Intravenous Cyclophosphamide and High Dose Corticosteroids Improve MRI Lesions in Demyelinating Syndrome in Systemic Lupus Erythematosus

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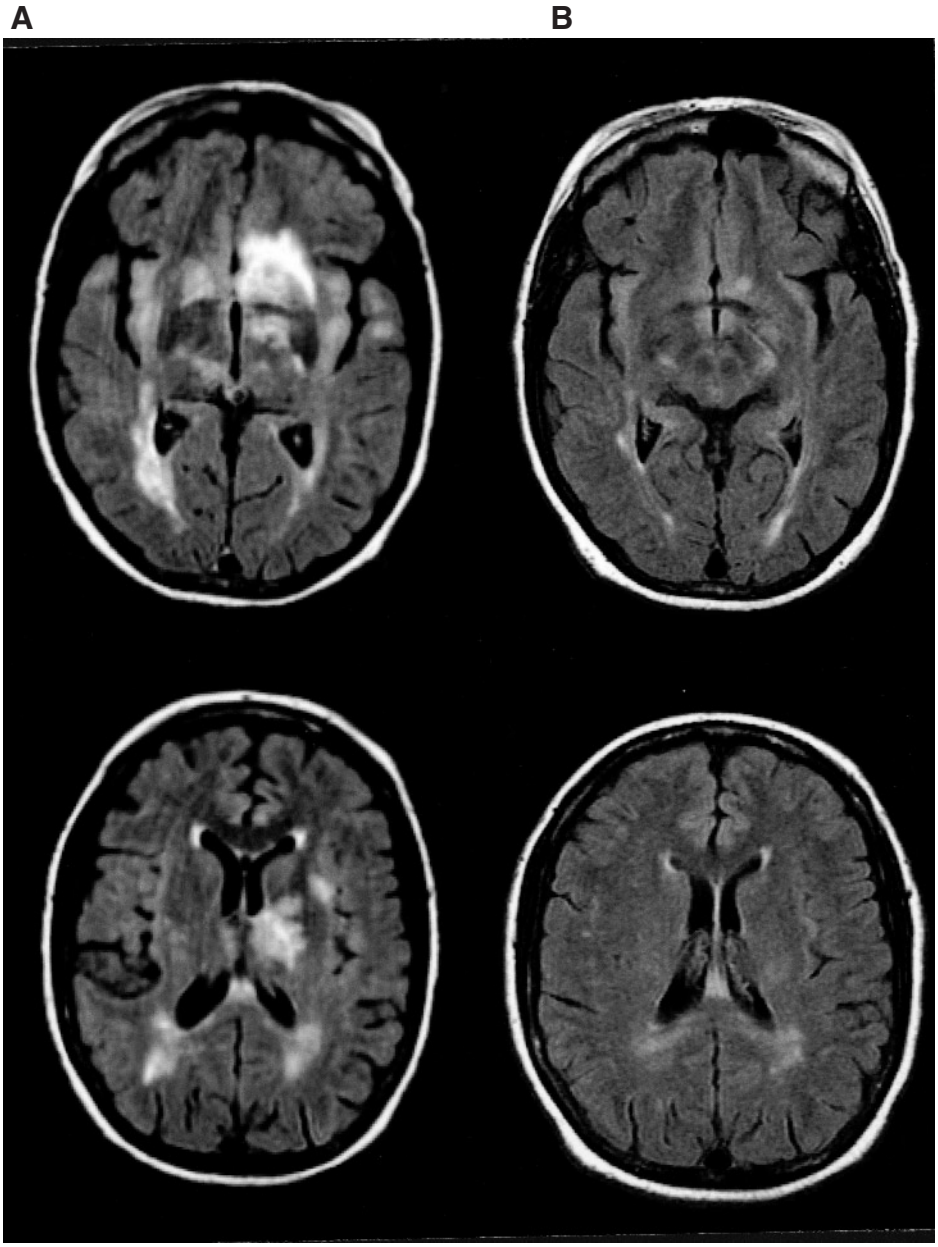

Figure 1. A. (left panels) June 2000, prior to therapy. B. (right panels) December 2000, following monthly IV cyclophosphamide and high dose steroids.

