CASE REPORT

Recurrent Retrobulbar Optic Neuritis in Seronegative Rheumatoid Arthritis

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ABSTRACT

Rheumatoid arthritis (RA) is a multisystemic autoimmune disease which can be associated with visual threatening ocular manifestations. Common ocular associations with RA include necrotising scleritis and peripheral ulcerative keratitis (PUK). Optic nerve involvement otherwise is uncommon, especially as a presenting feature of RA. We report a rare case of recurrent bilateral retrobulbar optic neuritis (ON) with progressive visual deterioration as an early manifestation of seronegative RA. This case posed diagnostic and management challenges due to its unusual presentation and initially inconclusive investigations. The patient was diagnosed with seronegative RA three years after the first eye presentation. Her RA disease activity score (DAS-28) improved after treatment with a disease-modifying anti-rheumatic drugs (DMARDs), and her ON attacks have been controlled since then. However, her visual acuity, visual field and colour vision remained poor after multiple ON attacks. Multidisciplinary care is key to managing such a patient's condition and its potential disease complications.

Keywords: Optic Neuritis, Arthritis, Rheumatoid

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INTRODUCTION

Optic neuritis (ON) is an inflammatory optic neuropathy typically associated with multiple sclerosis (MS). Its aetiological causes can include demyelinating disease or autoimmune disease such as rheumatoid arthritis (RA) (1). RA is a multisystemic autoimmune disease which causes general damage to synovial-lined joints. It is associated with several inflammatory ocular conditions, including scleritis, episcleritis and peripheral ulcerative keratitis (PUK) (2). As reported by Chen et al., ON is uncommon in patients with RA, especially as a presentation of the disease (3). We report a rare case of recurrent retrobulbar ON with progressive visual deterioration as an early manifestation of seronegative RA.

CASE REPORT

A 40-year-old woman presented to the eye clinic in 2015 with gradually reducing vision in the left eye. She also experienced intermittent periorbital discomfort. She had no history suggesting infection, trauma or malignancy; she also reported no history of joint pain or swelling, malar rashes, or limb weakness. An examination revealed best corrected visual acuity (BCVA) of 6/6 with the right eye and 6/9 with the left eye. Her relative afferent pupillary defect (RAPD) test was negative, and optic nerve function tests, anterior segment and fundus examinations were unremarkable.

At a subsequent visit three months later, her bilateral vision had worsened, and she experienced associated symptoms of dyschromatopsia and painful eye movement. She had no joint or neurological complaints. A clinical examination revealed BCVA of 6/30 bilaterally with significantly reduced perception of light brightness and colour. Her RAPD was negative, and fundus examinations were unremarkable. Perimetry indicated a paracentral defect in the right eye and an altitudinal field defect in the left eye (Fig. 1). Infective and connective tissue screenings were negative. An MRI of the brain and orbit showed a normal-sized optic disc with no abnormal enhancement. There was also no evidence of MS, NMO or neurodegenerative

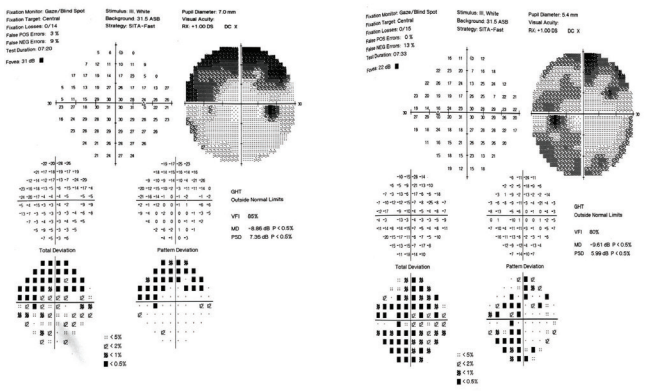

Figure 1: Humphrey Visual Field test showing right eye paracentral defect and left eye altitudinal field defect during the first ON episode

