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Neuromyelitis Optica Spectrum Disorder in a Patient with Ankylosing Spondylitis

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Dear Editor,

Ankylosing spondylitis (AS) is a chronic inflammatory disease of the axial skeleton. Extraskeletal manifestations such as uveitis and inflammatory bowel disease are sometimes seen. Neurological manifestations are rare and usually develop secondary to bony structure deformity. Although the occurrence of nonstructural central nervous system (CNS) demyelinating disease has been reported occasionally, the coexistence of AS and neuromyelitis optica spectrum disorder (NMOSD) has not been reported previously.[1-3]

A 52-year-old woman attended our neurology department with a 1-month progression of both paresthesia and weakness of the leg. She had been diagnosed with human leukocyte antigen B27 (HLA-B27)-negative AS with characteristic back pain and bilateral sacroiliitis (Fig. 1A and B). She had taken only celecoxib. Magnetic resonance imaging (MRI) showed high signal intensity within the spinal cord from T10 to the conus medullaris on T2-weighted imaging (T2WI), predominantly involving the central portion of the spinal cord (Fig. 1C and D). Cerebrospinal fluid findings including oligoclonal bands were within normal limits. The patient exhibited negativity for anti-Ro, anti-La, antineutrophil cytoplasmic antibody, anti-ds-DNA, and antineuronal antibodies such as anti-Hu and anti-Yo, and weak positivity for antinuclear antibody. Anti-aquaporin-4 (AQP4) antibody testing using a cell-based assay produced negative findings. Brain MRI showed high signal intensity in the white matter of the left occipital lobe on T2WI, without gadolinium enhancement (Fig. 1E). We prescribed intravenous methylprednisolone, which produced positive results. Immunosuppressant drugs other than steroids were not administered.

Three months later, the patient attended the clinic complaining of paresthesia below the T4 level and aggravated leg weakness. Follow-up MRI showed high signal intensity within the spinal cord from T1 to T3 on T2WI (Fig. 1F and G). She was still negative for anti-AQP4 antibody. She partially recovered and could walk without assistance after intravenous methylprednisolone, and was then started mycophenolate mofetil to prevent further attacks. Three months later, she again attended the clinic with intractable hiccup and nausea. Brain MRI revealed a tiny lesion at the dorsal medulla (Fig. 1H). Based on all of her signs and symptoms, we diagnosed her with NMOSD without anti-AQP4 antibody in accordance with the revised diagnostic criteria.[4] We prescribed rituximab to prevent a relapse.[5] She has been doing well without recurrence since the last attack.

Our case meets the modified New York criteria for AS and the revised diagnostic criteria for NMOSD. To determine whether this was the first reported case of NMOSD in a patient with AS, we thoroughly reviewed the literature for reports on the coexistence of AS and CNS demyelinating disease, and none were found that fulfilled the NMOSD diagnostic criteria.[1-3]

In 1986, Pillay and Hunter[6] reported an increased prevalence of abnormal evoked potentials in patients with AS and suggested that the frequency of optic neuritis might be increased in these patients. A recent study conducted in China found that the prevalence of AS in

