

## Endogenous Endophthalmitis after Severe Burn: A Case Report

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### Abstract

**Purpose:** This report describes a rare ocular complication in a burned patient.

**Case Report:** A 12-year-old girl was admitted to our burn center because of full thickness burn of 46% of her total body surface area. On the 23<sup>rd</sup> day of her stay, she complained of pain and decreased visual acuity in the right eye. Examination of this eye revealed panuveitis, dense vitritis, and a large chorioretinal abscess in the macular area; her best corrected visual acuity (BCVA) in this eye was hand motion. The left eye was completely normal. A smear and culture of the vitreous biopsy revealed the presence of *Candida albicans*. With a diagnosis of endogenous endophthalmitis due to fungal infection, the patient was treated with systemic fluconazole, intravitreal injection of Amphotericin B, and pars plana deep vitrectomy. After 6 months, the patient's final ocular examination revealed BCVA of counting fingers at two meters, a large macular scar, and quiescence of the intraocular infection.

**Conclusion:** Burn patients treated with broad-spectrum antibiotics are at risk of candidemia and its complications, including endogenous endophthalmitis. Early diagnosis of endogenous endophthalmitis in high risk patients could prevent visual loss.

**Keywords:** Endogenous Endophthalmitis; Burns; Broad-spectrum Antibiotics; *Candida Albicans*

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### INTRODUCTION

Endophthalmitis is a rare but potentially sight-threatening disease characterized by marked inflammation of intraocular tissues and fluids. This ocular condition can be divided into two broad categories of exogenous

endophthalmitis and endogenous endophthalmitis. Endogenous endophthalmitis is caused by the hematogenous spread of infectious organisms from distant sites of the body.<sup>[1]</sup> This condition is uncommon and generally accounts for 2–16% of all reported endophthalmitis cases,<sup>[2]</sup> but the prevalence has been reported to be as high as 41% in one series.<sup>[3]</sup>

Risk factors include compromised immune system, recent and long duration of hospitalization, diabetes mellitus, malignancies, intravenous drug abuse, organ abscesses, immunosuppressive therapy, indwelling catheter, urinary tract infections, organ transplant, end-stage renal or hepatic diseases,

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endocarditis, bacterial meningitis, pyogenic arthritis, lymphoma/leukemia, human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), skin cellulitis/abscess, and admission to an intensive care unit. Fungal endogenous endophthalmitis is usually associated with immunocompromised states, and the most common causative organisms are *Candida* species.<sup>[4-6]</sup>

Among patients with hematogenous infections, the occurrence rates of endogenous endophthalmitis were higher in children and middle-aged patients.<sup>[5]</sup> Here, we report a rare case of endogenous fungal endophthalmitis in a young girl with severe burns.

## CASE REPORT

A 12-year-old girl was admitted to the burn center because of deep burns in 46% of her total body surface area. She underwent serial excision and grafting [Figure 1]. She was treated with broad-spectrum antibiotics because of severe sepsis that developed during her extended hospitalization. On the 23<sup>rd</sup> day of her stay, she complained of pain and decreased visual acuity in the right eye. In ophthalmologic examination, her best corrected visual acuity (BCVA) was hand motion in the right eye and 20/20 in the left one. Ocular examination of the right eye revealed panuveitis associated with anterior chamber hypopyon, dense vitritis, and a



**Figure 1.** A picture of the patient; some parts of her upper chest and upper extremities had undergone autograft, and other burned areas had been partially prepared for the next surgery.

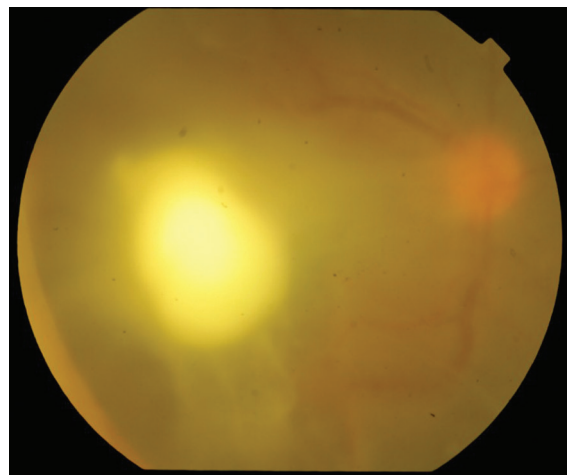
large chorioretinal abscess located in the macular area [Figure 2]. The left eye was completely normal. Smear and culture of the vitreous biopsy revealed *Candida albicans*. The patient was diagnosed with fungal endogenous endophthalmitis and was treated with 300 mg/day of systemic fluconazole, intravitreal injection of Amphotericin B (5 µg/0.1 cc), and pars plana deep vitrectomy. After 2 months, her BCVA was hand motion in the right eye because of a large macular scar, and this eye was free from inflammation. The left eye was normal. At month 3, the right eye developed retinal detachment, and underwent repeat pars plana vitrectomy, membrane peeling, and silicone oil injection. At month 6, the final BCVA improved to counting fingers (CF) at two meters, and the retina was completely attached with a central macular scar [Figure 3].

