



Case Report

Systemic Lupus Erythematosus Presenting as Corneal Perforation

Hung-Chi Jesse Chen^{1,2*}, Ju-Chuan Cheng³, Ching-Hsi Hsiao¹, David Hui-Kang Ma^{1,4}

¹Department of Ophthalmology, Chang Gung Memorial Hospital, Taoyuan, Taiwan

²Graduate Institute of Clinical Medical Sciences, Chang Gung University, Taoyuan, Taiwan

³Department of Ophthalmology, Cathay General Hospital-Shijhih, Taipei, Taiwan

⁴Department of Chinese Medicine, College of Medicine, Chang Gung University, Taoyuan, Taiwan

Article info

Article history:

Received: July 3, 2008

Revised: July 29, 2008

Accepted: August 25, 2008

Keywords:

Antinuclear antibody

Corneal perforation

Peripheral ulcerative

keratopathy

Systemic lupus erythematosus

Therapeutic penetrating

keratoplasty

Abstract

Systemic lupus erythematosus (SLE) is a multisystem, autoimmune disorder that can have numerous ocular manifestations, which may precede or occur upon initial presentation of SLE. We report on a 72-year-old woman with peripheral corneal perforation but without any predisposing factors. SLE was diagnosed because of signs and symptoms such as arthritis, leukopenia, anemia, positive anti-dsDNA antibody, and positive antinuclear antibody (ANA). Systemic therapy with oral hydroxychloroquine 200 mg daily was prescribed. Therapeutic penetrating keratoplasty with cryopreserved cornea was also performed to repair the perforated cornea. Six months postoperatively, the corneal lesion became scarred and her visual acuity improved from 2/200 to 20/70 without any ocular or systemic recurrence. (*Tzu Chi Med J* 2009;21(2):169–171)

*Corresponding author. Department of Ophthalmology, Chang Gung Memorial Hospital, 5, Fushing Street, Gueishan, Taoyuan, Taiwan.

E-mail address: mr3756@adm.cgmh.org.tw

1. Introduction

Systemic lupus erythematosus (SLE) is a multisystem, autoimmune disorder that can have numerous ocular manifestations, which may precede or occur upon initial presentation of SLE (1). We report a patient whose ocular manifestations led to a diagnosis of SLE.

2. Case report

A 72-year-old woman visited our ophthalmologic clinic with continuous tearing of her left eye for 3 days.

The patient denied any systemic disease, but reported treatment for arthritis.

Upon examination, the visual acuity was 20/40 in the right eye and 2/200 in the left eye. Left eye biomicroscopic examination revealed conjunctival congestion, peripheral corneal melting extending from the 3 o'clock to the 5 o'clock position with iris incarceration (Fig. 1), and a shallow anterior chamber. Nasal corneal punctate epitheliopathy was present in the right eye. Both eyes had moderate cataract and normal fundi. Right eye Schirmer test measured 1 mm, while that of the left eye was asymmetrically 1 mm, probably due to microleakage of aqueous humor. Peripheral ulcerative keratitis (PUK) with corneal



Fig. 1 — Slit-lamp examination reveals conjunctival congestion, peripheral corneal melting extending from the 3 o'clock to the 5 o'clock position with iris incarceration, and a shallow anterior chamber in the left eye.

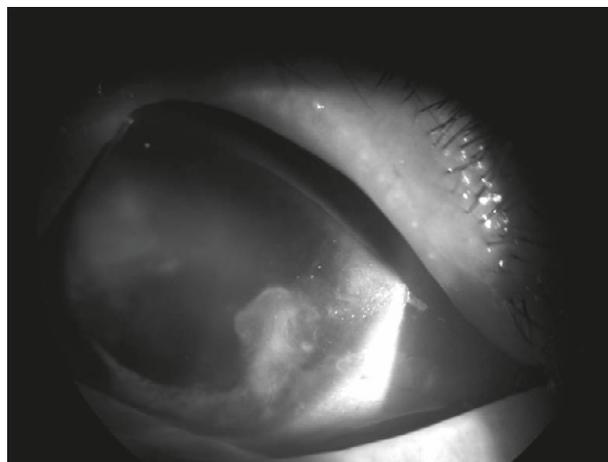


Fig. 2 — Corneal scarring without conjunctival hyperemia in the left eye 6 months postoperatively.

perforation of the left eye was diagnosed. A complete blood count revealed leukopenia and anemia. Rheumatologic studies disclosed positive antinuclear antibody (ANA), anti-dsDNA antibody, and anti-SSA and anti-SSB autoantibodies. Following a diagnosis of SLE, the patient began oral hydroxychloroquine 200 mg under the guidance of a rheumatologist.

