Severe Vaso-occlusive Retinopathy as the Primary Manifestation in a Patient with Systemic Lupus Erythematosus

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Severe vaso-occlusive retinopathy as the initial manifestation of systemic lupus erythematosus (SLE) is rare. We report a 16-year-old female who developed bilateral visual impairment. Fundus examinations showed bilateral "cherry-red spot" appearance, multiple confluent cotton wool spots, and widespread arterial occlusion. Laboratory studies showed leukopenia, antinuclear antibody (+), and anti-double-stranded DNA antibody (+). Malar rashes, oral ulcers, and bilateral knee joint tenderness were noted during physical examination. SLE was diagnosed and pulse therapy started immediately. Best corrected visual acuity of the left eye improved to 6/10 after treatment. However, there was no visual improvement in the right eye. Four months later, bilateral panretinal laser photocoagulation was performed due to retinal neovascularization. However, tractional retinal detachment of the right eye and vitreous hemorrhage of the left eye still occurred. After undergoing cryoretinopexy of the right eye and intravitreous tissue plasminogen activator injection of the left eye, the visual acuity of the patient's right eye remained hand movement only at 10 cm, but that of the left eye returned to 6/10. The ocular and systemic conditions were stable in the follow-up period of more than 2 years. This case demonstrates that in patients with severe vaso-occlusive retinopathy, a generalized immunological disorder, like SLE, should be suspected. [*J Chin Med Assoc* 2008;71(7):377–380]

Key Words: autoimmune diseases, lupus retinopathy, systemic lupus erythematosus, vasculitis, vaso-occlusive retinopathy

Introduction

Systemic lupus erythematosus (SLE) is an autoimmune disease characterized by immune dysregulation resulting in the production of antinuclear antibody (ANA), generation of circulating immune complexes, and activation of the complement system.[1] Its clinical manifestations are diverse, with musculoskeletal and cutaneous manifestations being the most common.[2] The most common ophthalmic presentation in patients with SLE is retinopathy with microangiopathy, which presents with cotton wool spots with or without intraretinal hemorrhage.[2] However, severe vaso-occlusive retinopathy as the initial manifestation of SLE is relatively rare.[3] There have been fewer than 50 patients previously reported in the literature,[3–7] and there has been no previous case described in Taiwan. We report a 16-year-old female who suffered from sudden vision loss associated with severe vaso-occlusive retinopathy, which led to the diagnosis of SLE.

Case Report

This 16-year-old female, who lived in Ping Tung, was well previously. She suffered from sudden onset of bilateral vision loss in the interval of 1 week and was referred to our clinic on January 20, 2005. Her best corrected visual acuity was counting fingers at 30 cm in the right eye and 6/60 in the left eye. The anterior segment and vitreous were clear. No tear film insufficiency or scleral inflammation was noted. Fundus examination

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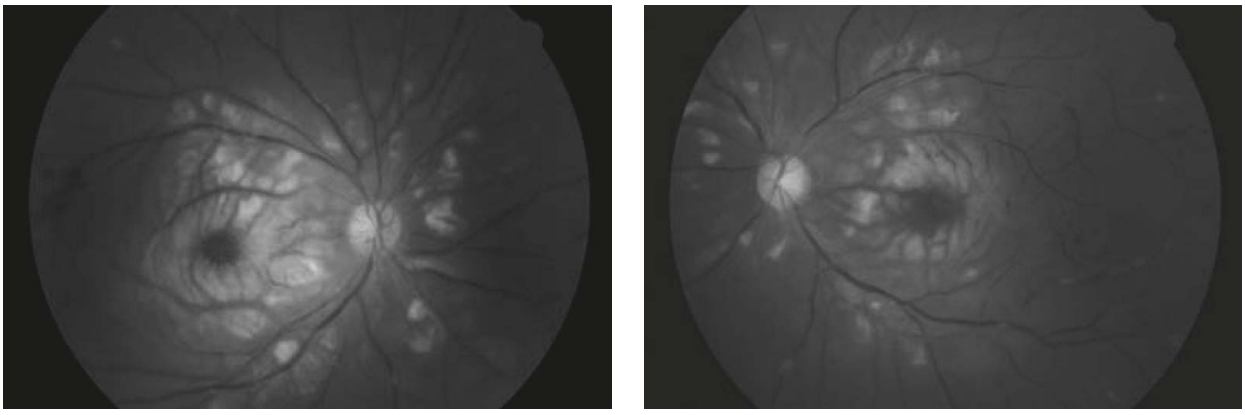

