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Case report

Papillitis with retinal venous congestion and intraocular inflammation

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ABSTRACT

Purpose: To describe a case of pronounced papillitis with diminished venous outflow and vitreous inflammation in a 50-year-old man who was later found to have clinical and serological manifestations of dermatomyositis.
Observations: A 50-year-old man presented with papillitis associated with venous congestion and intraocular inflammation. He was normotensive, not on medications, and without known heritable hypercoagulable or inflammatory disease. Review of systems revealed axial and proximal muscle pain involving the lower back, hip, and thigh, and he developed a transient rash of the scalp. His evaluation including infectious, hypercoagulable, and inflammatory etiologies was negative except for a significantly elevated Mi-2 antibody titer. Treatment with intravenous and oral steroids improved the papillitis, visual acuity and visual field deficit.
Conclusions: Significant papillitis and retinal venous stasis with intraocular inflammation may be associated with dermatomyositis.
Importance: Rapidly progressive optic disc edema with associated inflammation and venous stasis requires a broad work up for infectious, hypercoagulable, and autoimmune etiologies for targeted therapy and visual preservation. To the best of our knowledge, this may be the first reported clinical presentation of dermatomyositis manifesting initially with papillitis and retinal venous congestion, based upon elevated Mi-2 antibodies and additional clinical features.

1. Introduction

The underlying pathophysiology of unilateral optic disc edema with retinal venous stasis varies widely, and the presence or absence of intraocular inflammation can inform a targeted diagnostic approach. Optic disc edema with retinal venous stasis has been previously reported and is postulated to be a primary inflammatory optic neuropathy with secondary disruption of retinal venous outflow.[1] A primary vascular occlusive process can similarly present with optic disc edema and intraocular inflammation.[2,3] The driving pathophysiology is key to directing the initial work up. Evaluation of a primary inflammatory optic neuropathy should focus on pertinent infectious, autoimmune, and ischemic etiologies targeting the optic nerve. On the other hand, a primary vascular occlusive process should focus on underlying conditions with a propensity to affect retinal vasculature or increase hypercoagulability.[3–5]

Dermatomyositis is not commonly considered in cases of intraocular inflammation, although there have been reports of visually significant optic neuropathy and venous stasis including central retinal vein occlusion (CRVO) in the setting of dermatomyositis.[6–8] The retinal vasculopathy is hypothesized to have a primary inflammatory etiology with associated endothelial damage and platelet thrombi.[6–8] Herein we describe a case of profound papillitis with diminished retinal venous outflow and intraocular inflammation that resolved with steroid therapy, and was subsequently found to have significantly elevated myositis specific antibody titers with other clinical features suggestive of dermatomyositis. To the best of our knowledge, this may be the first reported clinical presentation of dermatomyositis manifesting initially with papillitis and retinal venous congestion.

2. Case report

A 50-year-old male native of Israel without recent international travel history presented to the Wills Eye emergency room with painless decreased vision in his right eye upon awakening the same day. He reported mild pansinusitis and a remote history of non-ocular shingles. He denied any systemic or topical medications as well as any smoking history and excess alcohol consumption. Family history included a

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"blocked blood vessel of the retina" in his father. Review of systems was positive only for tinnitus, low back pain, and bilateral hip and thigh pain. Vital signs were normal. Pupils were equal, round, and reactive to light without an afferent pupillary defect. Visual acuity was 20/20 in both eyes (OU), although subjectively worse in the right eye (OD). He identified 14/14 Ishihara pseudo-isochromatic color plates with each eye. His ophthalmic examination was normal except for the fundus of the right eye which revealed moderate optic disc edema with one inferotemporal flame hemorrhage with associated venous tortuosity. No vitreous cells were observed in the emergency room. Angiotensin converting enzyme (ACE), anti-neutrophilic cytoplasmic autoantibody (ANCA), anti-nuclear antibody (ANA), neuromyelitis optica antibody (NMO), myelin oligodendrocyte glycoprotein antibody (MOG), complete blood count, Lyme, syphilis, and QuantiFERON gold were all normal except for an ACE level of 67 units/L (upper limit of normal 52). Contrast-enhanced magnetic resonance imaging of the brain and orbits was normal.