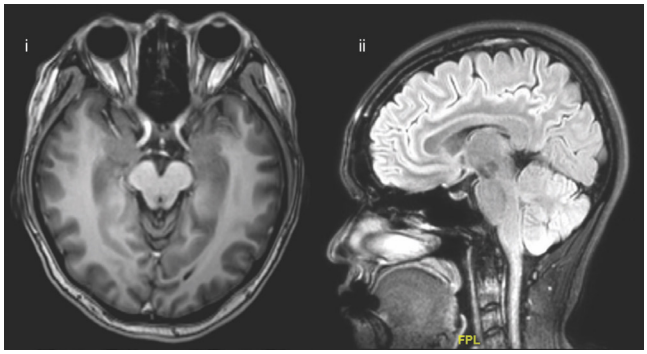

Figure 2: MRI of brain and orbit showing no abnormal signal intensity or focal enhancing lesion of the brain parenchyma; it also shows a normal-sized optic nerve with no bulging of the optic nerve head and no abnormal Gadolinium enhancement

changes (Fig. 2). She was diagnosed with bilateral retrobulbar ON and admitted for a three-day course of IV methylprednisolone (1g/day), followed by an eleven-day course of oral prednisolone at 1mg/kg/day. Her BCVA improved to 6/9 bilaterally, and the painful eye movement resolved after six weeks. Over the following four years, she was admitted twice for a recurrence of retrobulbar ON. Repeated investigations produced negative results, including a normal lumbar puncture, normal MRI, and negative tests for neuromyelitis optica IgG (NMO-IgG), rheumatoid factor (RF) and anti-cyclic citrullinated peptide (anti-CCP).

Three years later, during her third ON attack, she started complaining of intermittent pain in her finger joints associated with swelling and morning stiffness; these symptoms persisted for more than three months (Fig. 3). After multiple workups excluding viral arthritis and HLA-B27 arthritis, she was diagnosed with seronegative RA, scoring 6/10 on the 2010 RA Classification Criteria (4).

Throughout the course of the disease before the RA diagnosis and her disease-modifying antirheumatic

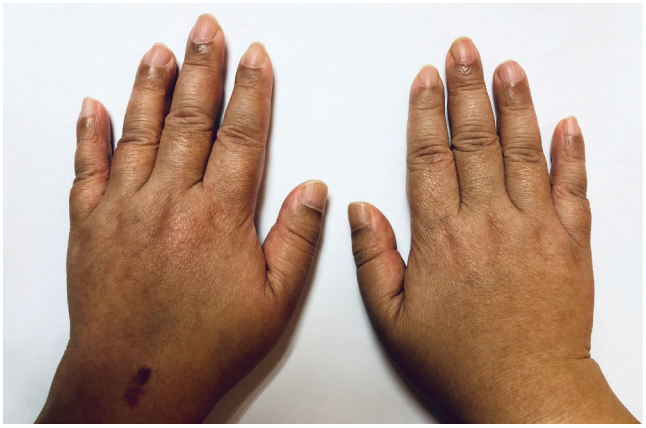

Figure 3: Symmetrical swelling and tenderness of all bilateral proximal interphalangeal and metacarpophalangeal joints of the hands

drugs (DMARDs) commencement, her vision worsened with BCVA fell to 6/60 on the right eye and 6/45 on the left. Her visual acuity, colour perception and visual field defects persisted without any improvement. In addition, her bilateral optic discs showed signs of temporal atrophy (Fig. 4). Her bad eyesight, poor colour perception and widespread joint pain caused difficulties at work, eventually forcing her to give up her dream job as a geography teacher.

