CASE REPORT

A Patient Presenting with Bilateral Central Scotomas after Dengue Fever

Stephanie M Young, Patrick Santiago, Caroline KL Chee

ABSTRACT

We present a 33-year-old Eurasian female who was referred to the ophthalmology clinic for symptoms of gray patches over bilateral visual fields approximately 1 week after her onset of dengue fever (DF). Humphrey perimetry and Amsler grid testing revealed focal central scotomas in both eyes that corresponded to dark lesions on infrared fundus photographs. The use of infrared fundus photography to document the lesions of dengue maculopathy has been less frequently reported in contrast to other investigations, such as optical coherence tomography (OCT), fundal fluorescein angiography (FFA) and indocyanine green angiography (ICG). Our case represents part of a wide spectrum of ocular manifestations of dengue associated maculopathy and retinopathy, which should be on the minds of referring physicians and ophthalmologists in patients with visual symptoms after the onset of dengue fever.

Keywords: Dengue maculopathy, Central scotomas, Infrared fundus photography, Dengue fever.

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INTRODUCTION

Dengue fever (DF) is caused by one of four different but related viruses. It is spread by the bite of mosquitoes, most commonly the mosquito Aedes aegypti, and is endemic in the tropics and subtropical areas of the world.\(^1\) It is a multisystem disease that causes symptoms, such as fever, rash, muscle and joint ache and headache.\(^2\) Dengue hemorrhagic fever (DHF) is DF associated with thrombocytopenia (<100 \times 10^9 cells/L) and hemoconcentration (hematocrit >20% above baseline).\(^3\) Ophthalmic complications from DF and DHF have been reported, including macular edema, macular hemorrhage, cotton wool spots, retinal vasculitis and optic disk edema.\(^4-8\) Our patient presents with complaints of bilateral scotomas approximately 1 week after her onset of dengue fever, as confirmed on Humphrey perimetry and Amsler grid testing. Infrared fundus photography revealed bilateral dark lesions over the macula that closely corresponded with the shape, location and size of her scotomas. While the use of other investigations, such as optical coherence tomography (OCT) and fundal fluorescein angiography (FFA) have been used to investigate dengue maculopathy in other studies, our case demonstrates the usefulness of using infrared fundus photography to document and monitor the macular lesions.

CASE REPORT

A 33-year-old Eurasian female developed fever 2 days after returning from Thailand. Her fever was associated with myalgia, malaise, diarrhea, and a generalized rash that started over the legs and later spread to the arms, torso and back. Her dengue immunoglobulin M (IgM) was positive while immunoglobulin G (IgG) was negative. She also revealed that a person staying next to her living quarters in Thailand had been admitted for DHF at a local hospital. She was admitted to the medical ward of our tertiary hospital due a decreasing platelet trend (from 175 \times 10^9 cells/L to 44 \times 10^9 cells/L) over 5 days.

The patient started having visual symptoms 1 day after admission. She initially thought it was a worsening of her preexisting floaters. However, she noticed her vision was being obscured by dark gray patches over bilateral eyes, and persisted throughout the day, unlike the floaters she previously had.

Her visual symptoms persisted after discharge and she was referred to the ophthalmology clinic by her infectious disease physician 2 weeks after the onset of her symptoms to rule out retinal hemorrhages in view of her thrombocytopenia. Her best-corrected visual acuity (BCVA) at initial examination was 6/6 in both eyes. Pupillary responses and intraocular pressure were normal. Anterior segment examination did not reveal any abnormalities. Fundus examination showed bilateral darkened patches over the foveae in both eyes (Fig. 1). Optical coherence tomography was normal (Fig. 2).

