

Case Report

Endogenous Bacterial Endophthalmitis Caused by Iliopsoas Abscess

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A 79-year-old woman presented to our hospital with a 10-day history of gradually worsening binocular vision and severe backache. Further investigations revealed poor bilateral best-corrected visual acuities (BCVA), bilateral vitreous opacities, gray-white lesions scattered throughout the retina, and a left iliopsoas abscess on CT that later grew out methicillin-sensitive *S. aureus*. The abscess was drained and intravenous antibiotics were initiated, but the left eye additionally required intravitreal vancomycin. BCVA for both eyes normalized within 1 year. Intramuscular abscess should be considered as a possible primary lesion in cases of endogenous bacterial endophthalmitis.

Key words: endogenous bacterial endophthalmitis, methicillin-sensitive *Staphylococcus aureus*, iliopsoas abscess, intravitreal injection, vancomycin

Endogenous bacterial endophthalmitis (EBE) is a rare but severe intraocular infection with a poor visual prognosis [1], accounting for 2–10% of all cases of endophthalmitis [1–4]. EBE occurs when an organism reaches the eye via the bloodstream and crosses the blood—ocular barrier. A previous study detected an extraocular focus of infection was detected in 64% patients, with the most common sites being the liver, lungs, and endocardium [2]. EBE secondary to an abscess in the skeletal muscle is less common—and to our knowledge, EBE secondary to an iliopsoas abscess (IPA) has only been reported twice [5,6]. Here we present a case involving an elderly woman whose vision significantly improved after drainage of IPA and systemic and local antibacterial treatment.

Case Presentation

A 79-year old woman presented to our hospital with a 10-day history of gradual reduction in her binocular vision and severe backache but without eye pain. She had been diagnosed with uveitis at a local clinic and treated with steroid and antibiotic eye drops for 3 days. However, her best-corrected visual acuity (BCVA) fell to 20/500 and 20/33 in the right and left eyes, respectively, and she was referred to our hospital the following day.

The patient's medical history included hypertension well-controlled by oral medication (amlodipine 10 mg/day) with no other history of systemic or infectious diseases. She had undergone right total hip arthroplasty for a traumatic fracture 2 years prior; moreover, she had a history of penicillin allergy that caused a systemic cutaneous drug eruption. Her ophthalmological history

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included the following: photocoagulation therapy for central serous chorioretinopathy in the left eye 15 years prior, vitrectomy combined with cataract surgery for epiretinal membrane in the right eye 3 years prior, and cataract surgery in the left eye 2 years prior. After receiving these treatments, she visited the local clinic regularly and exhibited a BCVA of 20/20 in both eyes.

At the first visit to our hospital, her BCVA of counting fingers (30 cm) in the right eye and hand motion in the left eye, with intraocular pressures of 9 and 6 mmHg, respectively. Slit-lamp examination of both eyes revealed scattered white blood cells in the anterior chamber and slight pigmentation on the surface of the intraocular lens. The fundus of both eyes was obscured by vitreous opacities, and gray-white retinal exudates (Fig. 1A and B, arrowheads) were scattered across the retina. In addition, white retinal vessels were seen in the temporal retina of the left eye (Fig. 1B, arrows). Optical coherence tomography (OCT) revealed retinal thickening due to the previously diagnosed epiretinal membrane in the right eye (Fig. 1C). Details of the retinal structure in the left eye were unclear because of the vitreous opacity (Fig. 1D).

Moreover, the patient's vital signs were unstable.

Her blood pressure was 84/56 mmHg, pulse was 112/min, and body temperature was 35.6°C. She complained of mild drowsiness (Japan Coma Scale, I-1), and there was remarkable swelling in bilateral forearms and lower legs. Blood examination revealed severe systemic inflammation with a white blood cell count of 18,870/ μ l and a C-reactive protein (CRP) level of 20.34 mg/dl. Computed tomography (CT) with contrast revealed enlargement of the left iliopsoas muscle (Fig. 2A, arrowheads) with low-density areas (Fig. 2A, asterisks) in a ring-enhancing lesion (Fig. 2A, arrows) within the muscle. Accordingly, iliopsoas abscesses were suspected.

