Inflammatory branch retinal artery and vein occlusion with panuveitis secondary to dengue fever

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Key words: Combined BRAO/BRVO, dengue fever, oral steroids, panuveitis

Sight threatening ocular manifestations have been described in dengue fever.[1] These manifestations can occur many months after the fever. We present to you a unique case of post dengue fever unilateral combined vascular occlusion with panuveitis with partial visual impairment.

A 57-year Indian male presented with sudden onset painless, decreased vision in the right eye (RE) from 1 week. He was diagnosed with dengue fever 5 months ago based on NS1 antigen test and had recovered well. Systemically he had diabetes, hypertension, and ischemic heart disease. Corrected distance visual acuity (CDVA) in the RE was 20/250 and the left eye (LE) was 20/20 at presentation. Anterior segment examination of the RE showed medium and fine keratic precipitates distributed centrally and inferiorly and anterior chamber had cells 1+. Intraocular pressure was normal in both eyes. Fundus examination of the RE showed vitreous haze ++and vitreous cells 1+, retinal hemorrhages, retinal opacification of the inferior macula, and sheathing of inferotemporal branch of the retinal artery [Fig. 1] with normal retinal periphery. LE examination was within normal limits.

Optical coherence tomography (OCT) of the RE showed posterior vitreous cells, cystoid macular edema (CME), and subretinal fluid (SRF) at the fovea with hyper-reflective intra-retinal dots inferior to the fovea and hyper reflectivity of inner retinal layers [Fig.2a]. Fundus fluorescein angiography showed arm to retinal circulation time of 19 s with RE delayed filling of inferotemporal branch of retinal artery indicated by blocked fluorescence-associated hypofluoroscence in the inferotemporal area. Late phases

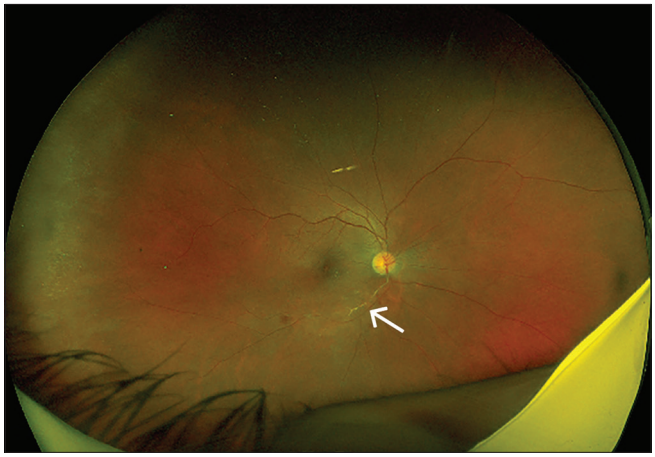

Figure 1: Wide field color fundus photo of the right eye showing retinal hemorrhages, retinal opacification inferior macula and sheathing of inferotemporal branch of retinal artery. (White arrow)

Access this article online

Quick Response Code:

Website: www.ijo.in

DOI: 10.4103/ijo.IJO_1368_20

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Received: 07-May-2020 Revision: 30-May-2020
Accepted: 12-Jun-2020 Published: 20-Aug-2020

Cite this article as: Sanjay S, Anilkumar A, Mahendradas P, Kawali A, Priya BV, Shetty BK. Inflammatory branch retinal artery and vein occlusion with panuveitis secondary to dengue fever. Indian J Ophthalmol 2020;68:1958-60.

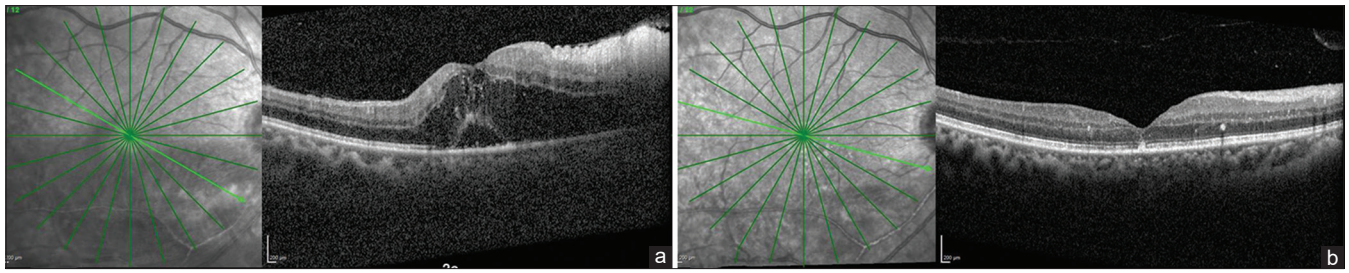

Figure 2: (a) Pre treatment optical coherence tomography of the RE showing posterior vitreous cells, cystoid macular edema and subretinal fluid at the fovea with hyper reflective intraretinal dots inferior to the fovea and hyper reflectivity of inner retinal layers. (b): Post treatment OCT of the RE showing very fewer vitreous cells, fewer hyper reflective intraretinal dots, resolved cystoid macular edema with thinning of inner retinal layers with focal area of hyper reflectivity in the RPE underneath the fovea. (Foveolitis)