Therapeutic penetrating keratoplasty with glycerol-preserved cornea was performed to seal the corneal perforation. The source of the graft was the remnant of the donor cornea, which was supplied by eye banks either in Taiwan or USA, previously used during penetrating keratoplasty at Chang Gung Memorial Hospital. Intraoperatively, perifocal infiltrate was scraped and sent for microbiologic investigation, which was later proved to be negative. Minimal debridement for the infiltrate was done owing to the less suppurative nature and for the purpose of being less destructive to the donor cornea. The glycerol-preserved cornea was cut to slightly oversize the perforation, approximately 5 mm × 3 mm. Lamellar dissection of the graft was also executed for an applicable thickness. Eight interrupted nylon sutures were used to secure the graft to the donor cornea. The postoperative course was uneventful. The patient was placed on a regimen of topical 0.3% gentamicin solution four times daily, 0.5% atropine daily, and sustain-tears ointment twice daily. Corneal scarring without conjunctival hyperemia was noted 6 months postoperatively (Fig. 2). The best-corrected visual acuity in the left eye was 20/70.

3. Discussion

PUK, a crescent-shaped destructive lesion of the juxtalimbal corneal stroma, is associated with epithelial

defect, presence of stromal inflammatory cells, and stromal degradation (2). It can rapidly progress to necrosis of the corneal stroma, leading to perforation and blindness (3). The extraocular significance of PUK is under-recognized, and approximately 50% of non-infectious cases of PUK are associated with collagen vascular disease (1,2). Thus, rheumatologic examinations should be studied in such cases, as was in our patient. It is important to recognize and treat PUK in the setting of systemic connective tissue disease, because serious life-threatening vasculitis has been demonstrated in these patients (3), and appropriate immunosuppressive therapy is essential to prevent blindness and premature death (2,4).

SLE is an autoimmune disease associated with severe alterations in immune regulation. The disease is characterized by a great clinical diversity, including facial rash, discoid lupus, Raynaud's phenomenon, alopecia, photosensitivity, oral and nasopharyngeal ulcers, non-deforming arthritis, nephritic syndrome, pleuritis, pericarditis, psychosis, convulsions, anemia, leukopenia and thrombocytopenia (5). The diagnosis is based on meeting four out of 11 criteria, including abnormal results on laboratory tests recommended by the American Rheumatism Association (5). The prevalence of ocular manifestations varies in unselected patients, depending on the exacerbations and remissions of the condition (6). External ocular findings in SLE include keratoconjunctivitis sicca (6), superficial punctate keratitis (7), interstitial keratitis (8,9), episcleritis (10), scleritis (11), and, rarely, PUK (1,2,8,12). Although PUK in the setting of SLE is rare, it signifies advanced disease that requires systemic control of inflammation.

It is important to distinguish PUK associated with collagen vascular disease from infectious causes of

peripheral keratitis and from Mooren's ulcer. Any local ocular infection may be associated with peripheral corneal ulceration, such as herpes simplex virus (HSV) epithelial keratitis, which in normal host immune system will be confined to a paracentral distribution. In immunocompromised patients, it has a predilection for the limbus and is seen more commonly as marginal HSV (13). Mooren's ulcer is, by definition, idiopathic and therefore cannot be associated with any systemic disorder that could contribute to the corneal pathology. There are many systemic diseases that are associated with PUK. It has been described in patients with rheumatoid arthritis (RA), Wegener's granulomatosis, relapsing polychondritis, SLE, classic polyarteritis nodosa, and its variants, microscopic polyangiitis and Churg-Strauss syndrome (11,14). Among them, RA is the most common systemic disease associated with PUK (15,16). In RA, corneal melting usually occurs in a patient with long-standing disease, that is, the same type of patient who is prone to the development of rheumatoid vasculitis—nodular, erosive, and rheumatoid factor positive. Wegener's granulomatosis also has a high rate of ocular involvement. In Wegener's granulomatosis and other forms of systemic vasculitis, corneal melting can occur earlier in the disease course. Regardless of the underlying condition, corneal melting can occur swiftly once inflammation begins within the cornea. Visual loss can ensue within days (15,16).