The patient was diagnosed with septic shock, binocular EBE and left iliopsoas abscess. She was immediately moved to the Emergency Intensive Care Unit, where intravenous meropenem 1 g b.i.d, clindamycin 0.6 g q.i.d, and vancomycin 1 g q.i.d. were initiated. The same day, percutaneous CT-guided pus drainage from the left IPA was performed. Gram stain of the pus showed gram-positive-cocci in clusters (Fig. 2B, arrows). Three days after hospitalization, the condition of the right eye remained unchanged, whereas the view of the left fundus was significantly obscured by worsen-

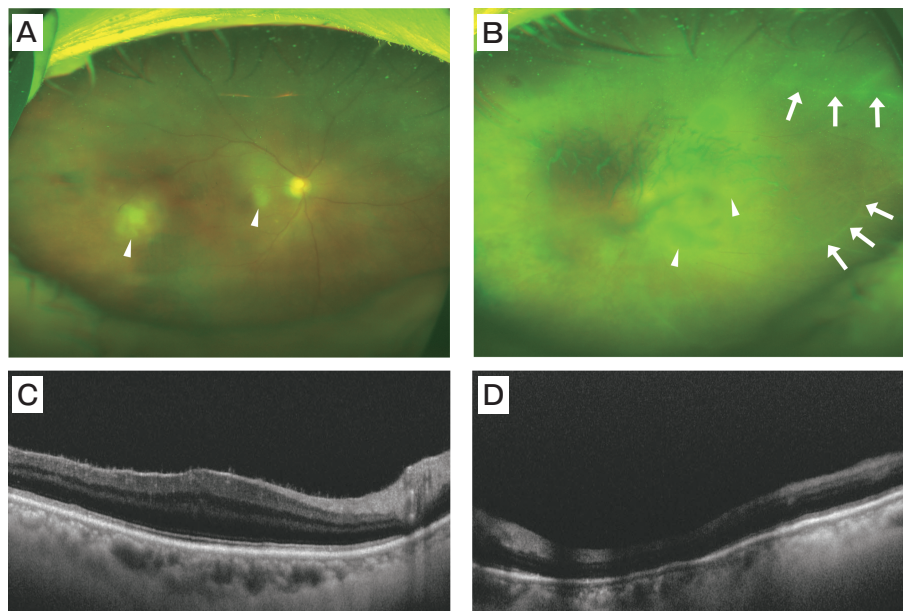


Fig. 1 Fundus photography and optical coherence tomography images at the first visit of a 79-year-old woman with endogenous bacterial endophthalmitis secondary to iliopsoas abscess. At the first visit, the fundus in both eyes appears obscured by vitreous opacities, and gray-white retinal exudates are scattered around the retina (arrowheads, **A** and **B**). White retinal vessels are also seen in the temporal retina of the left eye (arrows, **B**). Optical coherence tomography reveals retinal thickening associated with a previous epiretinal membrane in the right eye (**C**), and the retinal structure in the left eye is unclear because of the vitreous opacity (**D**).

ing of the vitreous opacity. Thus, intravitreal vancomycin 1 mg was administered in the left eye; the usual treatment of ceftazidime could not be used because she had a history of penicillin allergy and we were concerned that administration of the β -lactam antibiotics could cause similar systemic side effects. Four days after

hospitalization, culture of pus from the IPA revealed methicillin-sensitive *S. aureus* (MSSA). MSSA was also detected in the blood culture. One week after hospitalization, her general condition had improved and EBE in both eyes had improved. Although bedside visual acuity measurements were not performed, fundus exam-

