รายงานผู้ป่วย: ภาวะเส้นประสาทตาอักเสบผิดแบบจากโรคนิวโรมัยอิลัยติสออฟติกา

A Case Report: Neuromyelitis optica-related atypical optic neuritis

สุนทรี ธิติวิเชียรเลิศ[1], วิมลวรรณ ตั้งปกาศิต[2]

Suntaree Thitiwichienlert[1], Wimolwan Tangpagasit[2]

[1, 2]ภาควิชาจักษุวิทยา คณะแพทยศาสตร์ มหาวิทยาลัยธรรมศาสตร์

[1, 2]Department of Ophthalmology, Faculty of Medicine, Thammasat University

บทคัดย่อ

นิวโรมัยอิลัยติสออฟติกา เป็นกลุ่มโรคออโตอิมมูนชนิดหนึ่งที่พบพยาธิสภาพของเยื่อหุ้มไมอีลินของเส้นประสาทตา ประสาทไขสันหลัง และสมองบางส่วน เช่น ไฮโปธามัส ถูกทำลาย ผู้ป่วยที่มีภาวะเส้นประสาทตาอักเสบจากโรคนิวโรมัยอิลัยติสออฟติกามักมีลักษณะทางคลินิกไม่จำเพาะ ซึ่งแตกต่างจากภาวะเส้นประสาทตาอักเสบที่พบร่วมกับโรคมัลติเพิล สเคลอโรซิส รายงานผู้ป่วยหญิงไทยอายุ 54 ปี มาด้วยอาการตามองเห็นลดลงทั้งสองข้างอย่างฉับพลัน และค่อยๆ แย่ลงโดยมีอาการปวดนำมาก่อน ตรวจตาพบการตอบสนองของรูม่านตาต่อแสงลดลง และตรวจขั้วประสาทตาพบมีขั้วประสาทตาปกติทั้งสองข้าง การตรวจร่างกายทางระบบประสาทไม่พบกล้ามเนื้ออ่อนแรงหรืออาการชา ผลตรวจเอกซเรย์คลื่นแม่เหล็กไฟฟ้าสมองและเบ้าตาพบความผิดปกติของเส้นประสาทตาทั้งสองข้างโดยที่ไม่พบความผิดปกติบริเวณสมองร่วมด้วย การตรวจเลือดพบแอนติบอดีต่ออะควาพอริน 4 จึงสนับสนุนว่า เป็นโรคนิวโรมัยอิลัยติสออฟติกา

คำสำคัญ: นิวโรมัยอิลัยติสออฟติกา, เส้นประสาทตาอักเสบ, มัลติเพิลสเคลอโรซีส, อะควาพอริน 4

Abstract

Neuromyelitis optica (NMO) is an autoimmune demyelinating disease affects the optic nerve and spinal cord and certain parts of the brain such as the hypothalamus. Patients with NMO-related optic neuritis often present with atypical features which differ from optic neuritis associated with multiple sclerosis (MS).We present a 54-year-old healthy female complaining of bilateral painful progressive visual loss. Eye examinations revealed afferent pupillary defect and normal optic disc appearances. Neurological examinations revealed no motor and sensory deficits. MRI brain and orbit demonstrated bilateral optic nerve enhancing lesions without any brain lesions. The diagnosis was confirmed by a serum test showing aquaporin-4 immunoglobulin G antibodies (AQP4-IgG) seropositivity.

Keywords: Neuromyelitis optica, Optic neuritis, Multiple sclerosis, Aquaporin-4

Introduction

Optic neuritis is mostly related to isolated or demyelinating disorders. Most cases occur in young age. Clinical features typically present as subacute unilateral visual loss that progressive over several days associated with periorbital pain that precede visual loss or occur simultaneously.[1] These features can help for the clinical diagnosis and do not require further investigation. Atypical features that need further investigations include bilateral visual loss, lack of pain, severe pain or severe visual loss, signs of ocular inflammation, or lack of spontaneous visual recovery within one month.[2] Atypical optic neuritis usually associated with infectious, autoimmune, or systemic inflammatory diseases which require treatment to preserve vision.

Neuromyelitis optica (NMO) or the new term; neuromyelitis optica spectrum disorder (NMOSD) is an autoimmune demyelinating CNS disorder which is characterized by optic neuritis and transverse myelitis and certain parts of the brain lesion such as the hypothalamus. Most patients have serum aquaporin-4 immunoglobulin G antibodies (AQP4-IgG) and these specific antibodies are required as one of diagnostic criteria. Diagnostic criteria for NMOSD with AQP4-IgG require at least one of six core clinical characteristics plus AQP4-IgG seropositivity.[3,4] Clinical features of NMO-related optic neuritis include: simultaneously bilateral, chiasmal involvement, altitudinal visual field defect, visual acuity 20/200 or worse.[5] The present case report involves NMOSD presenting as atypical optic neuritis.

