Jaw Dystonia and Reversible Basal Ganglia Changes as an Initial Presentation of Systemic Lupus Erythematosus

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Abstract

Dystonia as a manifestation of neuropsychiatric lupus erythematosus (NPSLE) is uncommon. We report a 25-year-old woman who experienced progressive confusion, reduced speech, and difficulty opening her mouth approximately 2 weeks after development of a facial rash. Brain imaging showed bilateral, symmetric signal abnormalities within the basal ganglia and sub-cortical white matter. Despite treatment with high-dose steroids, she continued to have difficulty speaking with evidence of jaw dystonia on examination. Jaw dystonia rapidly improved with the initiation of levodopa. Repeat evaluation 3 months later exhibited the absence of jaw dystonia and near resolution of the imaging abnormalities. Our patient demonstrated a unique presentation with jaw dystonia refractory to traditional treatment for NPSLE. Such a presentation likely represents a severe variant of NPSLE requiring both immunosuppressive and symptomatic therapies.

Keywords

movement disorders, clinical specialty, neuroimmunology, dystonic disorders, parkinsonian disorders, imaging techniques

Introduction

Systemic lupus erythematosus (SLE) is a chronic autoimmune disorder with multi-organ system involvement, including both the central and peripheral nervous systems. The term “neuropsychiatric lupus erythematosus” (NPSLE), developed by the American Academy of Rheumatology in 1999, describes central and peripheral nervous system abnormalities that have been observed in SLE.¹ The reported prevalence of NPSLE is highly variable, ranging from 14% to 95%,¹⁻⁹ and has been associated with reduced quality of life and increased mortality in both children and adults.¹⁰⁻¹²

There is a wide range of clinical manifestations of NPSLE, with headaches, mood disorders, and seizures occurring most frequently. Movement disorders can also occur, but are rare, with an estimated cumulative incidence of 0.6%.¹³ Chorea is the most commonly encountered movement disturbance in NPSLE.^{14,15} Our case report illustrates severe jaw dystonia as an initial manifestation of SLE, with rapid improvement following initiation of levodopa.

Case Description

A 25-year-old African American woman, 4 months postpartum with no history of SLE, presented to the hospital with 2 weeks of malar rash, progressive confusion, and jaw

dystonia. Physical examination was notable for a lethargic woman with difficulty following commands, hyperpigmented maculopapular rash overlying her cheeks, and inability to fully open her mouth, with features similar to oromandibular dystonia. There was no exposure to agents causing acute dystonia prior to her presentation. Brain magnetic resonance imaging (MRI) demonstrated symmetric abnormalities seen on T2-weighted and fluid-attenuated inversion recovery (FLAIR) sequences within the bilateral basal ganglia and periventricular white matter (Figure 1A), with T1-weighted associated hyperintensity (Figure 1B) and correlating areas of focal ischemia on diffusion-weighted images. Both head magnetic resonance angiogram and venogram were unremarkable. Cerebral spinal fluid analysis revealed zero red blood cells, mild lymphocytic predominant pleocytosis (14 nucleated cells/ μ L), glucose 56 (serum glucose 91), and elevated protein (89 mg/dL). Serum laboratory results were notable for positive anti-nuclear antibody with speckled pattern 1:320, strongly

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Figure 1. Brain magnetic resonance imaging (MRI) at initial presentation. A, T2-weighted and fluid-attenuated inversion recovery (FLAIR) axial image of the bilateral basal ganglia lesions at initial presentation. B, T1-weighted axial image with basal ganglia hyperintensity with associated susceptibility.

positive anti-Smith/ribonuclear antibody, anti-Sjögren syndrome-related antigen A antibody, and low C3 complement level 27 (normal range: 87-247). Anti-double-stranded DNA was negative and antichromatin was indeterminate. Antiphospholipid antibodies were initially notable for elevated anticardiolipin immunoglobulin (Ig) M 18 (normal range: 0-14), while negative for anticardiolipin immunoglobulin (Ig) A/G and anti- β -2-glycoprotein 1 IgM/IgG. She did not meet criteria for antiphospholipid syndrome, and repeat antiphospholipid antibody panel 6 months later was negative. Antineuronal antibodies were not checked. Anti-N-methyl-D-aspartate receptor antibody was sent and returned negative.