Neuro-ophthalmology evaluation the next day was notable for decreased visual acuity to 20/30 with anterior chamber and posterior vitreous cells, and confirmed optic disc edema on MultiColor fundus imaging and spectral domain optical coherence tomography (OCT) (Fig. 1). Humphrey visual field 24–2 testing revealed a superior arcuate defect in the right eye with a normal field in the left eye (Fig. 1). A computed tomography (CT) scan of the chest was normal without evidence of granulomatous disease. The patient was treated with 80 mg of prednisone daily.

After 10 days of prednisone therapy, he was evaluated in uveitis consultation and vision OD had deteriorated to 20/50 with persistent anterior chamber and vitreous inflammation and a new right afferent pupillary defect. Dilated fundoscopic exam showed mild dilation and tortuosity of retinal veins without macular edema, and distal vascular staining on fluorescein angiography (FA) (Fig. 2). The patient was admitted to the hospital for intravenous methylprednisolone 250 mg every 6 hours for 12 doses and initiated on topical difluprednate 4 times daily. A hypercoagulable work-up was normal including anticardiolipin, homocysteine, beta-2 glycoprotein antibody, lupus anticoagulation screen, protein C and S, antithrombin III, factor II prothrombin, and factor V Leiden.

A week following pulse dose steroids, the patient was transitioned to oral prednisone 80 mg daily and vision improved to 20/30. Additionally, he developed a diffuse erythematous rash of his scalp, which gradually resolved without specific treatment over the next few weeks. Visual acuity, disc edema, venous tortuosity, and intraocular inflammation resolved with slow tapering of oral steroids over the course of 3 months, and visual field deficits improved but did not fully resolve (Figs. 3 and 4). The patient remained asymptomatic off steroids at final follow up 5 months after initial presentation. The retinal nerve fiber layer and ganglion cell layer decreased significantly during his 5-month course (Fig. 5).

Because of the negative infectious, inflammatory, and hypercoagulable work up initially, the patient was referred to rheumatology. Systemic review of systems was notable for several months of tinnitus, mild pansinusitis noted on a CT scan from a year prior, lower leg pain worsened with exertion, low back and bilateral hip and thigh pain that improved with activity, and at least 2 distinct episodes of a transient scalp rash. He denied overt swelling of the muscles, other rashes, and

