

Dengue maculopathy: case reports**Kwong-Han Kiu^{1,2}, Hanizaturana Hashim¹, Roslin-Azni Abdul-Aziz¹, Shelina Oli-Mohamad¹, Nor-Fariza Ngah¹, Embong Zunaina²**¹Department of Ophthalmology, Hospital Selayang, Selayang, Selangor, Malaysia²Department of Ophthalmology, School of Medical Sciences, University Sains Malaysia, Kubang Kerian, Kelantan, Malaysia***Corresponding author**

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Abstract: We report a case series of dengue maculopathy. All two cases were diagnosed to have dengue fever and presented with central scotoma (case 1) and blurring of vision (case 2) around 5 to 7 days after the onset of fever. Fundus examination showed macular haemorrhages (case 1 and case 2), cotton wool spot (case 1) and macular edema (case 1 and case 2). Optical coherence tomography revealed macular thickening with intra retinal fluid (case 1) and sub retinal fluid (case 2). Fundus fluorescence angiography showed vasculitis changes at the posterior pole (case 2). All patients showed low platelet count at the time of ocular presentation (cases 1: $67 \times 10^3/\mu\text{l}$, case 2: $68 \times 10^3/\mu\text{l}$). Case 2 showed improvement of vision after administration of systemic steroid while there was spontaneous vision recovering in case 1. The improvement of vision is difficult to be determined whether is due to the treatment itself or part of the natural course of the disease.**Keywords:** dengue eye disease, vasculitis, foveolitis, dengue maculopathy.

INTRODUCTION

Dengue fever, a viral epidemic, which increase tremendously, especially in tropical and subtropical region had recently become major public health concern. The disease not only can cause mortality but morbidity which include dengue eye disease [1]. And among of these, dengue maculopathy is the most common involved [2]. Herein, we report a case series of dengue eye disease present in our centre.

CASE REPORTS**Case 1:**

A 40-year-old lady was diagnosed to have dengue fever, presented with bilateral central scotoma for 3 weeks duration. The central scotoma started 1 week after the onset of fever. She has no eye pain or floaters. She claimed her vision improve over a week after. Her platelet count during day 5 of dengue fever was $67 \times 10^3/\mu\text{l}$. However, she only came for eye examination 1 month after the onset of central scotoma. Vision examination was 6/9 in both eyes. There was no anterior chamber activity and absence of vitreous cells. Right fundus examination showed presence of multiple dot and blot macular hemorrhages with cotton wool spot and macular edema (Figure 1). Left fundus showed macular edema. Optical coherence tomography (OCT) revealed bilateral macular thickening with intra retinal fluid (Figure 2). Her platelet count on presentation was $269 \times 10^3/\mu\text{l}$ (1 month after the onset of fever). Systemic steroid was not instituted since the vision was

good. Review at 3 weeks later, there was regression of macular thickening and resolution of macular hemorrhages.

Case 2:

A 26-year-old lady was diagnosed as having dengue fever confirmed by positive serological test, complained of sudden bilateral painless blurring of vision on day 8 of fever. Apart from that, there was no other eye complaint. Her right eye vision was 6/36 and 6/60 in the left eye. Anterior segment examination was normal with no vitreous cell in both eyes. Fundus examination showed bilateral multiple dot and blot macular hemorrhages with macular edema (Figure 3). OCT showed extensive sub retinal fluid bilaterally (Figure 4). Fundus fluorescein angiogram revealed bilateral vasculitis changes at the posterior pole with no vascular occlusion (Figure 5). Her platelet count was $68 \times 10^3/\mu\text{l}$ with increase liver enzymes activity (Aspartate Aminotransferase:486 IU/L, Alanine Aminotransferase: 284 IU/L). In view of presence of retinal vasculitis, she was treated with intravenous methylprednisolone 250 mg 6-hourly for 3 days then followed by oral prednisolone 60 mg daily for 1 week. The oral prednisolone treatment was tapered down slowly within the next 2 months. On follow up at 3 weeks, her vision improved dramatically, 6/12 in the right eye and 6/24 in the left eye with resolving of macular hemorrhages and edema. Repeat OCT showed complete resolution of sub retinal fluid in both eyes (Figure 6).

