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

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Abstract

BACKGROUND

Micrococcus luteus (*M. luteus*)-induced ¹endophthalmitis 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

⁵A 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

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.

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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

1

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. 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.

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Imaging examinations

B-scan ultrasonography showed vitreous opacity.

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); ² 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 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 ¹ 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, ³ 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 intraocular lens and capsule were removed (Figs. 3 and 4); intravitreal washout was conducted with vancomycin 0.2 mg/mL and ceftazidime 0.45 mg/mL, as well as intravitreal ² 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 intraocular lens 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 intraocular lens 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 endophthalmitis 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.* also described a similar course of *M. luteus*-induced endophthalmitis after extracapsular cataract extraction.(5) Their patient developed persistent anterior inflammation 4 days 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 intraocular lens is recommended as treatment for chronic endophthalmitis. In chronic endophthalmitis, bacterial cells penetrate between the intraocular lens and lens capsule, causing persistent inflammation. Moreover, the endophthalmitis does not recur after intraocular lens 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 intraocular lens was not removed. The inflammation improved after the initial vitrectomy, but it recurred as whitish plaques increased on the intraocular lens and lens capsule. During the second surgery, the intraocular lens 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 intraocular lens (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.

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