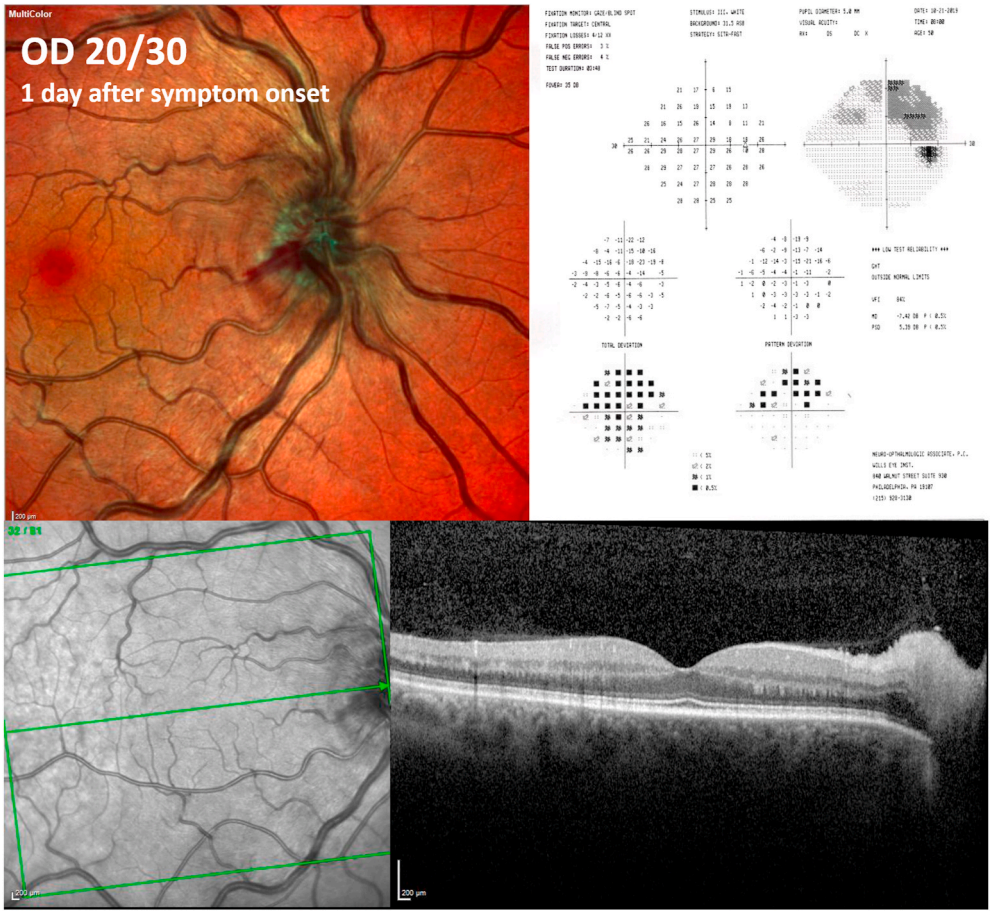

Fig. 1. Multicolor fundus imaging and spectral domain optical coherence tomography with corresponding 24–2 Humphrey visual field of the right eye. Visual acuity at initial evaluation in the neuro-ophthalmology clinic a day after symptom onset was 20/30 with significant optic disc edema, a peripapillary flame hemorrhage, vessel tortuosity, and trace vitreous cells. A Humphrey visual field showed a superior arcuate defect of the right eye.

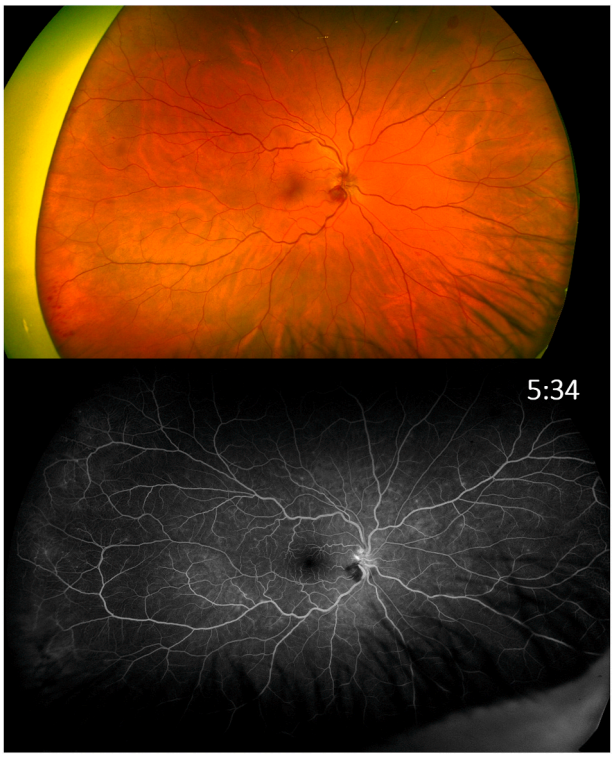

Fig. 2. Widefield color fundus photo and fluorescein angiography of the right eye. Widefield color fundus photo of the right eye 10 days after symptom onset revealed persistent optic disc edema and disc hemorrhage and mildly increased vessel tortuosity. A fluorescein angiography revealed late staining of the optic disc and distal retinal venules at 5 minutes 23 seconds (below). (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

oral or genital ulcers. Rheumatologic workup, including anti-Ro/SSA and anti-La/SSB, complement 3 and 4, serum protein electrophoresis (SPEP), rheumatoid factor (RF), erythrocyte sedimentation rate (ESR), *C*-reactive protein (CRP), aldolase, a hepatitis panel, and a myositis panel, was normal except for a significantly elevated Mi-2 antibody titer (98, reference <11). He underwent magnetic resonance imaging (MRI) of the lumbar spine to assess degenerative disc disease and inflammatory changes, an ankle brachial index (ABI) to rule out large vessel occlusive disease, and electromyography (EMG) to assess for small vessel vasculitis, which were all negative. Methotrexate 12.5 mg weekly was recommended, but the patient declined due to concerns regarding immunosuppression and systemic side effects. He was then lost to follow up.