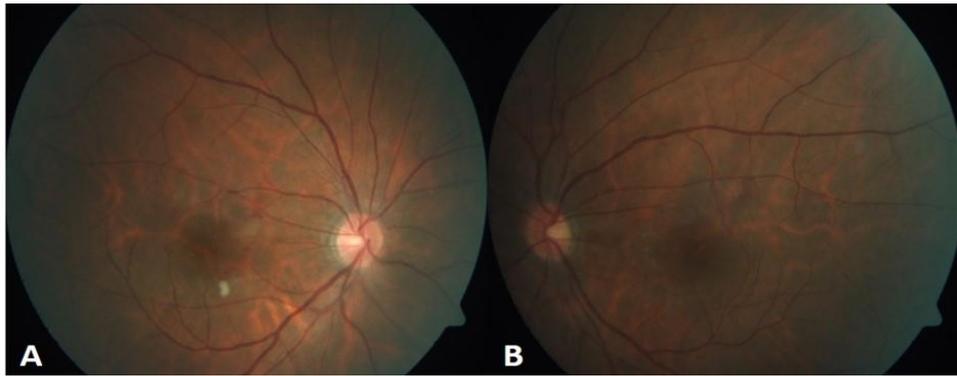


Fig 1: Eye of case 1 at presentation.

The right eye showed multiple dot and blot macular haemorrhages, cotton wool spot and macular edema. The left eye showed macular edema. [(A) Right eye, (B) left eye].

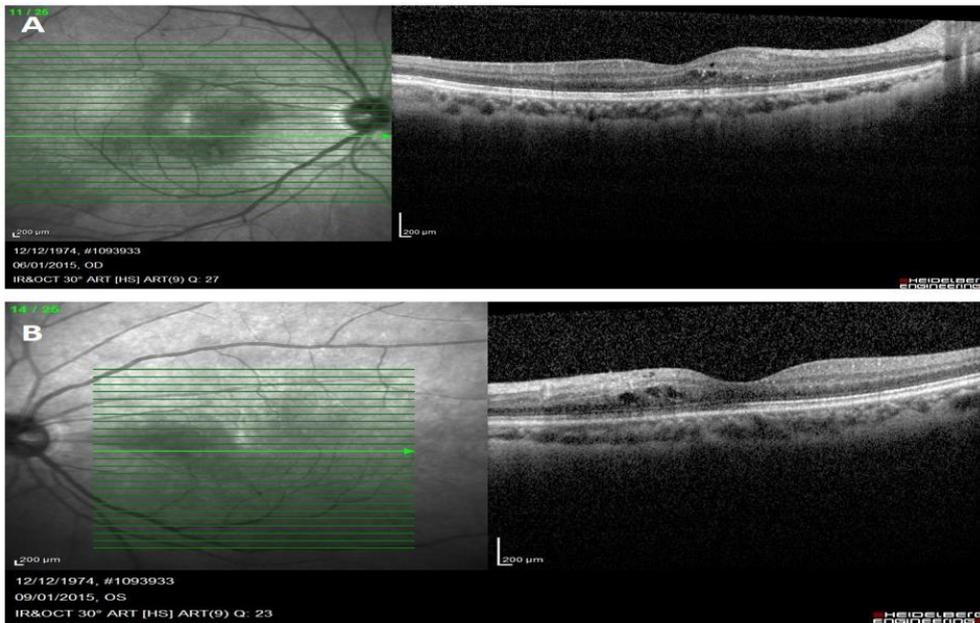


Fig 2: OCT of case 1 at presentation

OCT showed macular thickening with intra retinal fluid in both eyes. [(A) Right eye, (B) left eye].
Abbreviation: OCT, optical coherence tomography.

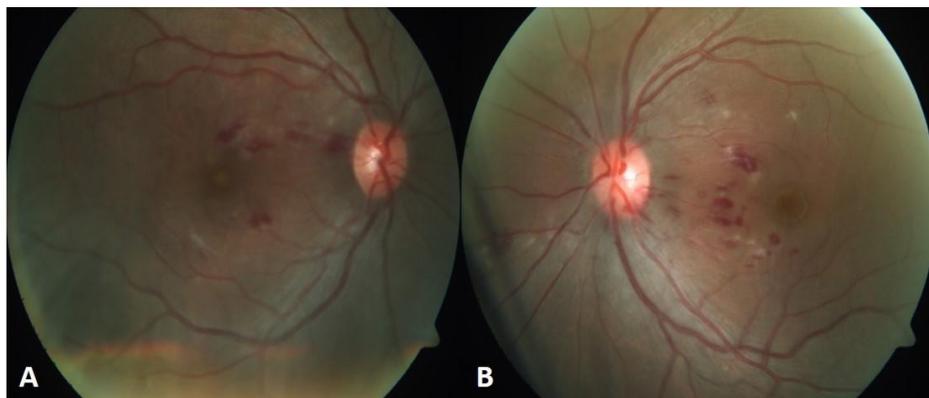


Fig 3: Eyes of case 2 at presentation

Fundus photo showed multiple dot and blot macular haemorrhages with macular edema in both eyes. [(A) Right eye, (B) left eye].