In our patient, arthritis, hematological disorder (leukopenia and anemia), immunological abnormality (positive anti-dsDNA antibody), and positive ANA led to a diagnosis of SLE. Secondary Sjögren's syndrome was also diagnosed because of the abnormal Schirmer test, as well as positive anti-SSA and anti-SSB autoantibodies. Systemic immune-mediated inflammation and an unstable corneal epithelium in secondary Sjögren's syndrome are potential factors that trigger the process of corneal thinning and perforation (3).

The treatment of PUK is determined by the severity of findings within the cornea and the extent of external ocular diseases (2,15). Adequate control of PUK as well as other ophthalmic manifestations of SLE requires the initiation of systemic immunosuppressive therapy. Surgical management of PUK is reserved for cases of impending perforation to preserve the integrity of the globe. Options depend on the size of the perforation and include the use of a tissue adhesive bandage contact lens, lamellar keratoplasty, or penetrating keratoplasty. In our patient, therapeutic keratoplasty and systemic hydroxychloroquine stopped the progression of PUK. The clinical success should be attributed to timely ophthalmic diagnosis and

management as well as the less severe nature of the disease.

In conclusion, it is never overemphasized that cases of ulcerative keratitis with unknown causes merit systemic, especially rheumatologic, investigation in addition to ophthalmic measures, not only to salvage the patient's sight but also to preserve their life.

References

1. Nguyen QD, Foster CS. Systemic lupus erythematosus and the eye. *Int Ophthalmol Clin* 1998;38:53-60.
2. Messmer EM, Foster CS. Vasculitic peripheral ulcerative keratitis. *Surv Ophthalmol* 1999;43:379-96.
3. Foster CS, Forstot SL, Wilson LA. Mortality rate in rheumatoid arthritis patients developing necrotizing scleritis or peripheral ulcerative keratitis: effects of systemic immunosuppression. *Ophthalmology* 1984;91:1253-63.
4. Shiuey Y, Foster CS. Peripheral ulcerative keratitis and collagen vascular disease. *Int Ophthalmol Clin* 1998;38:21-32.
5. Hochberg MC. Updating the American College of Rheumatology revised criteria for the classification of systemic lupus erythematosus. *Arthritis Rheum* 1997;40:1725. [Letter]
6. Hochberg MC, Boyd RB, Ahearn JM. Systemic lupus erythematosus: a review of clinico-laboratory features and immunogenetic markers in 150 patients with emphasis on demographic subsets. *Medicine (Baltimore)* 1985;64:285-95.
7. Spaeth GL. Corneal staining in systemic lupus erythematosus. *N Engl J Med* 1967;276:1168-71.
8. Reeves JA. Keratopathy associated with systemic lupus erythematosus. *Arch Ophthalmol* 1965;74:159-60.
9. Williams B, Hull DS. Lupus erythematosus keratoconjunctivitis. *South Med J* 1986;79:631-2.
10. Watson PG, Hayreh SS. Scleritis and episcleritis. *Br J Ophthalmol* 1976;60:163-91.
11. Ladas JG, Mondino BJ. Systemic disorders associated with peripheral corneal ulceration. *Curr Opin Ophthalmol* 2000;11:468-71.
12. Gold DH, Morris DA, Henkind P. Ocular findings in systemic lupus erythematosus. *Br J Ophthalmol* 1972;56:800-4.
13. Kremer I, Wagner A, Shmuel D, Yussim A, Shapira Z. Herpes simplex keratitis in renal transplant patients. *Br J Ophthalmol* 1991;75:94-6.
14. McKibrin M, Isaacs JD, Morrell AJ. Incidence of corneal melting in association with systemic disease in the Yorkshire Region, 1995-7. *Br J Ophthalmol* 1999;83:941-3.
15. Tauber J, Sainz de la Maza M, Hoang-Xuan T, Foster CS. An analysis of therapeutic decision making regarding immunosuppressive chemotherapy for peripheral ulcerative keratitis. *Cornea* 1990;9:66-73.
16. Sainz de la Maza M, Foster CS, Jabbur NS, Baltatzis S. Ocular characteristics and disease associations in scleritis-associated peripheral keratopathy. *Arch Ophthalmol* 2002;120:15-9.