Figure 1. Color fundus pictures at presentation showed diffuse, confluent cotton wool spots predominantly in the posterior pole.

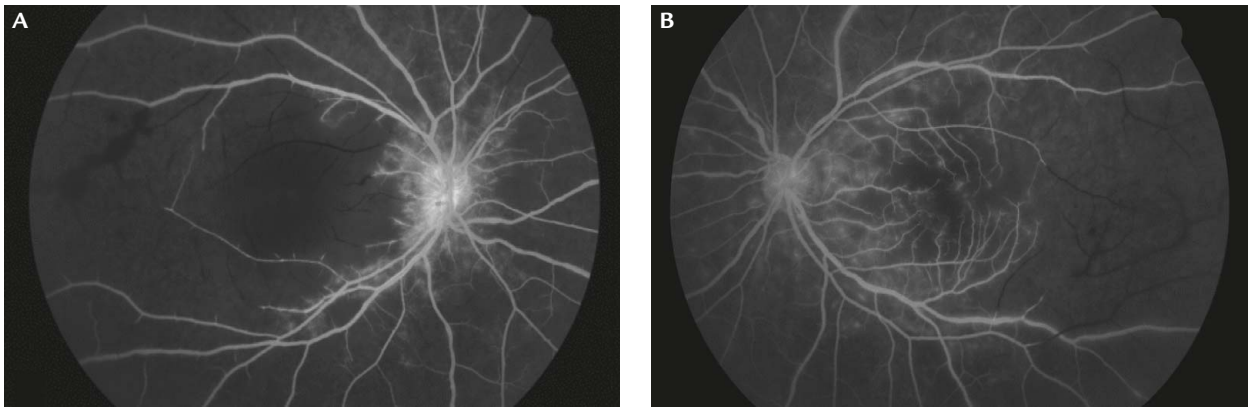

Figure 2. Fluorescence angiography revealed complete obliteration of the macular capillary and widespread occlusion in smaller vessels, with only the larger retinal vessels showing perfusion. The right eye (A) was more severe than the left eye (B).

showed bilateral extensive cotton wool spots (Figure 1). Fluorescence angiography of the right eye revealed complete obliteration of the macular capillary and widespread occlusion in the smaller vessels, with only the larger retinal vessels showing perfusion (Figure 2A). There was a similar picture in the left eye, with partial sparing of the vascular network around the central macula (Figure 2B).

Laboratory studies disclosed leukopenia. Elevated ANA titer with a speckled (1:1,280) pattern was also noted. The anti-double-stranded DNA (anti-ds DNA) antibody titer was 9.13 μg/mL (normal, < 7 μg/mL), and complement levels of C3 and C4 were reduced. Malar rashes, oral ulcers, and bilateral knee joint tenderness were also noted. However, the tests for anticardiolipin antibodies and lupus anticoagulant antibodies were negative. SLE was diagnosed according to the revised American College of Rheumatology (ACR) classification criteria.[8]

Intravenous steroid pulse therapy was prescribed immediately. Visual acuity of the left eye improved to 6/10 after treatment. However, there was no visual improvement in the right eye. Thereafter, the patient's condition stabilized under oral antimalarial drugs and steroid prescribed by a rheumatologist.

Four months later, retinal neovascularization developed in both eyes. Although panretinal photocoagulation was applied to both retinas, the disease continued to progress. Seven months later, advanced tractional retinal detachment of the right eye and vitreous hemorrhage of the left eye occurred. The patient suffered from bilateral vision loss again. After undergoing cryoretinopexy of the right eye and intravitreous tissue plasminogen activator (t-PA) injection of the left eye, the visual acuity of the right eye remained hand movement only at 10 cm, but that of the left eye returned to 6/10. She has been regularly followed-up at the ophthalmologic and rheumatologic clinics for more than 2 years; her ocular and systemic conditions have remained stable (Figure 3).