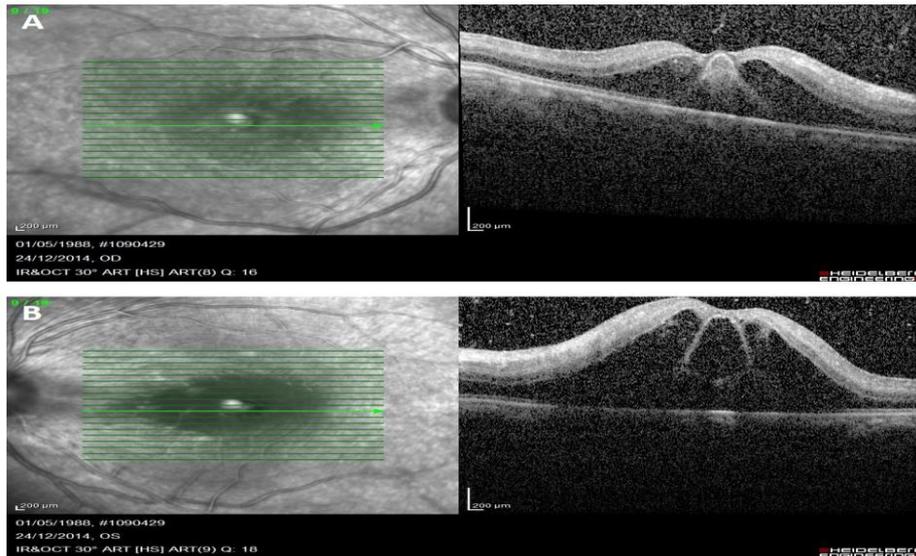


Fig 4: OCT of case 2 at presentation

OCT showed extensive sub retinal fluid in both eyes [(A) right eye, (B) left eye].
Abbreviation: OCT, optical coherence tomography.

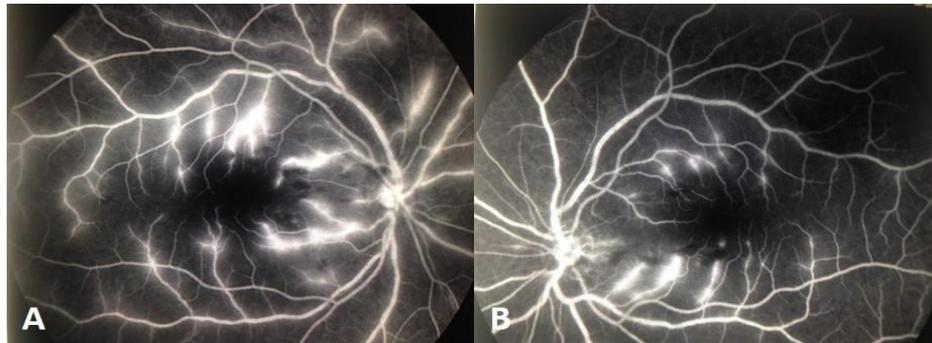


Fig 5: FFA of case 2 at presentation.

FFA showed bilateral vasculitis changes at the posterior pole. [(A) right eye , (B) left eye].
Abbreviation: FFA, fundus fluorescein angiogram.