Case Report

A 54-year-old healthy female presented with acute visual loss in the left eye preceded by headache and periorbital pain followed by a decreased in right eye vision 2 days later. She complained previously of bilateral lower limb weakness for over 3 months, although she can stand and walk by herself. She did not have previous episodes of visual loss, numbness, and bowel bladder dysfunction. There was no significant history of recent viral illness or recent vaccination. Initial best corrected visual acuities were light projection OD and light perception OS. The intraocular pressure and anterior segment were normal both eyes. The pupils decrease in constriction both eyes with afferent pupillary defect in the left eye. The ocular motility was full bilaterally and she still had pain on eye movement. The

fundus examination was normal; both optic discs did not have swelling or pallor (Figure 1). Neurological examinations revealed no decrease of sensation, motor weakness, and other cranial nerves involvement. We cannot perform the color vision and visual field due to the patient's severe visual impairment.

MRI of the brain and orbit with gadolinium contrast showed mild enhancement of bilateral optic nerves in T1-weighted images. No evidence of periventricular white matter lesion in FLAIR T2-weighted images (Figure 2). MRI of whole spine showed no hyperintense intramedullary lesion or cord enlargement (Figure 3).

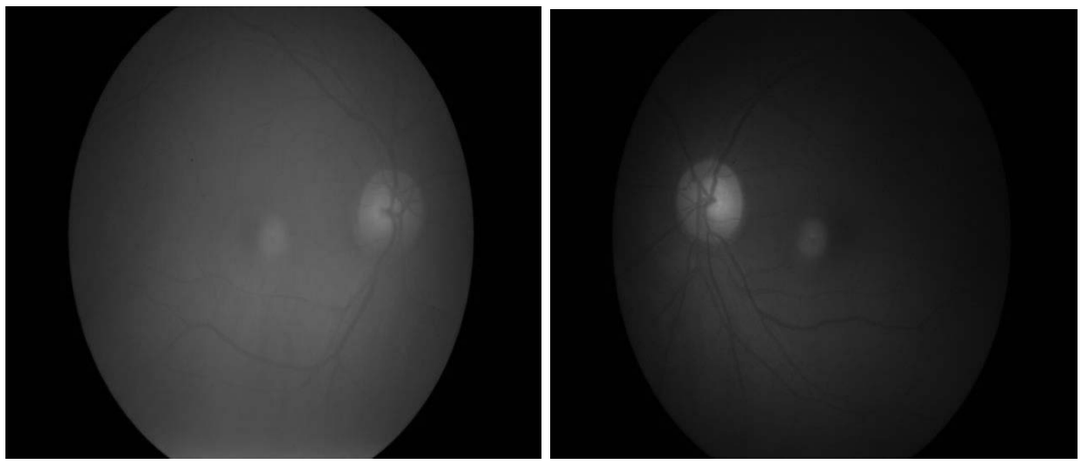

Figure 1 shows normal optic disc appearance.

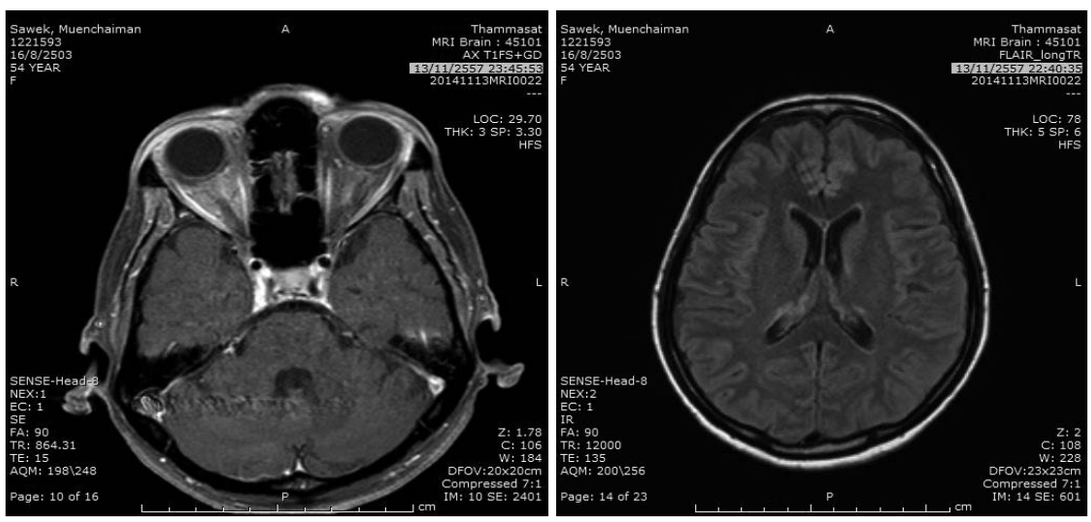

Figure 2 shows bilateral gadolinium-enhancing optic nerve lesions in fat-suppressed T1-weighted orbital MRI. No evidence of periventricular white matter lesion in FLAIR T2-weighted brain MRI.