Discussion

SLE is a chronic, usually life-long, potentially fatal autoimmune disease characterized by unpredictable

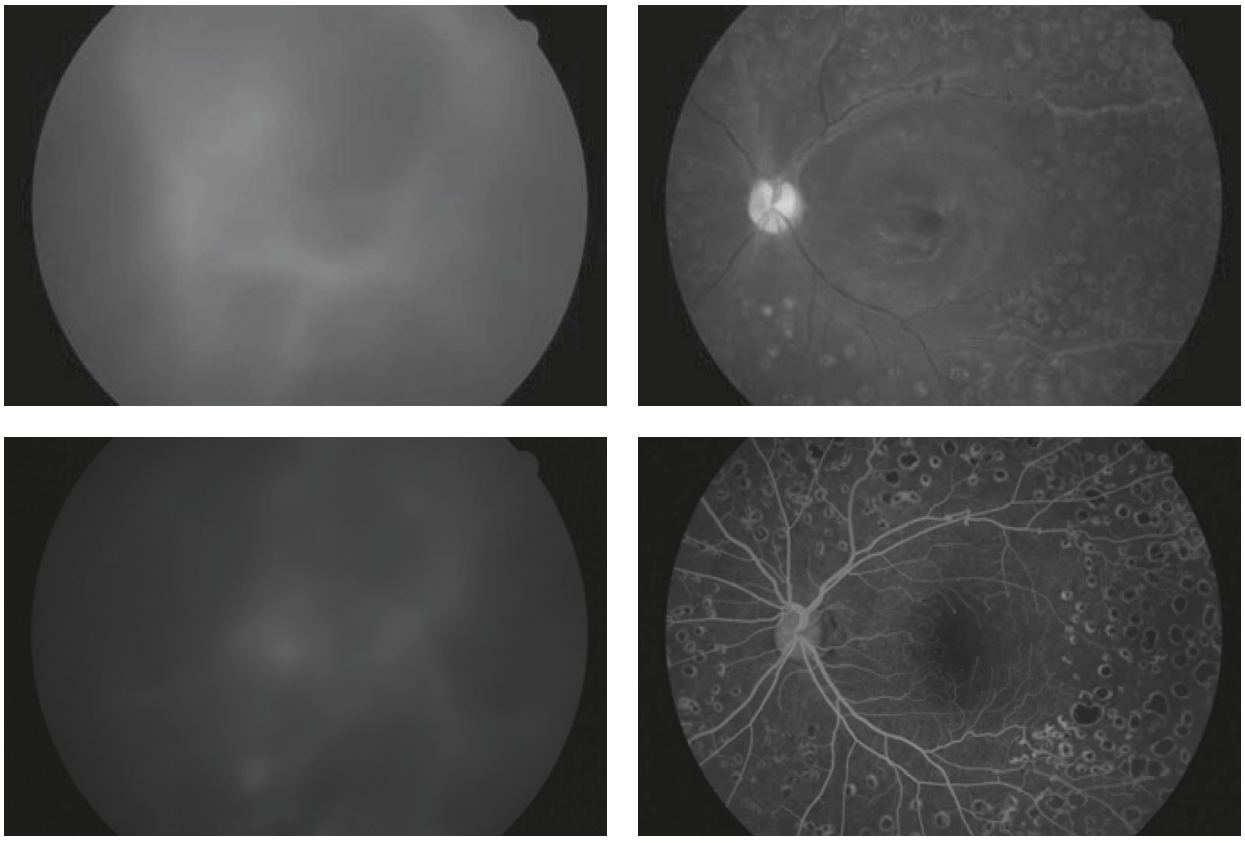

Figure 3. Color fundus pictures (upper) and fluorescence angiography (lower) 2 years later. Tractional retinal detachment of the right eye and panretinal photocoagulation over the left eye were observed.