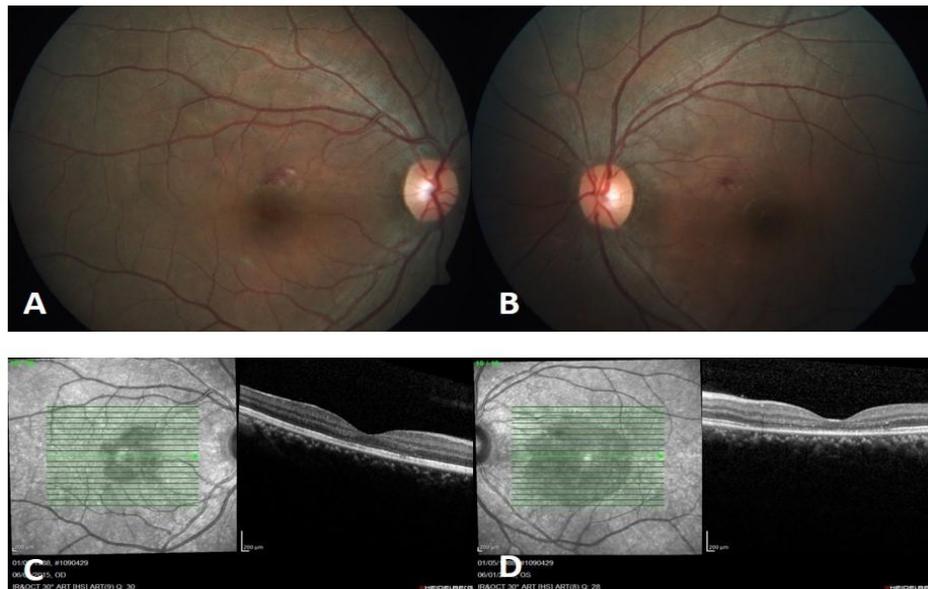


Fig 6: Fundus and OCT of case 2 post treatment.

Fundus photo showed resolving macular hemorrhages and edema in both eyes. [(A) right eye and (B) left eye].
OCT showed complete resolution of subretinal fluid in both eyes. [(C) right eye and (D) left eye].

Abbreviation: OCT, optical coherence tomography.

DISCUSSION

Dengue infection results in significant morbidity and mortality [3]. Over 2.5 billion are now at risk from the dengue [3]. WHO currently estimate there may be 50-100 million dengue infection worldwide every year [3]. The disease had shown increasing trend over the past decade especially in tropical and subtropical region [4]. It also mostly affecting urban area where there is no proper development planning [4].

The disease is caused by dengue virus which transmitted by mosquito to the human [3]. The main vector are *Aedes aegypti* and the virus belong to the flavivirus family [4]. Although pathogenesis of the dengue fever is not well elucidated yet but current research had pointed to the immunological reaction [5].

Ocular manifestation in dengue fever is rare. Among all the ocular manifestation, dengue maculopathy is the commonest complication occur during the infection [5]. Symptom of dengue maculopathy were observed to start at the mean of 6.9 days after the onset of fever (range 0-30 days) [5]. Majority of ocular symptom occur at the nadir of thrombocytopenia, approximately 7 days after the onset of fever, when there is an increase of immunological response [5].

In one study, 24.1% of patient hospitalized with dengue maculopathy reported visual symptom [6]. Blurred vision (87%), scotomata (63%) and floaters (1%) were the main visual complaint [6]. Less common symptoms were micropsia and metamorphopsia [6]. Common fundus finding include macular edema, dot and blot retinal hemorrhage, foveolitis and cotton wool spot [5].

In our case, both patients were presented with similar symptom 1 week after onset of fever at the lowest level of thrombocytopenia which is correlated well with the previous study. However case 2 had more severe visual impairment compare to case 1. These may explain the variety of manifestation and its severity in onset. Perhaps individual of different severity to the vision at onset, likely due to different immune response. Association with other complication may present with more severe visual symptom as in case 2 which also accompany with trans aminitis.

Currently there is no specific treatment for dengue maculopathy and there are no randomized control trial to date [5]. Treatment are individualized and based on clinical [5]. Surveillance and steroid therapy remain to be the active modalities used. At present, there is no evidence as to whether immunosuppressive therapy has additional benefit to improve prognosis and hasten the recovery [5].

In our case, the use of steroid whether topical or systemic successfully improve the vision outcome of the 2nd patients. However, more study needed to prove its efficacy as well as treatment outcome related to the severity of the disease. In case 1, evidence of improvement showed in OCT even no treatment was given. In a retrospective study done in Singapore, patients diagnosed to have foveolitis were treated with immunosuppressive. All patients experience improvement in vision. The improvement of vision is difficult to be determined whether is due to the treatment itself or part of the natural course of the disease. Thus a prospective randomized clinical study needs to be conducted to determine the effect of the treatment [7].

CONCLUSION

Dengue related eye disease are rare, however it may cause permanent vision impairment. Currently treatment was based on clinical, and outcome was variable. Hence eye screening was recommended for those presented with eye disturbance in dengue patient.

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