## DISCUSSION

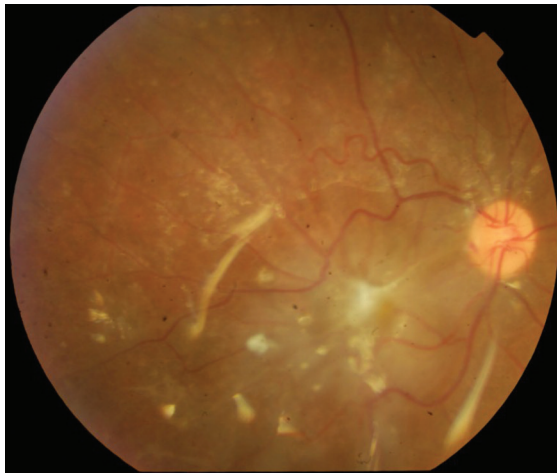
This report describes a case of fungal endogenous endophthalmitis in the context of extensive burning. Risk factors for endogenous endophthalmitis in this case are compromised immune system due to severe burn, prolonged hospitalization, central vein catheter insertion, long-term use of broad-spectrum antibiotics, and young age.

In contrast to other types of endophthalmitis, for which bacteria are the most prevalent pathogens, fungi were the most commonly isolated microorganisms in several case series of endogenous endophthalmitis. The leading cause of fungal endogenous endophthalmitis is *Candida albicans* followed by *Aspergillus* species.<sup>[7-9]</sup>

Bacterial endogenous endophthalmitis is typically due to Gram-positive species in western nations,<sup>[9]</sup> while Gram-negative species (specifically *Klebsiella* species) are the main cause of bacterial endogenous endophthalmitis in East Asian countries.<sup>[4]</sup>



**Figure 2.** A fundus photograph taken at first presentation contain hazy media because of vitritis and a large macular abscess in the right eye.



**Figure 3.** The last fundus photograph at month 6 reveals a macular scar, a completely attached retina, and silicone oil reflex.

Symptoms and signs of endogenous endophthalmitis include decreased vision, eye pain and redness, photophobia, floaters, eyelid swelling, hypopyon, subconjunctival hemorrhage, conjunctival injection, iritis/retinitis, corneal edema, anterior chamber cells, and reduced or absent red reflex.<sup>[10,11]</sup>

Systemic findings and bilateral involvement are common. Systemic findings are the signs and symptoms associated with sepsis or bacteremia, such as fever, chills, nausea, and vomiting. Bilateral involvement has been reported in 19–33% of cases with endogenous endophthalmitis,<sup>[7,10,11]</sup> yet our case had unilateral involvement.

Management of endogenous endophthalmitis includes a variable combination of systemic and intravitreal antibiotics (or antifungals) and pars plana vitrectomy.<sup>[12]</sup>

The full treatments of fungal endogenous endophthalmitis, including intravitreal antifungal injections, systemic antifungals, and ocular surgery were applied in this case. The patient underwent repeat pars plana vitrectomy, membrane peeling, and endotamponade with silicone oil injection for retinal detachment that developed after 3 months. In the last ocular exam at month 6, the patient's BCVA had improved to CF at two meters with complete retinal reattachment and inactive inflammation. The visual outcome was unsatisfactory in our case because of the delayed diagnosis and extensive chorioretinal macular involvement at presentation.

The diagnosis of endogenous endophthalmitis is based on smears and cultures of ocular samples taken from the anterior chamber fluid and vitreous. It can sometimes be aided by the presence of systemic signs and symptoms of infection and also by blood cultures. However, endogenous endophthalmitis may occur in patients with no overt signs of systemic infection.<sup>[13]</sup> In

addition, negative blood cultures do not necessarily rule out the diagnosis.<sup>[9]</sup> Real-time polymerase chain reaction has been used to identify both bacteria<sup>[14]</sup> and fungi.<sup>[15]</sup>

A meta-analysis reported that among endogenous endophthalmitis case series conducted between 2001 and 2012 (a total of 89 eyes), 41% of eyes had a final visual acuity of at least 20/200 and 19% underwent enucleation or evisceration.<sup>[11]</sup> Among the three broad categories of pathogens found in endogenous endophthalmitis, bacteria, yeasts, and molds, cases caused by molds (*Aspergillus* species) are associated with the worst final visual outcomes, and cases caused by yeasts (*Candida* species) are associated with the best.<sup>[12]</sup>

In conclusion, endogenous endophthalmitis should be considered in patients with extensive burns and prolonged hospitalization who have received broad-spectrum antibiotics. Early diagnosis of endogenous endophthalmitis in high risk patients could prevent severe visual loss.

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### Conflicts of Interest

There are no conflicts of interest.

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