She met 2012 Systemic Lupus International Collaborating Clinics diagnostic criteria for SLE. She received intravenous methylprednisolone on hospital day (HD) 3 (1 g/d for 5 days) along with intravenous cyclophosphamide (HD 7) followed by high-dose oral prednisone (HD 8), beginning at 60 mg/d and tapering down over 6 weeks.

Her jaw dystonia persisted throughout the hospitalization. She failed repeated bedside swallow evaluations and required nutrition through a nasogastric feeding tube. She was then started on 0.5 tablet of 25/100 mg carbidopa/levodopa 3 times daily on HD 9, titrating up by 0.5 tablet with each dose until reaching 3 tablets 3 times daily on HD 14. Hydroxychloroquine was started on HD 10. Her jaw dystonia rapidly improved, allowing her to pass a bedside swallow examination within 24 hours of starting levodopa. She was tapered off levodopa on HD 17, 8 days after starting, due to the development of manic symptoms and choreiform movements. She received bimonthly infusions of cyclophosphamide for the following 6 weeks before being transitioned over to mycophenolate mofetil. Her mental status slowly improved throughout

the course of the hospitalization with return to baseline within 3 to 4 weeks after initial presentation.

At her 3-month follow-up visit, she remained without recurrence of the jaw dystonia or cognitive impairment. She was maintained on mycophenolate mofetil 1000 mg twice daily, hydroxychloroquine 200 mg daily, and aspirin 81 mg daily and was slowly weaning to low-dose oral prednisone. Repeat brain MRI at 3 months showed near-complete resolution of the bilateral basal ganglia T2/FLAIR abnormalities (Figure 2A), with minimal residual hyperintensity on T1-weighted imaging (Figure 2B). The patient consented to publication of this case report.

Discussion

Neuropsychiatric manifestations of systemic lupus erythematosus are not infrequent. An estimated 40% of NPSLE symptoms occur before the onset of SLE, while greater than 60% of patients experience NPSLE within the first year of SLE diagnosis.⁶

Other than chorea, hyperkinetic movement disorders in NPSLE are rare but have been described in several case reports.¹⁶ There have also been reports of hemifacial spasm, stiff person syndrome, and cervical dystonia associated with NPSLE.^{15,17-20} To our knowledge, our case illustrates the first report of severe jaw dystonia as an initial manifestation of SLE.

The pathogenesis of NPSLE remains unknown but is likely multifactorial arising from a combination of microvascular changes, inflammatory mediators, and autoantibody production. Antiribosomal P antibodies have been associated with diffuse NPSLE, such as psychosis, whereas antiphospholipid

Figure 2. Brain magnetic resonance imaging (MRI) performed at 3-month follow-up. A, T2-weighted and fluid-attenuated inversion recovery (FLAIR) axial image with a resolution of previous basal ganglia hyperintensities. B, T1-weighted axial image with minimally persistent basal ganglia hyperintensity.

antibodies have been implicated in focal neurologic deficits, such as stroke and parkinsonism.^{10,16,21,22} Antiphospholipid antibodies have been reported in up to 50% of SLE-related parkinsonism.²³⁻²⁵

In contrast to our case where jaw dystonia correlated with bilateral basal ganglia changes on MRI, imaging findings in NPSLE are not always well localizable. The MRI changes encountered in NPSLE most frequently include small nonspecific white matter abnormalities in the frontoparietal region (15%-60%), followed by cortical atrophy, periventricular white matter changes, ventricular dilatation, and infarcts.²⁶ The MRI changes are more frequent and sometimes more severe in those who are antiphospholipid positive, occurring in up to 75%, including cerebral infarcts, small focal lesions, or white matter changes similar to multiple sclerosis.²⁷⁻²⁹

Although basal ganglia changes on imaging are estimated to occur in 50% of SLE-related parkinsonism,^{25,30,31} severe oromandibular dystonia with basal ganglia abnormalities has not been reported.

A variety of treatment methods have been trialed for SLE-induced movement disorders, including high-dose corticosteroids,^{16,32} immunosuppression with high-dose corticosteroids,^{14,16,25,30} levodopa monotherapy,^{16,24} or corticosteroids combined with levodopa with varying results.^{16,23,33} The rapid improvement of jaw dystonia in our patient with the addition of levodopa to steroids suggests an additional symptomatic effect of levodopa with immunosuppressive therapy.

Although immunosuppression is the hallmark of therapy for SLE and associated neuropsychiatric manifestations, levodopa may provide effective symptomatic relief for the

movement disorders in NPSLE, such as jaw dystonia illustrated in this case report.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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