3. Discussion

We present a case of unilateral papillophlebitis with features of dermatomyositis. The degree of papillitis initially progressed and correlated with a deterioration in visual acuity from 20/20 to 20/50 and visual field constriction. Although pupillary light responses were normal on presentation, an APD later developed as disc edema worsened, and resolved as the papillitis improved with corticosteroid treatment. Visual acuity improved to 20/20 and visual field deficits improved but did not entirely resolve.

The initial work-up for unilateral disc edema differs depending on the presence of absence of associated uveitis (Table 1). This case lacked traditional risk factors for arteritic or non-arteritic anterior ischemic optic neuropathy and featured intraocular inflammation with venous stasis, so initial diagnostic workup centered upon infectious, hypercoagulable, and inflammatory etiologies including sarcoidosis, Behçet disease, lupus, mixed connective tissue disease, ANCA vasculitis, and rheumatoid arthritis. The work up was initially negative, but further rheumatologic evaluation 5 months later revealed elevated Mi-2 antibodies and found other features consistent with dermatomyositis, including proximal muscle pain and a scalp rash that had occurred a few weeks after initial presentation.

The Mi-2 antibody targets a part of the nucleosome remodeling-deacetylase (NuRD) complex involved in transcription regulation and is strongly associated with dermatomyositis with a frequency of up to 31%, and has a sensitivity of 4–18% and specificity of 98–100% for inflammatory myopathy.[9] Dermatomyositis arises from microangiopathy affecting skin and muscle with complement mediated destruction of endomysial capillaries and subsequent tissue ischemia.[10] Proximal muscles including axial, shoulder, upper arms, hip, and thigh muscles tend to be affected.[11] Dermatologic findings, including the heliotrope violaceous rash of the upper eyelids, Gottron papules of the dorsal metacarpophalangeal joints, and a diffuse poikilodermic pruritic scaly rash of the scalp are characteristic.[11] The age of onset is typically between ages 40–60 and females tend to be affected more than males at a ratio of 2 to 1. The association between malignancy and dermatomyositis has been extensively reported.[11–13] Treatment for dermatomyositis includes immunosuppression, usually beginning with prednisone at a daily dose of 1–1.5 mg/kg, followed by steroid-sparing therapies such as methotrexate or azathioprine, and intravenous immunoglobulin for refractory or severe cases.[13]

Ocular findings associated with dermatomyositis have been previously reported.[6–8,14–18] Asymptomatic retinopathy, including intraretinal hemorrhages and cotton wool spots, is the most commonly reported ophthalmic finding in dermatomyositis.[14] Previous reports have suggested that the incidence of retinopathy may be underdiagnosed in many cases of dermatomyositis, and that dilated fundoscopic exams should be performed routinely.[14,15] Another study proposed that FA may have more sensitivity than dilated fundoscopic exam in diagnosing retinal vasculitis in dermatomyositis.[16] Case reports describing visually significant optic neuropathy, retinal vasculitis, vein occlusion, infarction of the retinal nerve fiber layer, and macular edema have proposed a primary inflammatory etiology with associated retinal vascular endothelial damage and platelet thrombi.[6–8,17] Optic neuropathy usually presents with retinopathy, although it has been reported as an isolated entity.[6,18] Treatment options include systemic corticosteroids and other immunosuppressive agents, and usually results in successful resolution of optic disc edema and intraocular inflammation, rarely requiring intraocular therapy.[6–8,17] One report of a CRVO and associated intraocular inflammation in the setting of dermatomyositis initially improved with corticosteroids, with subsequent macular edema and elevated intraocular pressure that resolved with topical intraocular pressure-lowering therapy and intravitreal bevacizumab.[8]

4. Conclusion

We present a case of papillitis and retinal venous congestion in a middle-aged adult male with clinical and serological features highly suggestive of dermatomyositis. Treatment with high dose intravenous steroids and oral steroids resulted in resolution of optic disc edema and improvement in visual acuity and visual field defects. The differential diagnosis and evaluation of patients with unilateral disc edema and venous congestion should be stratified according to the presence or absence of anterior chamber and/or vitreous cells. Papillitis with reduced venous outflow and inflammatory cells may be the first manifestation of dermatomyositis, and ophthalmologists should consider serum testing of Mi-2 antibody levels and rheumatology referral when clinically indicated.