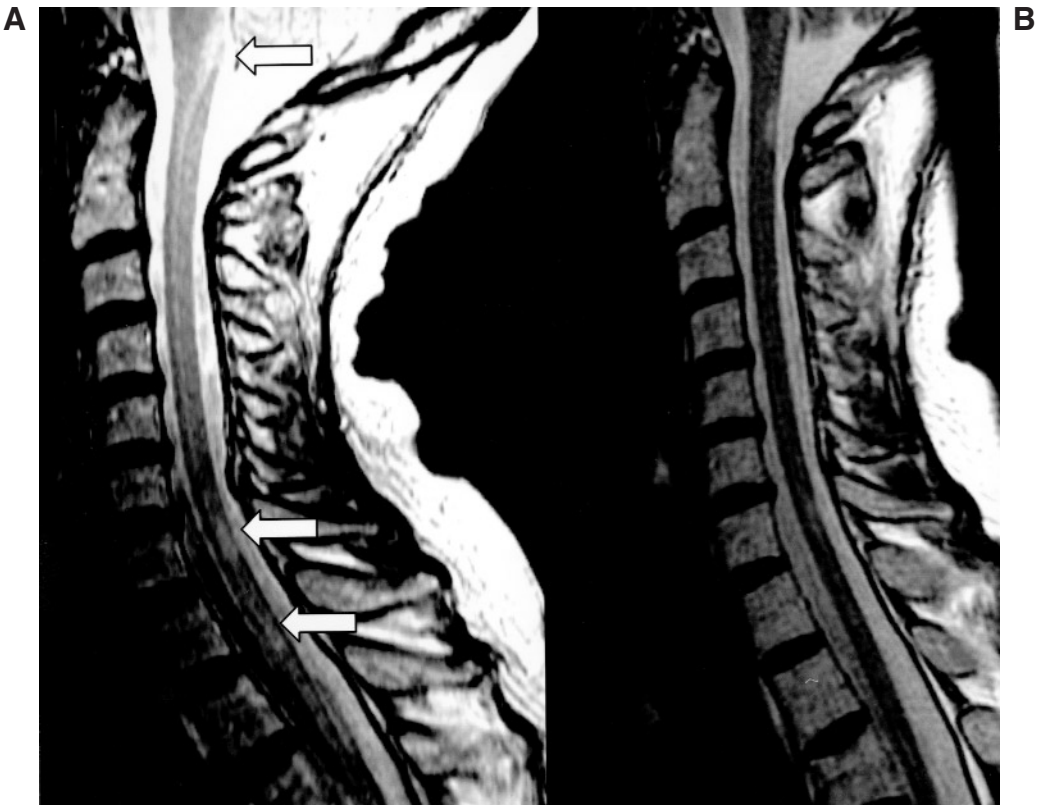

Figure 2. Left panel: May 2001, the patient is taking maintenance prednisone and methotrexate. Right panel: November 2001, after monthly IV cyclophosphamide and high dose steroids.

A 52-year-old woman was diagnosed with systemic lupus erythematosus (SLE) in 1994, based on the presence of a discoid lupus rash, photosensitivity, positive antinuclear antibody, positive anti-dsDNA antibody, and false-positive VDRL. She had alopecia, a vasculitic rash, Raynaud's phenomenon, and a positive anti-Ro antibody. In 1997, she developed numbness and spasticity in her legs. Magnetic resonance imaging (MRI) of the brain showed lesions with increased signal in her medulla and spinal cord at the T1 and T2 level. A lumbar puncture revealed slightly elevated protein with no oligoclonal bands and no cells. She was diagnosed with a demyelinating syndrome[1] and therapy was initiated with intravenous (IV) pulse methylprednisolone 1 g OD for 3 days, followed by oral prednisone, with improvement in her neurological function. Azathioprine was started but was discontinued due to elevated liver function tests.

An MRI of the brain in December 1999 showed only mild periventricular white matter lesions and focal white matter changes in the frontal lobe. In June 2000, she developed worsening neurological symptoms while the prednisone was tapered. An electroencephalogram showed diffuse epileptiform abnormalities, but there were no clinical seizures. An MRI of the brain showed worsening demyelinating disease with new and enlarging high signal lesions on T2 images (Figure 1A). Therapy was started with IV cyclophosphamide at a dose of 750 mg/m^2 and IV methylprednisolone 1 g OD for 3 days, followed by prednisone 30 mg OD. After 6 months of prednisone and monthly IV cyclophosphamide, an MRI of her brain and spinal cord was repeated. This showed significant improvement in the periventricular white matter lesions as well as in the pons, midbrain, and medulla (Figure 1B). She was maintained on prednisone, and oral methotrexate (MTX) 15 mg per week was added.

In May 2001, she developed worsening unsteadiness and weakness in her legs. An MRI of the spinal cord showed increased T2 signal lesions in the cervical and upper thoracic spinal cord (Figure 2A). She was restarted on monthly IV cyclophosphamide 750 mg/m^2 and high dose steroids for 6 months; the MTX was discontinued. A repeat spinal cord MRI in November 2001 showed improvement in the lesions (Figure 2B). She was maintained on IV cyclophosphamide every 3 months in addition to prednisone.

In July 2002, she again developed worsening neurological symptoms, and a repeat MRI of the brain and spinal cord showed new white matter lesions (Figure 3A). She was treated with IV pulse steroids, and the IV cyclophosphamide was increased to monthly administrations for 3 months. Repeat MRI in October 2002 showed improvement in the brain and spinal cord lesions (Figure 3B).