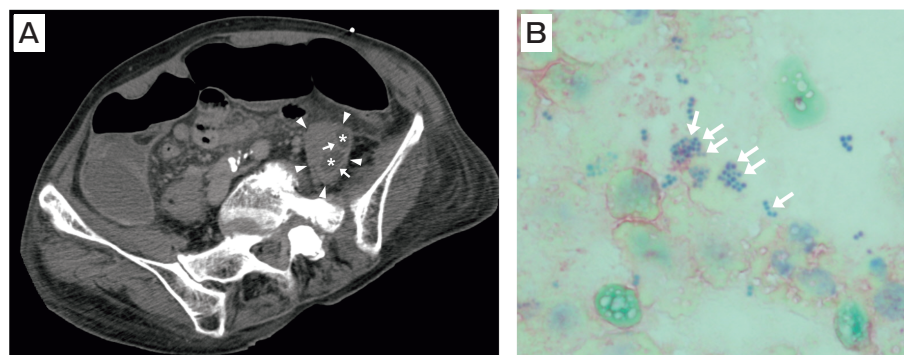


Fig. 2 Initial abdominal computed tomography (CT) image and results of Gram staining for a 79-year-old woman with endogenous bacterial endophthalmitis secondary to iliopsoas abscess. Initial abdominal CT with contrast reveals enlargement of the left iliopsoas muscle (arrowheads, **A**) with low-density areas (asterisks, **A**) in a ring-enhancing lesion (arrows, **A**); iliopsoas abscesses were suspected. Puncture of the abscess and examination of the specimen revealed gram-positive-cocci in clusters (arrows, **B**), and culture confirmed methicillin-sensitive *Staphylococcus aureus*.

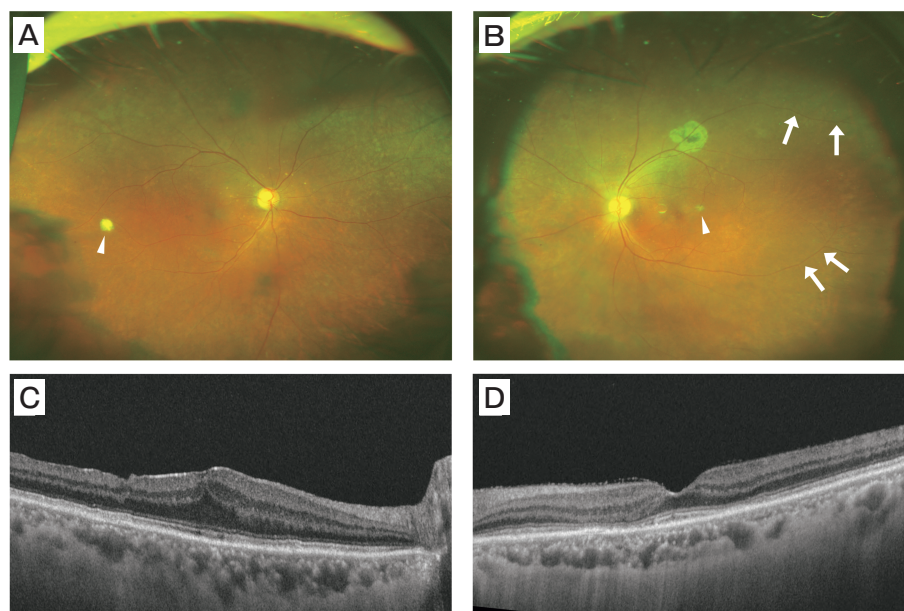


Fig. 3 Fundus photography and optical coherence tomography images obtained at the final visit of a 79-year-old woman with endogenous bacterial endophthalmitis secondary to iliopsoas abscess. A fundus photograph obtained 1 year after the first visit shows that the vitreous opacity has disappeared in both eyes. The retinal exudate has resulted in scarring (arrowheads, **A** and **B**). The white retinal blood vessels in the left eye show reperfusion (arrows, **B**). Optical coherence tomography shows no retinal detachment or retinal edema associated with inflammation, although retinal thickening associated with a previous epiretinal membrane can be observed in the right eye (**C**), while retinal thinning associated with previous central serous chorioretinopathy can be observed in the left eye (**D**).

ination showed clearing in both eyes with a reduction in the vitreous opacities. One month after hospitalization, her general condition improved and her BCVA had improved to 20/29 and 20/40 in the right and left eyes, respectively. Therefore, she was discharged from our hospital after discontinuing administration of antibiotics. One year later, the vitreous opacities in both eyes had almost disappeared, with BCVAs of 20/20 and 20/25 in the right and left eyes, respectively (Fig. 3).