At 2 weeks follow-up, the patient still complained of gray patches over both eyes, although they were less dark. BCVA remained at 6/6 for both eyes. Fundus examination showed persistent dark patches over bilateral foveae (Fig. 3). Humphrey visual fields using central 10-2 threshold testing showed left and right focal central scotomas (Fig. 4). Infrared fundus photography revealed dark patches in the right foveal and left parafoveal regions (Fig. 5). Interestingly, these patches corresponded to the darkened grayish patches drawn by the patient on Amsler grid testing (Fig. 6). The patient did not see any missing or distorted lines on the latter.
She was diagnosed with dengue maculopathy and given a follow-up in 6 weeks, and advised to return immediately if the symptoms worsened or vision dropped. At the 6 weeks follow-up visit, the patient was still aware of the scotomas although they appeared smaller on Amsler grid testing. She was seen 2 months later, where the scotomas were still present, but the pigmentation on the macula was less obvious on slit lamp examination.

DISCUSSION

Dengue has become a major international public health concern in recent years, with a global resurgence of epidemic DF and DHF due to the geographic spread of both the mosquito vectors and the viruses.9 Of particular interest to ophthalmologists in Southeast Asia and the region would be the wide spectrum of ophthalmologic manifestations seen in dengue maculopathy and retinopathy.

In the series by Chan et al ocular complications included both the peripheral retina in the posterior segment and the anterior segment (anterior uveitis).4 In another series by Lim et al ocular complications were mainly confined to the maculae, as was seen in our patient.5 The difference in disease extent probably reflects the varying extent of inflammatory process involving the eye. Similar to what has been previously reported, our patient’s ocular symptoms manifested at or close to the moment when the serum platelets and leukocytes levels reached their trough, as well as 5 to 7 days from the onset of dengue fever. This parallels the proposed immune-mediated inflammatory mechanism of dengue maculopathy, which involves induction of cross-reactive T-cell memory, T-cell proliferation, and recognition of dengue viral antigens on infected monocytes by sensitized CD4 + CD8 – and CD4 – CD8 + cytotoxic T-cells.10,11

Another mechanism proposed for dengue maculopathy is the thrombocytopenic state resulting in bleeding tendency and retinal hemorrhages.5 Although our patient had thrombocytopenia, she did not have any retinal vasculopathy manifesting as intraretinal hemorrhages or vascular sheathing, which has been reported by to be the most common ocular manifestation of dengue.5

Optical coherence tomography has been found to be extremely useful in diagnosing foveolitis in dengue maculopathy, diagnosed as an area of focal outer neurosensory retina—RPE thickening at the foveal center as identified on OCT.5 However, the OCT for our patient was normal. Instead, we found infrared fundus photography to be extremely useful in delineating the lesions on both maculae. As seen in Figures 5 and 6, the abnormal dark lesions seen in bilateral maculae on infrared fundus photography corresponded to the visual defects noticed by
this simple test was extremely helpful in confirming the presence of dengue maculopathy. Further testing with FFA or ICG was not performed as the patient did not demonstrate signs of macula edema or hemorrhage.

The treatment for dengue maculopathy is not clear-cut. Bascal et al opted to treat patients primarily with corticosteroids in view of the immune-mediated hypothesis as they believed the prevention of structural damage and permanent visual loss due to ocular inflammation justified treatment unless contraindicated. However, they also questioned if the disease itself was self-limiting, and hence chose not to treat those with better initial BCVA, and treated only those with worse involvement and hence poorer BCVA at initial examination. In the series by Chan et al only 2 out of 11 patients were treated with corticosteroids, but all patients recovered in the same manner and speed in terms of visual symptoms and visual acuity. Our patient was not started on any treatment as her BCVA remained 6/6 from initial visit and in subsequent follow-up consultations. Fundus examination also did not demonstrate any signs of vasculitis or edema.

There has been an increased in incidence and awareness of DF and DHF in Singapore and around the region. The optimal management of patients with DF or DHF requires physicians and ophthalmologists to be aware of the ophthalmic complications of these disease entities. Patients with a suspicion of dengue-related ophthalmic complications require early fundus examination aided by simple clinical tests, such as Amsler grid eye test and investigations including OCT, FFA and Humphrey perimetry. Infrared fundus photography is useful in delineating suspicious lesions that may not be well seen on fundus examination, or in cases where OCT is normal.

REFERENCES


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