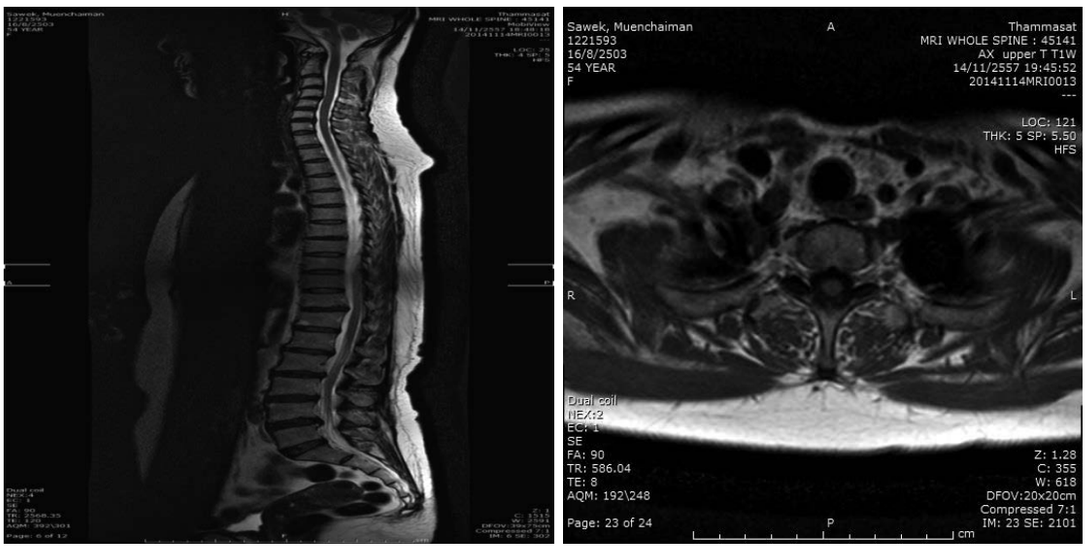

Figure 3 shows no hyperintense intramedullary lesion or cord enlargement in whole spine MRI.

Investigations of serum inflammatory markers include erythrocyte sedimentation rate, C-reactive protein, and serum autoimmune markers include rheumatoid factor, lupus anticoagulant, anti-double stranded DNA antibody, anti-neutrophil cytoplasmic antibody, and anti-nuclear antibody revealed negative. Routine laboratory tests for starting systemic corticosteroids were all normal. The patient was consult with neurologist and underwent lumbar puncture procedure. The cerebrospinal fluid (CSF) analysis revealed normal opening CSF pressure, protein level, sugar level, oligoclonal bands, and cytology.

The patient received high-dose intravenous methylprednisolone (IVMP) (1 gram/day) for five days followed by oral prednisolone (1 mg per kg body weight). Additional investigation for serum AQP4-IgG titer was performed; the blood samples were sent to the Prasart Neurological Institute which turned out to be positive. On follow-up at two weeks after admission, the visual acuities were improved to 5/200 OD and count finger 1 foot OS. After the diagnosis of NMO was confirmed by AQP4-IgG seropositivity, the patient was scheduled to continue oral prednisolone for six months then tapered over to azathioprine for long-term treatment.

Discussion

For patients experiencing typical clinical features of optic neuritis, the diagnosis often will be idiopathic or inflammatory demyelinating associated with multiple sclerosis. The

patient usually received high-dose IVMP (1 gram/day) for three days followed by oral prednisolone as the Optic Neuritis Treatment Trial (ONTT) regimen. The benefits of ONTT regimen were following; (1) fasten visual recovery even though no difference in final visual acuity, and (2) reduce risk of developing clinically definite multiple sclerosis (CDMS) about 50% in the first 2 years in patients with abnormal MRI brain 2 or more lesions.[6] This treatment regimen was well tolerated with few major side effects. The visual prognosis has a good visual recovery.[7]

In contrast to patients experiencing atypical clinical features of optic neuritis, the diagnosis may be infectious, autoimmune, or systemic inflammatory diseases include NMOSD. NMOSD must be differentiated from MS in patients with optic neuritis because no clinical characteristic is pathognomonic of NMOSD such as bilateral simultaneous optic neuritis may also occur in MS. There are some red flags which help to distinguish NMOSD from MS-related optic neuritis. NMOSD should be suspected in patients have progressive visual loss more than two weeks, lack of visual improvement within one month, and the episode of visual loss tend to recur with severe visual impairment (acuity 20/200 or worse) in at least one eye.[4]