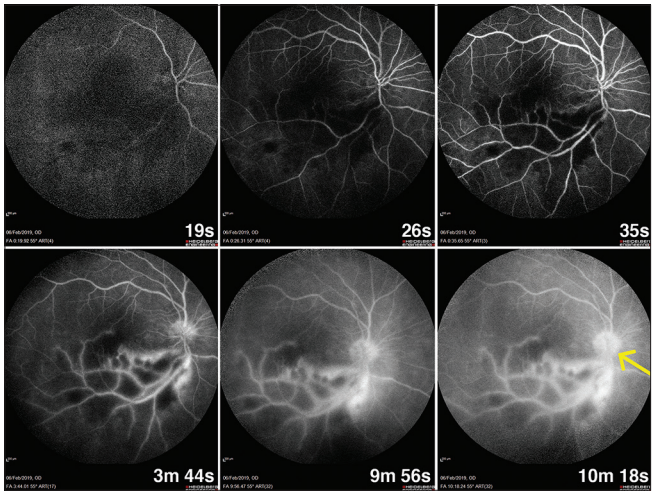

Figure 3: Serial photographs of fundus fluorescein angiography of the RE shows delayed filling of inferotemporal branch of retinal artery indicated by blocked fluorescence-associated hypofluoroscence in the inferotemporal area. Late phases showed disc leak with staining of vessels and leak in the inferotemporal quadrant with distortion of foveal avascular zone

showed disc leak with staining of vessels and leak in the inferotemporal quadrant [Fig. 3] and a normal angiogram in the left eye. Presumptive diagnosis of inflammatory combined branch retinal artery and vein occlusion with panuveitis was made.

Systemic investigations random blood sugar, serum homocysteine, lipid profile, urea, and creatinine were normal, with elevated inflammatory markers (ESR-38mm/h and CRP-2.8) Chikungunya IgM/IgG were negative. HIV, HbsAg, AntiHCV, and TPHA were non-reactive. Mantoux was negative with chest X-ray being normal. Dengue IgM/NS 1 were negative but dengue IgG (7.26) was positive. He was started on oral deflazacort 24mg/day as he was diabetic and it was tapered over 1 month (decreasing by 6mg every week) with topical steroid (3 hourly) with cycloplegic. The topical steroids were tapered over a period of 1 month.

On follow-up visit a month later, the RE CDVA was 20/60 with resolution of anterior chamber inflammation, reduction in vitreous haze and few anterior vitreous cells. Fundus examination showed very few hemorrhages and resolution of other retinal signs. OCT of the RE showed few vitreous cells, fewer hyper reflective intraretinal dots, resolved CME with thinning of inner retinal layers [Fig. 2b].

Discussion

Dengue fever (DF) is an infectious viral disease transmitted to humans through vector the *Aedes aegypti* female mosquito. Its systemic manifestations range from mild dengue fever to dengue hemorrhagic fever and sometimes even the fatal form of dengue shock syndrome. Ophthalmic manifestations include vitritis, vasculitis, retinopathy, retinal pigment epithelial (RPE) disturbances. Other ocular findings include subconjunctival hemorrhage, macular edema, vascular occlusions, foveolitis, and optic neuropathy.[1] Gupta *et al*. reported a case series of 6 patients who presented with uveitis, not attributable to any other cause, 35 months after DF.[2] Vascular occlusions have been reported albeit less commonly.[3-5] Branched retinal vein occlusion has been described in dengue fever.[3] Velaitham and Vijayasingham[4] had described a case of vein occlusion 1 week after the onset of DF. Their patient had no other systemic vascular risk factors and had subsequently developed proliferative retinopathy and was treated with laser photocoagulation. Preechawat *et al*.[5] described a case of non-ischemic retinal vein occlusion, which was initially diagnosed as inflammatory papillitis and recovered complete vision although he had persistent field defects with a slightly pale optic disc.[5] Retinal vascular occlusions could be due to the release of cytokines with vasoactive and procoagulant properties in response to immunological activation.[6] Mechanisms for thrombosis include the downregulation of cytoprotective protein C pathway in human endothelial vascular cells in dengue infection. Profound endothelial damage caused by anti-NS1 antibody cross-reaction with vascular endothelium result in the reduction of thrombomodulin on endothelial surface as proposed by Cabello *et al*.[7] This leads to decreased activated protein C and this downregulation increases the risk of thrombosis.[7] Primary plasminogen activator inhibitor type 1 prevents fibrinolysis leading to thrombotic state. Their levels are increased in DF.[8]

Blood aqueous barrier breakdown due to the inflammatory mediators could cause anterior uveitis.[9,10]

Our patient presented 5 months after being diagnosed with DF. Panuveitis and combined branch retinal artery and vein occlusion could not be attributable to any other cause even though he had systemic vascular risk factors that were well-controlled and his other eye being completely normal. The presence of vitreous cells and the intraretinal hyper reflective dots are pointers toward inflammatory nature of the disease. The inflammation subsided with improvement in vision after a course of oral steroids. Inflammatory combined vascular occlusion in the convalescent phase of DF is vision-threatening and may lead to permanent vision impairment.

Conclusion

We are reporting a unilateral combined branch artery and vein occlusion as a long term complication of DF. DF as a cause for vascular occlusions, albeit rare should be considered as one of the differential diagnosis. Use of oral steroids under adequate precautions may be necessary even when the patient has diabetes and hypertension.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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