Neuromyelitis optica spectrum disease (NMO) refers to a group of related diseases, in which potential pathogenesis is similar to neuromyelitis optica (NMO), but clinical involvement does not exactly correspond to the diagnosis of NMO. Owing to varied clinical manifestations, it is apt to be misdiagnosed. We report a case of NMO with cervical spondylosis and discuss the experience of diagnosis.

A 44-year-old woman was admitted to our hospital with a 10-day history of ache of both upper limbs and numbness on the trunk below the chest and bilateral thighs. Ten days before, she had an onset of ache of double upper limbs without apparent inducement. At the same time, she developed trembling on hands when writing and numbness between the chest and bilateral knees, which were unable to be alleviated. At admission, she presented with hypoesthesia of superficial sensibility from bilateral costal margins to knees, positive bilateral Hoffmann sign, and Babinski sign. Magnetic resonance imaging (MRI) [Figure 1a] of cervical vertebrae showed: (1) Cervical intervertebral disc herniation (C3–C7); (2) Intramedullary lesions with edema (C2–T2); (3) Cervical spondylolisthesis (C3–C5). She was admitted to our hospital with a presumptive diagnosis of cervical spondylolisthesis and intramedullary lesions with edema (C2–T2). After admission, she was given dehydration, anti-inflammatory, nerve nutrition, and symptomatic treatment immediately. Subsequent lumbar puncture showed results of cerebrospinal fluid routine were normal with normal protein, glucose, and chloride levels. Serum aquaporin-4 (AQP-4) antibody was tested by enzyme-linked immunosorbent assay and showed positive. Also, visual evoked potential, brainstem auditory evoked potential, and somatosensory evoked potential were normal. All told that she was diagnosed as NMO and cervical spondylolisthesis. Then, she received methylprednisolone (500 mg) impact therapy and sequential reduction of hormone therapy. Fifteen days later, MRI [Figure 1b] showed cervical and thoracic spinal cord lesions were significantly reduced. Her symptoms of upper limbs pain, numbness of chest, and abdomen had improved markedly and was discharged.

After discharge, oral prednisone tablets in sequential treatment had been given, and drug dosage had been reduced to 1 tablet/day gradually. Three months later, the patient developed upper limbs pain and armpit pain, and lightning like feeling on bilateral thighs when she dipped her head. Serum AQP-4 antibody showed strongly positive. Cervical MRI [Figure 1c] showed cervical and thoracic spinal cord lesions like last time. NMO recurrence was considered. Methylprednisolone impact therapy and sequential reduction of hormone therapy were given. And after treatment, review of MRI [Figure 1d] showed the lesions significantly reduced. The symptoms of the patient partly alleviated and she was discharged. Followed up to date, the patient had taken drugs all the time and showed no recurrence [Figure 1e].

NMO is a kind of autoimmune disease with single or recurrent course, which causes selective, invasive injury of optic nerve and/or spinal cord. It is characterized by...
inflammation and necrosis in pathology. It is more common in women and young adults.

Because of its diverse clinical manifestations, it is easy to misdiagnose. The definition of NMOSD was proposed by Wingerchuk et al. in 2007. According to the criteria, this case showed lesions with longitudinally extensive transverse myelitis (more than three vertebrae) mainly located in the cervical and thoracic spinal cord. The lesions involving most of the gray matter and white matter located in the central spinal cord. Originally, the patient was diagnosed as cervical spondylosis owing to the clinical manifestations and MRI findings. As the relevant examination including AQP-4 antibody had been gradually improved, the final diagnosis of NMOSD was achieved.

In 2004, Lennon found a specific NMO-IgG antibody in the serum of patients with NMO and used it as a marker of biological, immunological diagnosis for NMO. Its sensitivity and specificity were 73% and 91%, respectively.

In 2005, Lennon et al. confirmed the specific target antigen of NMO-IgG was AQP-4 by double indirect immunofluorescence. In 2006, Wingerchuk et al. brought positive serum AQP-4 antibody into the main support standard included in the NMO diagnostic criteria revised. The guide for diagnosis and therapy of NMO by European Union on neurology in 2010 not only defined the NMOSD, but also put forward positive serum or cerebrospinal fluid AQP-4 antibody as the main support standard in the path for NMOSD diagnosis. This NMOSD patient was accompanied by cervical spondylosis. As clinical manifestations and MRI findings of this patient are very similar to cervical spondylosis with spinal cord degeneration simply, it is easy to be misdiagnosed. Positive serum AQP-4 antibody is very helpful for diagnosis.

Although NMOSD has a severe disability rate, it often shows spontaneous remission and relapse. In acute exacerbation, hormone therapy can achieve good relieve rate. Because it is easy to relapse, immunosuppression drugs are recommended to prevent its recurrence. Symptoms of this case improved obviously after hormone therapy. And one recurrence had appeared in this case until now.

In conclusion, NMOSD is easily misdiagnosed as cervical spondylosis when the lesions are confined to the cervical and thoracic spinal cord. It will result in a severe outcome without timely diagnosis. Thus, early diagnosis is very important. In addition to typical clinical manifestations and imaging, detection of serum AQP-4 antibody is significant for a diagnosis.

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Conflicts of interest
There are no conflicts of interest.

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