5. Patient consent

The patient consented to publication of the case orally. This report

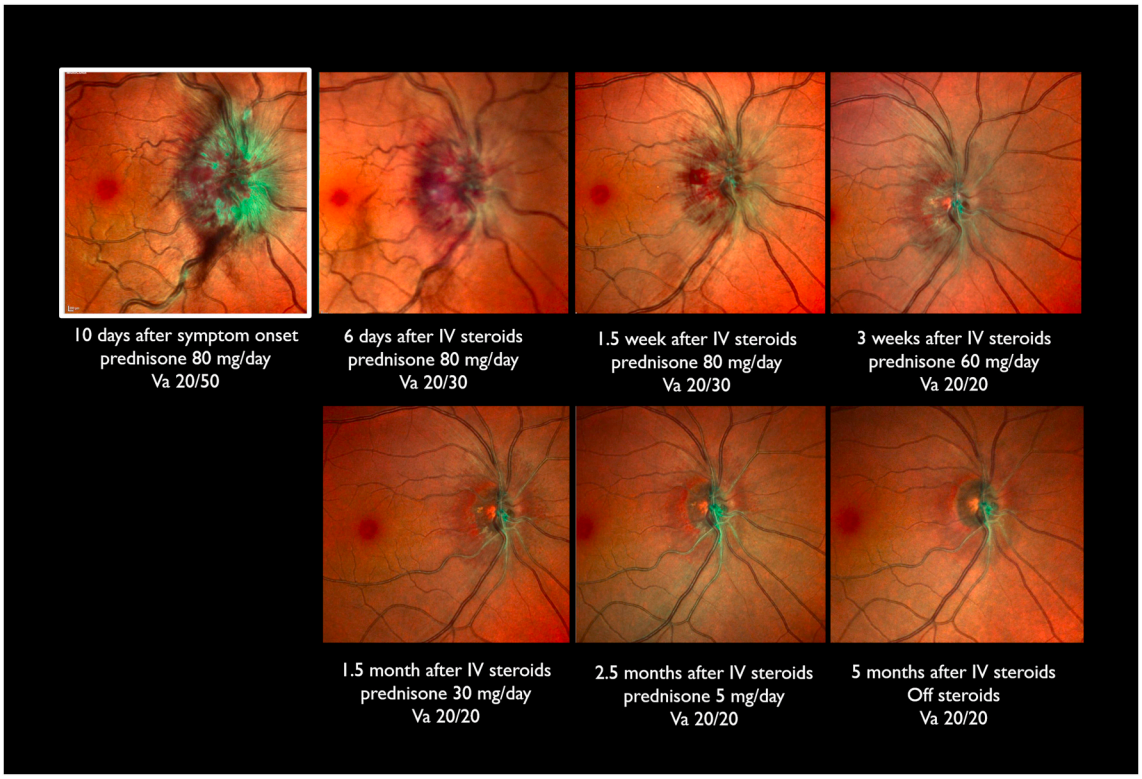

Fig. 3. Multicolor fundus imaging and spectral domain optical coherence tomography of the right optic disc over 5 months. Serial Multicolor fundus imaging and optical coherence tomography of the right optic disc shows profound optic disc edema prior to initiation of pulse dose intravenous steroids, and subsequent improvement and gradual resolution of optic disc edema after a course of pulse dose intravenous steroids followed by a slow oral steroid taper.

