Acute Bilateral Optic Neuritis in Active Ankylosing Spondylitis

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Ankylosing spondylitis (AS), which primarily affects the sacroiliac joints, spine, and enthuses, is a chronic inflammatory rheumatic disorder. Acute anterior uveitis is the most common ophthalmologic involvement, whereas optic neuritis (ON) rarely coexists with AS.[1]

ON is an immune-mediated inflammation of the optic nerve, which could be the initiated symptom of multiple sclerosis (MS) or neuromyelitis optica (NMO). Bilateral simultaneous ON with long enhanced optic nerve lesions in magnetic resonance imaging (MRI) was considered as features of NMO spectrum disorders (NMOSDs). However, comprehensive review of the current literature showed little evidence of AS as an accompanied autoimmune condition in NMO,[2] and the specific biomarker aquaporin-4 antibody (AQP4-Ab) was negative in our patient. In the current report, we present the first case of ON with active AS in a Chinese male patient. The association between the two diseases remains to be evaluated.

A male patient aged 31 years suffered sudden decreased vision in two eyes without ocular pain. The vision loss began with central scotoma and darkened in the whole visual field, equivalent in the two eyes, and quickly progressed to no-light-perception (NLP) in several hours.

The immediate fundus examination revealed slight swelling optic disc with normal retina. Symmetrical thickening of temporal peripapillary retinal nerve fiber layer was revealed by optical coherence tomography. Fundus fluorescence angiography showed mild fluorescence of the optic disc in a later phase. The initial diagnosis of bilateral ON was made. However, no efficient treatment was given by the local hospital.

Twenty days later, the patient came to us with bilateral pale optic discs. Visual acuity (VA) in the right eye was light-perception while in the left eye was still NLP. Bilateral mydriasis was found, and the relative afferent papillary defect was positive in the left pupil. Flash-visual evoked potential of the two eyes showed severely decreased amplitude of P100 while bilateral electroretinogram was normal. Brain, cervical thoracic and orbital MRI were performed and showed bilateral optic nerves enlargement, T2 hyperintensity, and gadolinium enhancement [Figure 1].

Blood tests showed greatly increased C-reaction protein (CRP) of 107 mg/L (normal range: 0–8 mg/L), erythrocyte sedimentation rate (ESR) of 88 mm/h (normal range: 0–15 mm/h), and strong positive HLA-B27 (98%, normal range: 0–7.14%). The examination of serum used the best available method (cell-based assay) revealed negative AQP4-Ab. The results of other serologic testing of antinuclear antibody spectrum, anti-neutrophil cytoplasmic antibody, rheumatoid factor, anticardiolipin antibody, angiotensin converting enzyme, syphilitic serologic test, and paraneoplastic tests were all negative. Lumbar puncture was performed and showed normal cerebral-spinal fluid (CSF) in the routine tests, including the cell count and protein concentration, as well as negative oligoclonal bands.

The patient's father had a history of AS for 20 years. The diagnosis of AS was confirmed for the patient himself 10 months ago according to the New York criteria.[1] He received nonsteroidal anti-inflammatory drugs

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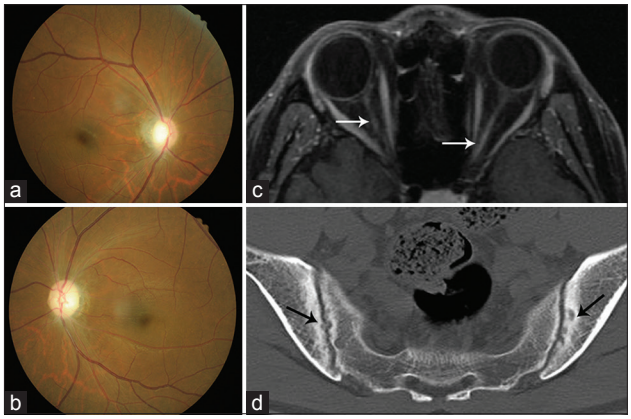

Figure 1: The image evidences of optic neuritis in our clinic (20 days after onset). The appearance of optic discs were pale with blurred border in both right (a) and left (b) eyes; (c) Orbital magnetic resonance imaging showed gadolinium enhancement in bilateral optic nerves (white arrow). (d) Computed tomography revealed bilateral sacroiliitis (black arrow).

and sulfasalazine irregularly, together with intraarticular injection of corticosteroid to control the symptoms. When the visual symptoms occurred, bilateral gonarthritis was found. The severe back pain lasted and the morning stiffness prolonged from several minutes to more than 0.5 h. Exudation of bilateral knee joints cavity and bilateral sacroiliitis of grade 2 were revealed by ultrasonography and computed tomography, respectively. The significantly elevated ESR and CRP, combined with a Bath Ankylosing Spondylitis Disease Activity Index of 5.5 indicated the co-existed active AS.

The patient was treated with intravenous methylprednisolone, which began with 1 g for 3 days, then followed by oral 1 mg/kg for 10 days and tapered. VA in the right eye improved to hand move when discharged and to 0.02 after our follow-up period of 2 years, but VA in the left eye was continuously NLP.

Eye inflammation in AS is largely restricted to the uvea. To date, the co-existed AS and ON were only reported in three cases, but no reaction of AS was observed during ON onset. ON could be the initiated symptoms of MS. The typical ON with the unilateral visual loss, eye pain in movement, and spontaneously recovery will develop to MS in 50% after 15 years according to the results of the ON treatment trial. Nevertheless, the atypical clinical appearance of bilateral eyes involved, optic disc edema, and severe visual loss without eye pain were considered as having lower risks for developing MS. Co-existence of MS and AS was reported in several cases,[3] but the mechanics were still uncertain. A peptide of myelin basic protein was reported to be a ligand of HLA-B27 and both AS and MS may share the similar pathologic pathway of activation of T lymphocytes with the environmental factors. Besides, a causal association between anti-tumor necrosis factor (TNF)-α blockers (infliximab, etanercept, and adalimumab, etc.), which target the overexpressed TNF-α in sacroiliac joints and widely employed against AS, and onset of MS or ON may exists.[4] Yet, our patient had no history of using anti-TNF-α medicine. Moreover, atypical ON was showed in this case, and CSF was negative for intrathecal production of oligoclonal bands, which may indicate non-MS mediated etiology.

Atypical ON may indicate a high prevalence of serum AQP4-Ab, and ON with seropositive AQP4-Ab was covered in the term of NMOSDs. The diagnostic criteria of NMOSDs including classical NMO and some limited forms, which may have the same pathogenesis mechanisms of astrocyte damage with complement and antibody mediated cytotoxicity. Serum AQP4-Ab, known as NMO-IgG, the presence of which was over 70% sensitive and 100% specific by cell-based assay for clinically defined NMO,[5] is critical in distinguishing NMO related ON from MS. Moreover, 10–25% of patients clinically diagnosed with NMO are seronegative for AQP4-IgG. Hence, extended follow-up in our patient was necessary.

In conclusion, this is the first case of severe bilateral ON with active AS. Further investigations should be made in the ON population of China and may provide more clinical evidences for this phenomenon.

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Conflicts of interest

There are no conflicts of interest.

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