We have described 3 separate episodes of worsening neurological function in a patient with demyelinating syndrome in lupus. The episodes were associated with worsening changes on MRI, which improved after treatment with

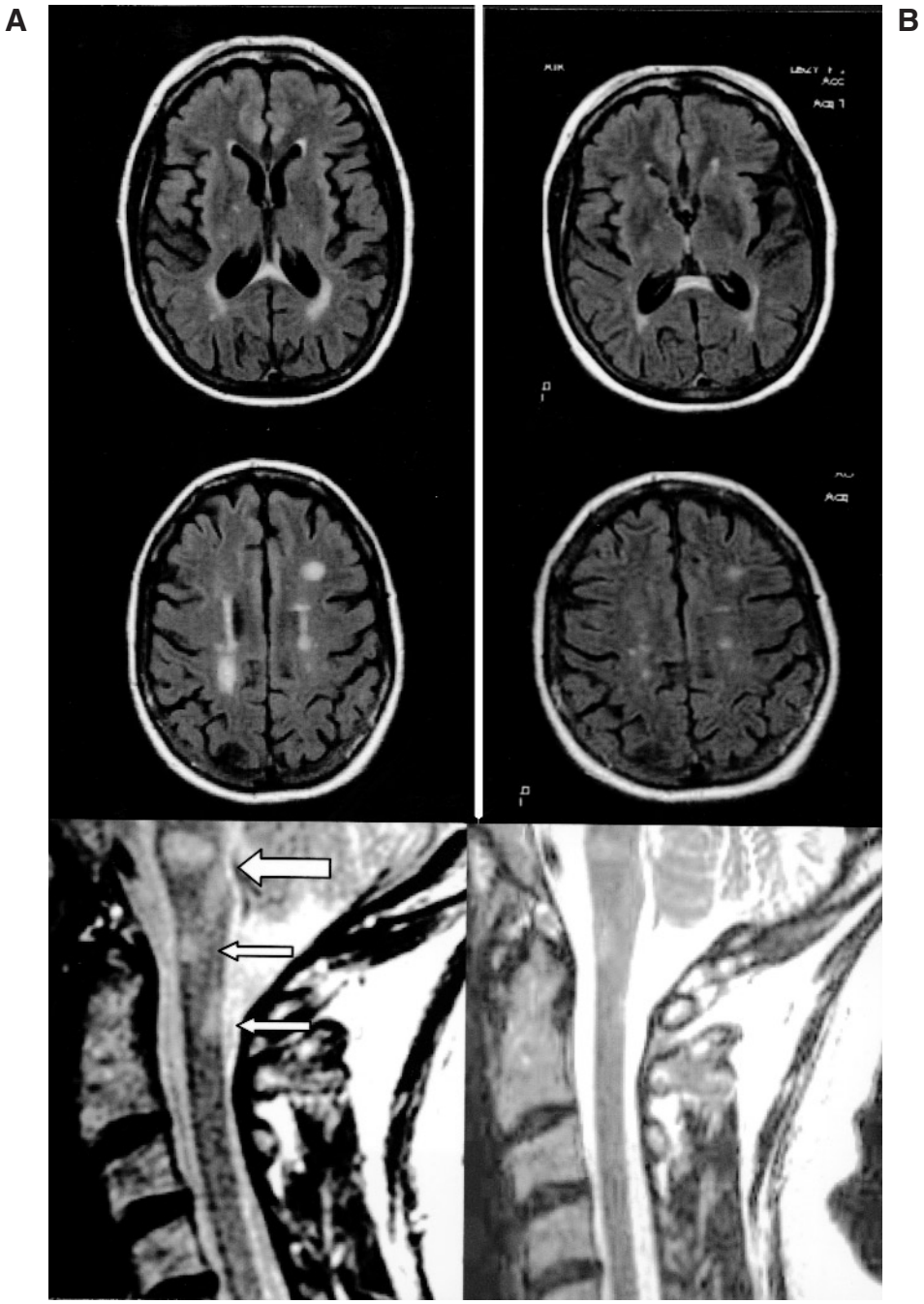

Figure 3. A. (left panels) July 2002, Patient receiving maintenance IV cyclophosphamide every 3 months and prednisone. B. (right panels) October 2002, after monthly IV cyclophosphamide and high dose steroids.

IV cyclophosphamide and high dose corticosteroids. Although the findings are from a single patient, they suggest that the MRI lesions in demyelinating syndrome are responsive to this therapy. It has been suggested that early treatment with cyclophosphamide and high dose corticosteroids improves the prognosis in patients with demyelinating syndrome in lupus[2,3]. The improvements in MRI findings also indicate that serial MRI may be useful in assessing response to treatment.

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