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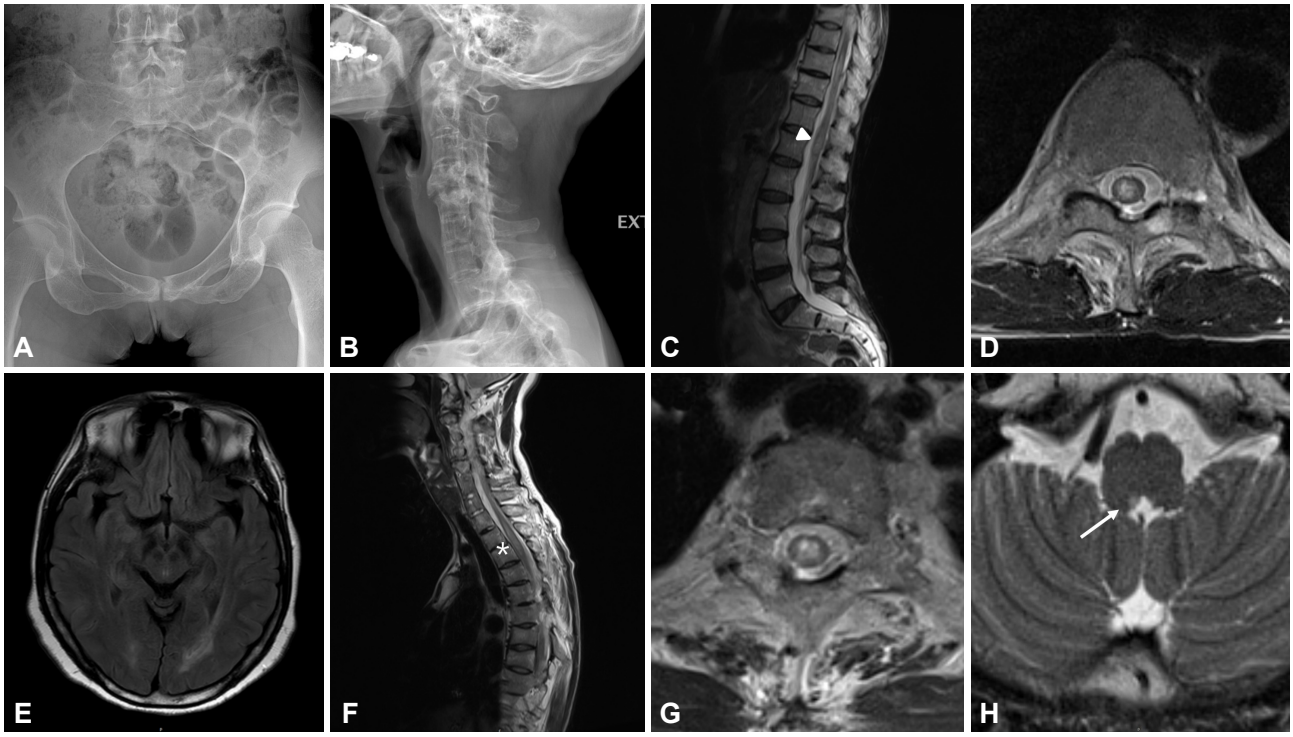

Fig. 1. A and B: Pelvic and C-spine x-rays showing sacroiliitis and bamboo spine, respectively. C and D: Spine MRI images showing high signal intensity on T2WI from T10 to the conus medullaris at the first attack (arrowhead). E: Brain MRI image showing high signal intensity on T2WI in the left occipital lobe at the first attack. F and G: Spine MRI image showing high signal intensity on T2WI from T1 to T3 at the second attack (asterisk). H: Brain MRI image showing high signal intensity on T2WI in the right dorsal medulla at the third attack (arrow). MRI: magnetic resonance imaging, T2WI: T2-weighted imaging.

HLA-B27-positive optic neuritis patients was 0.7%, which is slightly higher than the reported range of 0.2% to 0.54% in Han Chinese.[3] Despite these results, we cannot presume an association between AS and NMOSD due to a lack of epidemiological studies. Since the coexistence of these two diseases might be coincidental, further studies aimed at better understanding their coexistence are warranted.

AS and NMOSD share an obscure pathogenesis, while a T-cell-based autoimmunity is a possible explanation for the disease process considering the recently emerging role of T-cells in NMOSD. A current genome-wide association study found no common susceptibility genetic loci for AS and NMOSD.[7,8] Molecular mimicry might be an environmental factor that results in copathogenesis, although no information is available about common antigens. Systemic autoimmunity might facilitate crucial events in NMOSD immunopathogenesis, such as the production of autoantibodies or other inflammatory mechanisms leading to disruption of the blood-brain barrier.

In conclusion, this is the first report of a case with the coexistence of AS and NMOSD. Future studies are needed to elucidate the relationship between these two diseases.

Conflicts of Interest

The authors have no financial conflicts of interest.

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