Recently, The International Panel for NMO Diagnosis (IPND) established NMO diagnostic criteria for clinical decision-making.[4] These criteria were revised for both NMOSD with AQP4-IgG and NMOSD without AQP4-IgG or NMOSD with unknown AQP4-IgG status. Optic neuritis is the one of 6 core clinical characteristics. Testing for AQP4-IgG should be considered for patient suspect NMOSD-related optic neuritis. The serology has 73% sensitivity and 91% specificity.[8] The diagnosis still requires additional findings, particularly when AQP4-IgG is not detected or unknown status. Additional findings for acute optic neuritis in NMO requires brain MRI showing normal findings or only nonspecific white matter lesions, or orbital MRI showing T2-hyperintense lesion or T1-weighted gadolinium-enhancing lesion extending over ½ optic nerve length or involving chiasm.[4]

Acute treatment is high-dose corticosteroids; IVMP 1 g for 5 days followed by prednisolone (1 mg per kg body weight). Most patients need prednisolone at dose 0.5-1 mg/kg for up to 3 months after an attack, and then a slow tapering off over 6-12 months.[9] Waiting time for serum AQP4-IgG testing are about two weeks. Once the exclusion of alternative diagnoses particularly systemic infectious diseases are established, the patients

can be manage as idiopathic optic neuritis until the AQP4IgG titer is known. If the AQP4-IgG titers return as negative and no additional findings suggest NMOSD, prednisolone should be tapered off quickly. If the titers return as positive, prednisolone should be continued and immunosuppressant agents should be considered to prevent relapse. Some patients may need a low dose of prednisolone to maintain remission.[10]

Conclusion

Detecting atypical features have clinical importance. NMOSD must be considered in the differential diagnosis in patients presenting with atypical optic neuritis. In the present case report, the patient had atypical clinical features of optic neuritis. The radiological findings detected mild enhancement of bilateral optic nerves and the serological findings detected positive antibody titers that highly suggestive of acute optic neuritis in NMO. The NMO patient needed regular follow up examinations because the episodes of attack have tend to relapse even in case that was achieved with corticosteroids and immunosuppressive treatments.

References

1. Voss E, Raab P, Trebst C, Stangel M. Clinical approach to optic neuritis: pitfalls, red flags and differential diagnosis. Ther Adv Neurol Disord. 2011 Mar;4(2):123-34.
2. Lee AG, Lin DJ, Kaufman M, Golnik KC, Vaphiades MS, Eggenberger E. Atypical features prompting neuroimaging in acute optic neuropathy in adults. Can J Ophthalmol. 2000;35:325–30.
3. Wingerchuck DM, Lennon VA, Pittock SJ, Lucchinetti CF, Weinshenker BG. Revised diagnostic criteria for neuromyelitis optica. Neurology.2006;66:1485-9.
4. Wingerchuk DM, Banwell B, Bennett JL, Cabre P, Carroll W, Chitnis T, de Seze J, Fujihara K, Greenberg B, Jacob A, Jarius S, Lana-Peixoto M, Levy M, Simon JH, Tenembaum S, Traboulsee AL, Waters P, Wellik KE, Weinshenker BG; International Panel for NMO Diagnosis. International consensus diagnostic criteria for neuromyelitis optica spectrum disorders. Neurology. 2015 Jul 14;85(2):177-89.

5. Wingerchuk DM, Hogancamp WF, O'Brien PC, Weinshenker BG. The clinical course of neuromyelitis optica (Devic's syndrome). Neurology 1999;53:1107-1114.
6. Beck RW, Gal RL.Treatment of acute optic neuritis: a summary of findings from the optic neuritis treatment trial. Arch Ophthalmol. 2008 Jul;126(7):994-5.
7. Atkins EJ, Biousse V, Newman NJ. The natural history of optic neuritis. Rev Neurol Dis. 2006 Spring;3(2):45-56.
8. Jarius S, Wildemann B. Aquaporin-4 antibodies (NMO-IgG) as a serological marker of neuromyelitis optica: a critical review of the literature.Brain Pathol. 2013 Nov;23(6):661-83.
9. Jacob A, McKeon A, Nakashima I, Sato DK, Elsone L, Fujihara K, de Seze J.Current concept of neuromyelitis optica (NMO) and NMO spectrum disorders. J Neurol Neurosurg Psychiatry. 2013 Aug;84(8):922-30.
10. Malik A, Ahmed M, Golnik K. Treatment options for atypical optic neuritis. Indian J Ophthalmol.2014;62:982-4.