

Corneal Perforation with Preseptal Cellulitis in a Patient with Acute Lymphocytic Leukemia

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We report a case of corneal perforation with preseptal cellulitis in a patient with acute lymphocytic leukemia (ALL). A 17-yr-old female patient who was undergoing combination chemotherapy for ALL was referred due to upper lid swelling and pain in the right eye for 2 days. Visual acuity in the right eye was 20/20. Initial examination showed no abnormal findings, other than swelling of the right upper eyelid. Computed tomography showed a finding of preseptal cellulitis. Microbiologic study of bloody and purulent discharge revealed *Serratia marcescens*. Corneal melting and perforation with iris prolapse were detected in the right eye on the 16th day. Emergent tectonic keratoplasty was performed. Seven months after surgery, visual acuity in the right eye was 20/300, and the corneal graft was stable.

Key Words: Precursor Cell Lymphoblastic Leukemia-Lymphoma; Drug Therapy; Corneal Perforation; Preseptal Cellulitis; *Serratia marcescens*

INTRODUCTION

Systemic chemotherapy can lead to a variety of ocular complications, such as cicatricial ectropion, nasolacrimal duct stenosis, conjunctivitis, keratitis, cataract, macular edema, retinopathy, and optic neuropathy (1, 2). Although bulbar perforation with orbital cellulitis has been reported in an immunocompromised patient, corneal perforation has not been documented in patients undergoing systemic chemotherapy (3).

We report a case of corneal perforation with preseptal cellulitis in a patient treated with systemic chemotherapy for acute lymphocytic leukemia (ALL).

CASE REPORT

A 17-yr-old female patient undergoing systemic chemotherapy for ALL was referred to our hospital due to swelling and pain of the right upper lid for two days. Laboratory examination showed leukocytes 40 cells/ μ L, erythrocytes 3.6×10^3 cells/ μ L, hemoglobin 10.8 g/dL, hematocrit 30.6%, and thrombocytes 33×10^3 cells/ μ L. The patient received induction chemotherapy (vincristine, prednisolone, daunorubicin, and L-asparaginase). Visual acuity in the right eye was 20/20. There were no abnormal findings, other than diffuse swelling of the right upper eyelid. Orbital computed tomography showed findings of preseptal cellulitis in the right upper lid. Intravenous empirical antibiotics (teicoplanin, meropenem, and amphotericin B) were administered. *Serratia marcescens* was isolated from blood culture on the following

day. Slit lamp examination on the 7th day revealed superficial punctate erosions in both corneas. Artificial tear eye drops were used for the treatment of superficial punctate erosions. On the 12th day, spontaneous bloody and purulent discharge from the upper palpebral conjunctiva occurred in the right eye. The patient was treated with topical levofloxacin eyedrops. Culture from the discharge was isolated from *S. marcescens*. Systemic antibiotics (meropenem) were maintained per the antibiotic sensitivity test. On the 16th day, periorbital swelling decreased, however, corneal melting and perforation with iris prolapse was noted in the right eye (Fig. 1). Emergent tectonic keratoplasty was performed. Seven months after surgery, visual acuity in the right eye was 20/300, and intraocular pressure was 14 mmHg. The corneal graft was stable, with mild haziness.

DISCUSSION

Ocular complications associated with systemic chemotherapy can be divided into complications in the adnexa, anterior segment, and posterior segment. Previously reported complications in the anterior segment include conjunctival injection, conjunctivitis, corneal edema, keratitis, and corneal opacity (1, 2). Anti-cancer agents such as cytosine arabinoside, 5-fluorouracil, carmustine, deoxycoformycin, and tamoxifen have been known to cause corneal toxicity (1, 2, 4, 5). In our case, vincristine, prednisolone, daunorubicin, and L-asparaginase were used for combination chemotherapy. To the best of our knowledge, corneal toxicity associated with these anticancer agents has not been

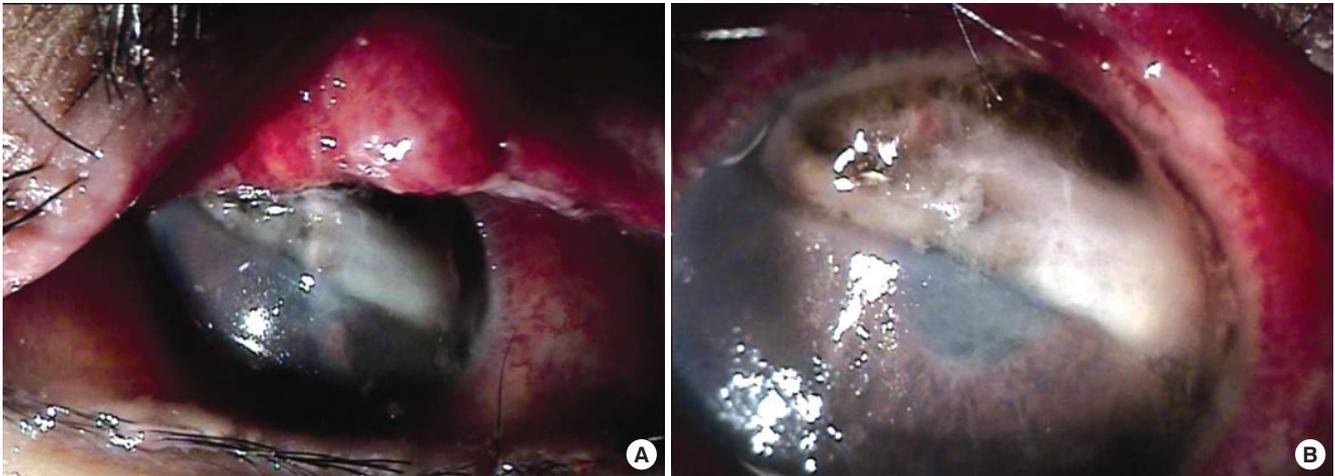


Fig. 1. Slit lamp photographs in a 17-yr-old female patient receiving systemic chemotherapy for acute lymphocytic leukemia. **(A)** Marked congestion and inflammation of the upper tarsal conjunctiva and a melting lesion with sharp demarcation observed in the upper part of the cornea. **(B)** The iris was prolapsed at the perforated site.

reported.

Serratia marcescens, a motile, Gram-negative coccobacillus, is an emerging opportunistic pathogen noted for causing urinary, respiratory, blood stream, and ocular infections (6). Preseptal cellulitis in the present case was caused by *S. marcescens* because the patient was immunocompromised. Rapid progression of stromal infiltration and ulceration is a clinical feature of *Serratia* keratitis. Extracellular protease produced by *S. marcescens* is considered a major corneal destructive factor. In an experimental study of rabbit cornea, *Serratia* protease preparations have caused rapid and extensive liquefactive corneal necrosis, descemetocoele formation, and corneal perforation (7).

The exact mechanism of corneal melting and perforation in this case is unclear. It is possible that *S. marcescens* in the purulent discharge directly invaded the cornea with superficial punctate erosions and caused corneal melting and perforation in the immunocompromised patient. This hypothesis is supported by two facts: First, *S. marcescens* is a virulent organism. Second, corneal melting and perforation occurred in the area in direct contact with the infected upper palpebral conjunctiva.

In conclusion, physicians should consider the possibility of serious ocular complications, such as severe bacterial keratitis or corneal perforation in cases of preseptal cellulitis caused by a virulent organism, particularly in immunocompromised patients.

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