis isolated from healthy conjunctiva and analysis of their mutations in quinolone-resistance determining region. *Antimicrob Resist Infect Control* 2020; **9**: 177 [PMID: 33148329 DOI: 10.1186/s13756-020-00841-3]
- 7 Cartwright MJ, King MH, Weinberg RS, Guerry RK. Micrococcus endophthalmitis. *Arch Ophthalmol* 1990; **108**: 1523-1524 [PMID: 2244829 DOI: 10.1001/archophth.1990.01070130025012]
- 8 Deramo VA, Ting TD. Treatment of Propionibacterium acnes endophthalmitis. *Curr Opin Ophthalmol* 2001; **12**: 225-229 [PMID: 11389352 DOI: 10.1097/00055735-200106000-00015]



Published by **Baishideng Publishing Group Inc**  
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

**Telephone:** +1-925-3991568

**E-mail:** [bpgoffice@wjgnet.com](mailto:bpgoffice@wjgnet.com)

**Help Desk:** <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