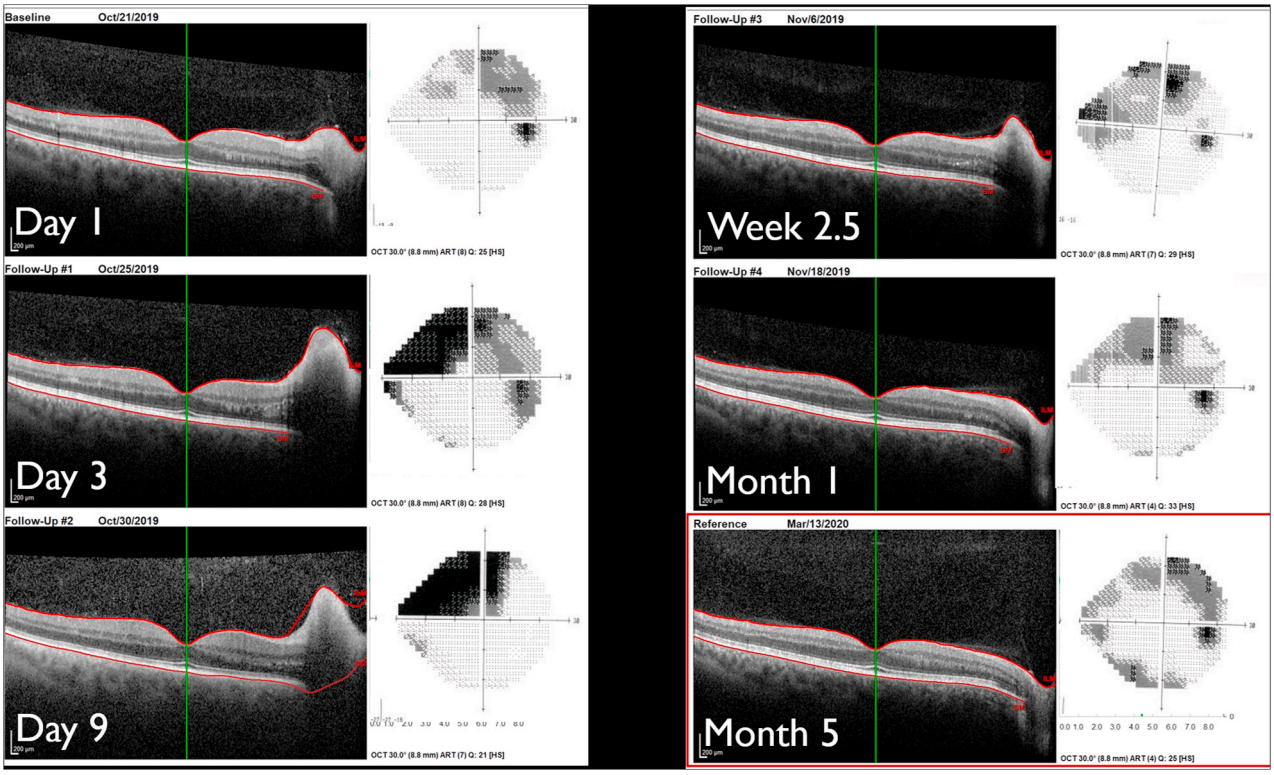

Fig. 4. Optical coherence tomography and corresponding 24–2 Humphrey visual field of the right eye over 5 months. Serial optical coherence tomography and corresponding visual field testing for the right eye shows initial worsening of disc edema and superior hemifield depressions prior to initiation of pulse dose intravenous steroids at Day 9, with subsequent improvement in optic disc edema and visual field defects, but persistent superior defects despite resolution of optic disc edema.

