

Globe Rupture – A Rare Ocular Manifestation of Dengue Fever in Convalescent Phase

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Abstract: Dengue fever, also known as breakbone fever, is a mosquito-borne tropical disease caused by the dengue virus (DENV), a flavivirus, spread by *Aedes aegypti* mosquito. Most people infected with dengue virus are asymptomatic or only have mild symptoms such as an uncomplicated fever. Severe dengue is defined as that associated with severe bleeding, severe organ dysfunction, or severe plasma leakage. Ophthalmic manifestations can involve both the anterior and posterior segment and are usually associated with a low platelet count. We report an ocular emergency of acute retrobulbar, intrabulbar hemorrhage, and globe rupture as a rare complication of a patient with dengue in the convalescent phase, with normal platelet counts.

Keywords: Dengue, Globe Rupture, Ocular Emergencies, Ophthalmic Emergencies

1. Introduction

Dengue, a self-limiting fever, is the most common mosquito-borne viral disease of humans. It is caused by a flavivirus transmitted by the *Aedes aegypti* mosquito. The highest incidence occurs in Southeast Asia, India, and the American tropics^[1]. Patients with dengue fever may also report visual symptoms, the most common being blurring of vision. These need prompt evaluation for any serious complications. Although there is no specific therapy, ophthalmic manifestations may be an indication for early and aggressive correction of thrombocytopenia.^[2] We report a case of dengue fever who presented as an ocular emergency.

2. Case Report

A 31 year old male presented with complaints of fever with myalgia since 3 days. On admission his temperature was 100°F, blood pressure was 100/60 mm of Hg, and pulse was 110 beats per minute. He didn't have any other complaints. On investigation, the peripheral smear was negative for malarial parasite and all other routine investigations were within normal limits except for thrombocytopenia with platelet counts of 15,000/microliter (normal 150,000-450,000/microliter) at the time of admission. On further investigation he was found to be Dengue NS-1 antigen positive. He didn't have any signs or symptoms of active bleeding tendency such as bleeding gums, hematuria, or gastrointestinal bleed. He continued to be afebrile since after admission, and continued to be asymptomatic, apart from generalized myalgia. He was given supportive treatment and no platelet transfusion was given. On the 6th day of admission, his platelet counts rose to 241,000/microliter, and on that day, the patient developed sudden onset acute painful blurring of vision progressing to loss of vision upto only light perception in the right eye, with severe pain and redness of eye within 1 hour of onset of symptoms.

On ophthalmic evaluation, the left eye was normal, while the vision in the right eye was no perception of light. Anterior segment evaluation revealed proptosis, lid edema, chemosis subconjunctival hemorrhage, and total hyphema. Furthermore, on fundus examination, media showed fresh vitreous hemorrhage, optic disc revealed blurred disc margin, macula showed cherry red spots. B scan ultrasonography revealed a vitreous, suprachoroidal, and retrobulbar hemorrhage. MRI brain was done, which revealed retrobulbar hemorrhage with a possibility of optic neuritis with no other significant findings. Mannitol was started, along with acetazolamide. Pressure pad was also applied, with local application of betnesol and Iotim % eyedrops, with Hypersol – 5 eye ointment. The next day, the patient's vision in the right eye progressed to complete loss of any light perception, with restricted ocular movements in all quadrants, increasing proptosis, chemosis, with a hazy, opaque, and hemorrhagic cornea, with hyphemia in the anterior chamber.

Furthermore, the patient developed panophthalmitis of right eye the next day, with proptosis and globe rupture, following which he underwent evisceration of right eye. Systemic antibiotics, with steroids and supportive treatment was given post operatively. He was eventually discharged after 3 days post operatively, and on follow up, he continued to have preserved vision of the other (left) eye without any sequelae or complications.