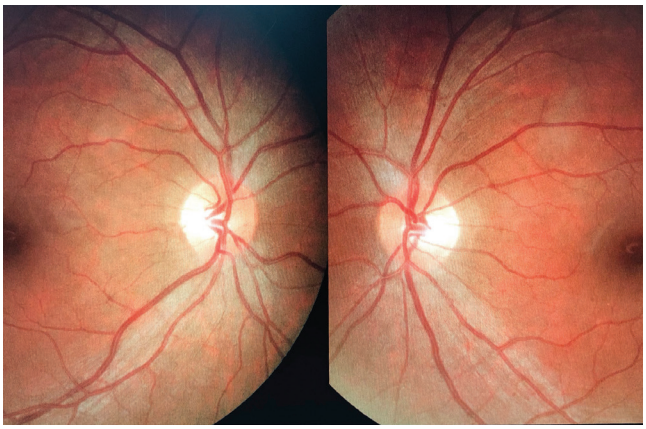

Figure 4: Fundus photo of both eyes demonstrating signs of temporal optic disc atrophy

Treatment commenced with 20mg of oral methotrexate weekly, 10mg of oral leflunomide daily and 400mg of oral hydroxychloroquine daily. After the initiation of treatment, her joint symptoms were controlled with improving DAS-28 score, and there were no new episodes of ON attack since.

DISCUSSION

RA is a chronic inflammatory disease, frequently presents with tender swollen joints and destruction of the synovial joints, which can lead to severe disability and premature mortality (4). While keratoconjunctivitis sicca (KCS) is reported to be the most common initial ocular manifestation of RA, other associated ocular

manifestations may include episcleritis, scleritis, keratitis and retinal vasculitis (2). Optic neuropathy was first described in RA patients in 1980 and was attributed to demyelination due to axonal necrosis. A post-mortem revealed features of multisystemic necrotising vasculitis, lymphocytic vasculitis and perivasculitis (3).

To the best of our knowledge, ON as a first presentation of RA has only been reported once. This occurred in a patient who was diagnosed with seropositive RA after 11 years of recurrent bilateral ON episodes. The attack started in the right eye; the left eye presented with similar symptoms four years later. After pulse therapy with methylprednisolone, vision in the right eye recovered. However, the left eye continued to lack light perception and presented with persistent visual field defects. Bilateral atrophy in the optic discs was also observed (3).

In our case, the initial presentation was unspecific, as there was no initial evidence to suggest ON or other ocular abnormalities. After three months, our patient presented with features that are atypical of ON, including bilateral involvement, progressive visual loss and poor recovery. In addition, repeated workups for demyelinating disease, autoimmune disease, infection, metabolic disease, and infiltrative disease returned inconclusive results. After three years, she started to develop pain and swelling in multiple joints and morning stiffness in bilateral finger joints and in the left elbow and ankle. She scored 6/10 on the 2010 RA Classification Criteria due to involvement of more than ten joints (5 points), and symptoms lasting more than six weeks (1 point). Diagnosis was also made based on clinical judgement in addition to meeting classification criteria. Although her acute phase response status and serological test were negative, the number of joints involved and long duration of symptoms met the most recent criteria to confirm a diagnosis of RA. This is parallel with the aim of the criteria, in preventing erosion and other complications by early diagnosis and treatment initiation (4).

Seronegative RA should not be underestimated, as patients may only been started on treatment when the disease has become severe. Moreover, non-specific presentation and inconclusive investigations can also lead to delayed diagnosis and initiation of treatment with DMARDs (5). In our case, DMARDs was initiated upon the diagnosis of seronegative RA, three years after the first ocular complaints. Inconclusive investigations and late joint manifestation posed a huge diagnostic challenge, as upon starting the treatment, the inflammatory disease process may have begun far earlier.

Three months after DMARDs initiation, our patient's RA disease activity score (DAS-28) reduced from 5.3 (high activity) to 3.9 (moderate activity). To date, she has not experienced any new ON episodes or presented with any other RA-related conditions, such as scleritis, episcleritis or retinal vasculitis. This could be due to treatment with systemic immunosuppressive agents, which can significantly reduce the progression of ocular disease, stabilize visual acuity, and prevent the development of extraocular disease. Regular follow-up is crucial to monitor the activity and progression of the disease, as it is estimated that around half of patients with seronegative RA become seropositive later in life (5).

CONCLUSION

Atypical ON is a rare presentation of seronegative RA that can pose diagnostic challenges to ophthalmologists and rheumatologists alike. However, early diagnosis and initiation of treatment with DMARDs are crucial, especially in managing the ocular and systemic progressions and recurrence of the disease.

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