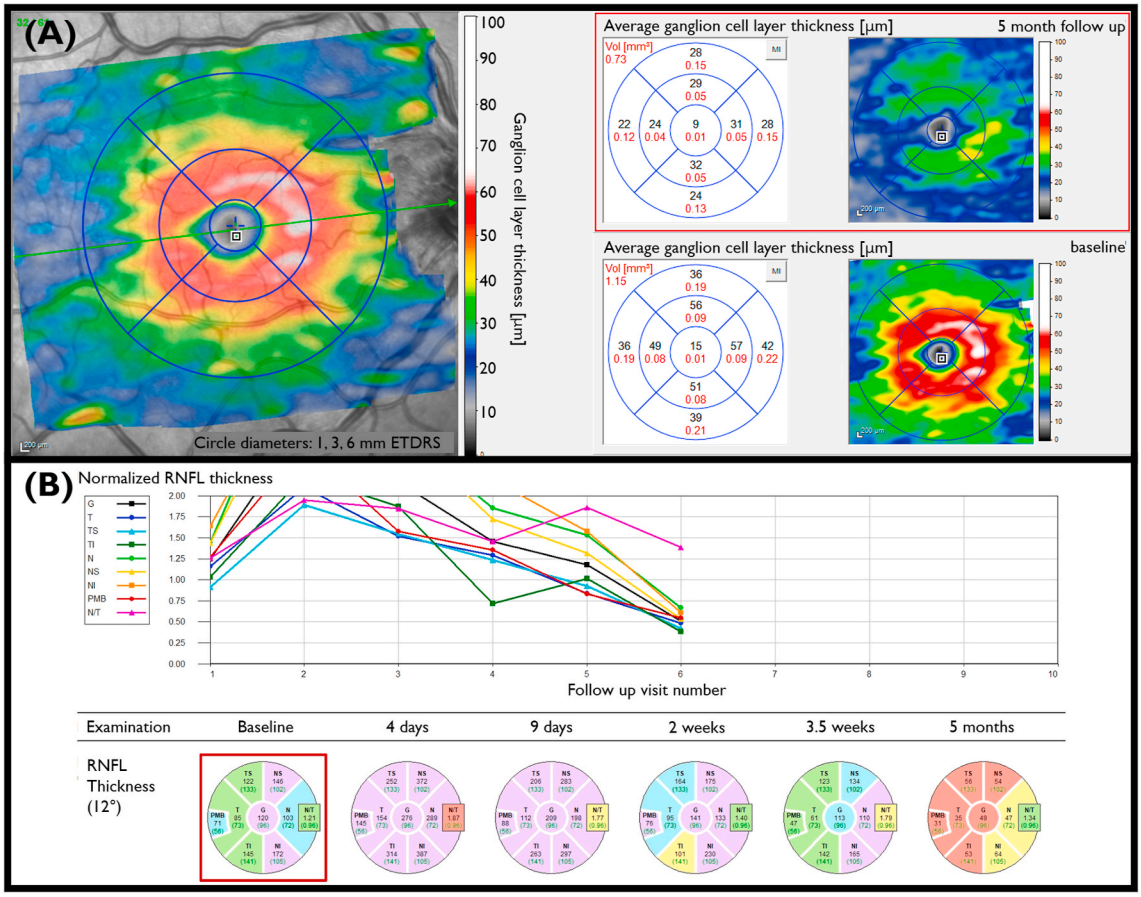

Fig. 5. Ganglion cell and retinal nerve fiber layer thickness analysis of the right eye. Average ganglion cell layer thickness (A) and retinal nerve fiber layer thickness (B) decreased at final follow up 5 months after initial presentation. In Panel A, the baseline ganglion cell layer thickness is depicted in the left panel and bottom right panel. The top right panel represents global thinning of the ganglion cell layer 5 months later. The line graph in Panel B depicts an initial increase in the normalized RNFL thickness from baseline to visit 1 followed by a gradual decrease at subsequent follow up intervals until month 5, which reflected the clinical course of papillitis. (G = global, T = temporal, TS = temporal superior, TI = temporal inferior, N = nasal, NS = nasal superior, NI = nasal inferior, PMB = papillomacular bundle, N/T = nasal/temporal).

Table 1
Comparison of differential diagnoses and risk factors for unilateral disc edema presenting alone and with intraocular inflammation.

Unilateral disc edema	Unilateral disc edema with intraocular inflammation
	Neuroretinitis
Arteritic anterior ischemic optic neuropathy	Sarcoidosis
Non-arteritic anterior ischemic optic neuropathy	Behçet disease
Hypertension	Systemic lupus erythematosus
Hyperlipidemia	Mixed connective tissue disease
Diabetes	ANCA-associated vasculitis
Small cup to disc ratio	Rheumatoid arthritis

does not contain any personal information that could lead to the identification of the patient.

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Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Declaration of competing interest

The following authors have no relevant current financial disclosures: CMW, JPD, RCS. RCS was previously a consultant for Heidelberg Engineering.

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