Figure 1: Affected eye of the patient showing chemosis

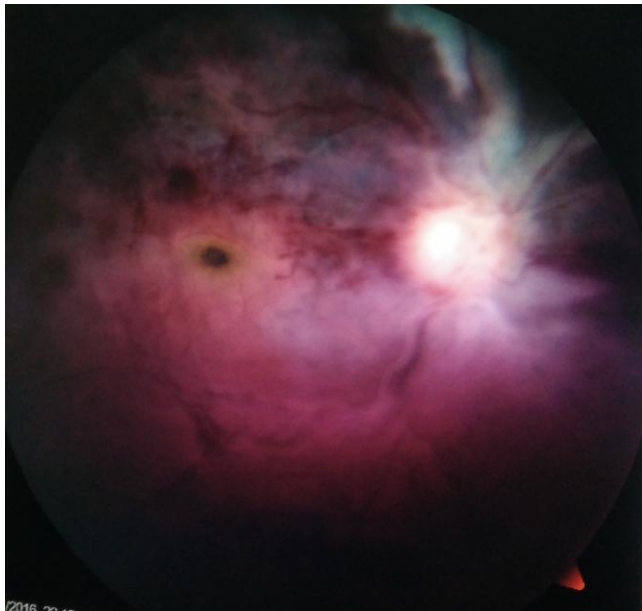


Figure 2: Fundus of the affected eye showing hemorrhages



Figure 3: Vasculitis of small vessels of the retina

Table 1: Biochemical Findings

	On Admission	On Discharge
Hemoglobin (gm/dl)	13.5	15.1
Total Leucocyte Count (/cu. mm)	1510	5250
Platelet Count (/cu. mm)	15000	241000
Hematocrit	43.0	45.1

3. Discussion

Dengue is one of the most important viral diseases in India, placing a huge burden in terms of morbidity and mortality.^[3] It is a communicable disease transmitted by the bite of an Aedes mosquito infected with any one of the four dengue viruses (DEN-1, DEN-2, DEN-3 and DEN-4). Recovery from infection by one provides lifelong immunity against that particular serotype. Subsequent infections by other serotypes increase the risk of developing severe dengue (previously known as Dengue Hemorrhagic Fever).^[4]

Ophthalmic manifestations though rare and varied, range from subconjunctival hemorrhage to optic neuropathy with the posterior segment, particularly macular involvement, being the most common. In one study^[5], the most common common anterior segment findings were subconjunctival hemorrhage (45.8%), while the most common posterior chamber finding was retinal hemorrhages (87.5%). Though the pathogenesis of these changes is not yet known, their clinical presentation and behavior are indicative of an immunogenic etiology rather than infective^[6]. The course of the ocular complications is generally self-limiting. However, immediate high-dose steroids at presentation, followed by a rapid taper, has been suggested and tried with varying success to suppress and minimize the inflammatory damage.^[7]

Proptosis in dengue patients, secondary to panophthalmitis^[8] and due to retrobulbar hemorrhage,^[9] although rare, has been previously reported. The vitreous, suprachoroidal and retrobulbar hemorrhage could have multiple probable mechanisms, including occurred spontaneous hemorrhage^[10] due to thrombocytopenia and/or due to trauma from vigorous rubbing of the eye. There has been one case report^[11] of ruptured globe following proptosis, as seen in our patient. However, ruptured globe following proptosis secondary to retrobulbar hemorrhage with a normal platelet count in the convalescent phase of dengue fever, as seen in our patient, has been hitherto unreported. The possible mechanisms for globe rupture could be an increase in intraorbital pressure and IOP secondary to retrobulbar and intraocular hemorrhage. The causes of hemorrhage could be thrombocytopenia with coagulation defects, capillary fragility, consumptive coagulopathy and platelet dysfunction.^[12]

A number of mechanisms have been described or theorized behind the pathophysiologic processes involved^[13]. These include the thrombocytopenic state, occult vascular changes with minimal functional disturbance, hyperpermeable and inflammatory states. The onset of visual symptoms occurs on or close to the day of the lowest serum platelet level^[14]. However in our patient, the platelet levels were well above normal at the time of onset of visual symptoms. Thus, other mechanisms may play an equally important role in the pathogenesis of the visual manifestations.

4. Conclusion

In conclusion, we present a hitherto unreported ocular emergency of globe rupture and proptosis in dengue with a

normal platelet level. We need to be aware of all the possible ophthalmic complications in patients with severe dengue and especially be vigilant of sight threatening complications.

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