exacerbations and remissions with protean clinical manifestations. In SLE, there is a predilection for clinical involvement of the joints, skin, kidney, brain, eye, serosa, lung, heart and gastrointestinal tract. It is most common in women of child-bearing age. The etiology of SLE remains unknown. Disease manifestations result from recurrent vascular injury due to immune complex deposition, leukothrombosis, or thrombosis.[2]

Severe tear deficiency, scleral inflammation, and retinal vasculopathy are hallmarks of ophthalmic involvement in SLE. The most common fundus findings in SLE are cotton wool spots, retinal hemorrhage, vasculopathy, and optic disc edema.[9–11] Severe vaso-occlusive retinopathy is a relatively rare form of retinopathy in SLE that often affects the smaller retinal arteries and arterioles. There have been fewer than 50 patients reported previously.[3–7] About 70% of these patients were affected bilaterally.[3–7] Diffuse and widespread arteriolar or branch arterial occlusion, capillary non-perfusion, and severe retinal ischemia often resulted. The pathologic basis for this severe vaso-occlusive retinopathy has been considered an immune complex-mediated vasculopathy, based on previous reports of immune complex deposition in retinal vessels in SLE. Rather than a true inflammatory vasculitis, the retinal vascular disease is thought to stem from fibrinoid degeneration with necrosis of the vessel walls.[12–14] Histologic findings have described fibrinoid change with thrombosis in the vessel walls without evidence of inflammation.[15] However, the precise nature of these occlusive lesions remains unclear.

Since the ocular complications of SLE are generally associated with active disease elsewhere in the body, control of the systemic disease may lead to resolution of the ocular manifestations. Some oral medications (e.g. nonsteroidal anti-inflammatory agents, antimalarial therapy, immunosuppressive agents, antiplatelet treatment, steroids) may be helpful in the treatment of SLE.[12] Systemic therapy with steroid is required when severe manifestations of SLE such as vaso-occlusive retinopathy are present.[12] In this case, intravenous steroid pulse therapy was prescribed in the beginning to stabilize the acute stage of the disease. Thereafter, antimalarial drugs and low-dose steroid were given to control the disease activity of SLE.

Treatment of SLE retinopathy is aimed at preventing complications arising from neovascularization. A significant factor affecting visual outcome is the high

rate of neovascularization and vitreous hemorrhage arising from retinal ischemic events. Panretinal photocoagulation and vitrectomy have been found to be useful in preserving vision.[12] In this case, the early intervention with bilateral panretinal photocoagulation may be considered to have prevented complications arising from neovascularization.

Vision loss is an important issue in vaso-occlusive retinopathy of SLE. In 50% of SLE patients with this type of vaso-occlusive retinopathy, visual acuity was less than 6/20.[3–7] In this case, the visual acuity of the right eye was hand movement at 10 cm. The visual prognosis is poor, as reported in the literature.[3–7] This case highlights the importance of timely treatment to prevent further vision loss.

Additionally, the association between severe vaso-occlusive retinopathy in SLE and the presence of antiphospholipid antibodies has been noted.[9,16–19] In 50 SLE patients presenting with vaso-occlusive retinopathy, more than 10 were associated with antiphospholipid antibodies.[8–11,16] The antiphospholipid syndrome is well recognized in SLE. Tests for antiphospholipid antibodies should be performed in patients with severe vaso-occlusive retinopathy, especially if they have an associated lupus-like syndrome or features of the antiphospholipid syndrome. However, the tests for antiphospholipid antibodies were negative in this case and antiphospholipid syndrome could be ruled out.

In conclusion, we described a 16-year-old female who presented with a rare but visually devastating form of retinopathy characterized by severe extensive retinal arteriolar occlusions. Visual acuity of the left eye improved after treatment, but there was no visual improvement in the right eye due to tractional retinal detachment. This case reminds us that in patients with severe vaso-occlusive retinopathy, a generalized immunologic disorder, like SLE, should be taken into consideration.

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