Discussion

We report a case of bilateral EBE secondary to IPA, with successful visual outcomes after abscess drainage and intensive antibiotic treatment. Although intraocular fluid culture was not performed in this case, the presumptive diagnosis of bilateral EBE due to IPA was confirmed by the clinical course. EBE due to skeletal muscle abscess is uncommon, and to the best of our knowledge, there are only 2 cases of EBE due to psoas/iliopsoas abscess whose clinical course were known in the NCBI database, one by Nishida *et al.* [5] and another by Voros *et al.* [6] (Table 1). In both cases,

there was severe systemic inflammation with high-sensitivity CRP in the peripheral venous blood, and *S. aureus* was detected in the fluid from the abscess. Systemic administration of antibiotics and vitreous injection were effective, and the visual outcome was relatively good without the need for vitrectomy. These features were consistent with those of the present case.

In the present case, there were no apparent foci of infection or any systemic disease history suggesting a clear source for the IPA. IPA is characterized by pus accumulation within the iliopsoas muscle, and its incidence is approximately 0.4 cases for 100,000 population per year [8]. It can occur in patients with diabetes mellitus, intravenous drug abuse, AIDS, renal failure, and immunosuppression [9]. Therefore, the etiology of the abscess in the present case remains unclear.

The most common agent of IPA is *S. aureus* [10-12], reported by one study as the causative organism in over 88% of patients with primary IPA [10]. The prognosis of IPA is generally good; however, delayed or inadequate treatment usually results in death. Therefore, early diagnosis is crucial. The rate of mortality from an undrained abscess is close to 100%, with septicemia

Table 1 Previously reported cases and the present case of endogenous bacterial endophthalmitis secondary to iliopsoas abscess

		Nishida <i>et al.</i> [5]	Voros <i>et al.</i> [6]	Present case	
Eye		OS	OS	OU	
Age (years)		60	45	79	
Sex		F	M	F	
Organism		<i>S. aureus</i>	<i>S. aureus</i>	<i>S. aureus</i>	
CRP (mg/dl)		21.4	14.5	20.3	
Culture	Blood	+	–	+	
	Vitreous	ND	–	ND	
	Iliopsoas abscess	+	+	+	
Antibiotics	Systemic	PAPM/PM, VCM, CLDM, CTRX	RFP, CLDM, MEPM	MEPM, CLDM, VCM	
	Intravitreal	CAZ	VCM, CAZ	VCM	
BCVA	Initial	20/25	20/120	CF (OD)	HM (OS)
	Outcome	20/17	20/80	20/20 (OD)	20/25 (OS)
Backache at the first visit		Unknown	+	+	

OD, right eye; OS, left eye; OU, both eyes; F, female; M, male; CRP, C-reactive protein; ND, not done; PAPM/PM, panipenem; VCM, vancomycin; CLDM, clindamycin; CTRX, ceftriaxone; CAZ, ceftazidime; RFP, rifampicin; BCVA, best-corrected vision acuity; CF, counting fingers; HM, hand motion.

being the most common cause of death [13]. In the present case, MSSA was detected in the blood as well as the IPA, and the initiation of appropriate broad-spectrum antibiotics along with CT-guided drainage of the abscess and intravitreal injection of vancomycin resulted in healing and favorable visual outcomes.

In conclusion, intramuscular abscess should be considered as a possible primary lesion in cases of EBE, complaints of localized pain, together with CT exam, may be useful in identifying the source.

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