

## Case Report

# Spontaneous globe rupture in dengue: A case series

### ABSTRACT

Dengue is the most common mosquito-borne viral disease in humans. It has now become a major public health problem in India. Various ophthalmic manifestations are seen in dengue. Globe rupture is a very rare complication. Ophthalmologists should be aware of this complication, to suspect and intervene early in the clinical course. We report three cases of spontaneous globe rupture presented to our emergency department following dengue. This is the largest case report on the subject till date.

**Keywords:** Complication, dengue, globe rupture, panophthalmitis

### INTRODUCTION

Dengue is caused by four different serotypes DEN1, DEN2, DEN3, and DEN4 viruses belonging to flavivirus genus (family-flaviviridae). All four serotypes are found in India. The disease is transmitted by female *Aedes aegypti* and *Aedes albopictus* mosquitoes. Usual manifestation is a short febrile illness dengue fever. Dengue hemorrhagic fever and dengue shock syndrome can occur in severe cases.<sup>[1]</sup>

Vision-threatening ocular manifestations are usually seen when platelet level is critically low.<sup>[1]</sup>

### CASE REPORTS

#### Case 1

A 72-year-old male presented with acute bleeding from the left eye 10 days after the onset of dengue fever. He had swelling and redness in the left eye 3 days before this while he was on treatment from another center for dengue. The patient had no comorbidities. On examination, the left eye had periorbital edema, 360° hemorrhagic chemosis, and corneal perforation at the temporal limbus with reddish-brown discharge. The anterior chamber was collapsed. Details of iris, lens, and fundus were not appreciable [Figure 1]. Intraocular pressure (IOP) was digitally low, and the documented vision was light perception with inaccurate projection. The right eye was normal with 6/36 vision.

Investigations showed platelet count of 1.73 L. However, the lowest count was 50,000 cells/mm<sup>3</sup> recorded from the previous center 2 days before presentation. Blood parameters were within normal limits. ANA and anti-dsDNA were negative. Swab culture was sterile, and computed tomography (CT) orbit revealed proptosis of the left eye and periorbital inflammation. He was managed with topical and systemic antibiotics and supportive measures. Since there was purulent discharge after 3 days, it was planned for intravitreal antibiotics. But in view of panophthalmitis, the eye was eviscerated [Figure 2]. Repeat culture sent at the time of evisceration was negative. The wound healed well, and he is under follow-up.

#### Case 2

A 72-year-old female presented with bleeding from the right eye, which was preceded by redness, pain, and swelling of the eye for 5 days. The patient had metabolic encephalopathy at presentation due to hyponatremia. She

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had a history of dengue fever 2 weeks back and was on treatment in another center.

On examination, the right eye had periorbital edema, 360° hemorrhagic chemosis, and central corneal perforation with brownish discharge. Details of other structures were not made out. IOP was digitally low [Figure 3]. The left eye was normal except for a mild chemosis. Vision could not be assessed at the time of presentation due to disorientation.

Platelet count was 1.98 L/mm<sup>3</sup> at presentation. The lowest count was 18,000/mm<sup>3</sup> 2 days before commencement of ocular symptoms. Serum sodium level was 106 mEq/L. Other blood parameters were normal. Conjunctival swab sent was sterile. CT orbit is taken from the previous center before rupture showed minimal proptosis, increased intensity in the anterior chamber, and vitreous with distortion of the eye contour. All features were suggestive of panophthalmitis right eye [Figure 4].

She was treated with topical and parenteral antibiotics, pressure bandage, and other supportive measures. Hyponatremia was corrected. Her sensorium improved after 2 days. Vision in the right eye was PL- and that of in left eye was 6/24. The right eye became phthisical and she is under follow-up.

### Case 3

A 65-year-old female who had just recovered from dengue shock syndrome (managed from elsewhere) presented to emergency department with swelling and pain of the right eye for 3 days. She had systemic hypertension, and was on regular medication.

She was conscious and oriented, and vitals were stable. The right eye had periorbital edema and erythema with 360° hemorrhagic chemosis. The cornea was clear. The anterior chamber was shallow with exudates in pupillary area. Pupillary reflexes were absent. IOP was digitally high and lens



Figure 1: Case 1: A 72-year-old male with globe rupture at temporal limbus – left eye



Figure 2: Case 1: Panophthalmitis stage, at the time of enucleation



Figure 3: Case 2: A 72-year-old female with central corneal perforation – right eye

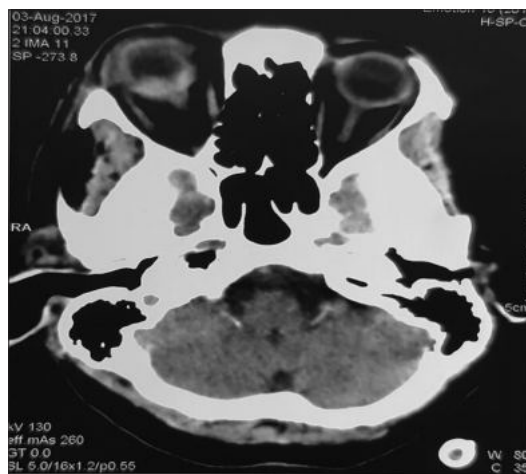


Figure 4: Case 2: Computed tomography orbit showing panophthalmitis right eye



Figure 5: Case 3: A 65-year-old female at presentation, with yellow reflex in pupillary area

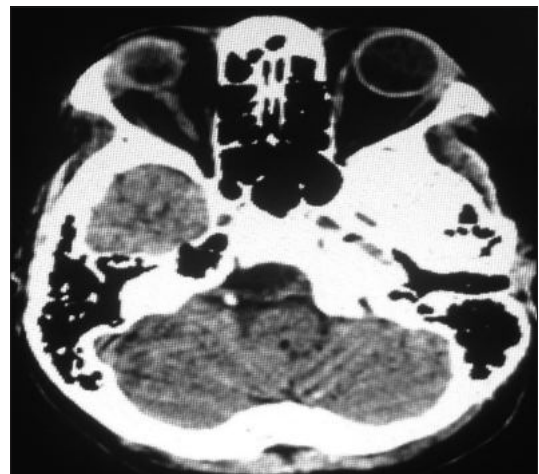


Figure 6: Case 3: Computed tomography orbit showing orbital cellulitis right eye

details not made out because of exudates. The vision was PL- in the affected eye [Figure 5]. The left eye had minimal chemosis with a vision of 6/12.

Her platelet count was 73,000/mm<sup>3</sup> (lowest count - 35,000/mm<sup>3</sup> 2 days before presentation). Other parameters were within normal limits including LFT and RFT. CT and MRI features were suggestive of orbital cellulitis of right eye [Figure 6].

She was treated with topical and parenteral broad-spectrum antibiotics, mannitol, pressure bandage, and other supportive measures. On second day there was spontaneous rupture in the center of cornea with pus. *Proteus mirabilis* was isolated from the swab culture. Antibiotics changed according to the sensitivity pattern. She was improved symptomatically and the eye was phthisical at the time of discharge. Now, she is under follow-up.

## DISCUSSION

Ophthalmic manifestations of dengue vary considerably and are increasingly being reported recently. These include subconjunctival hemorrhage,<sup>[1]</sup> retinal hemorrhages,<sup>[1]</sup> macular edema,<sup>[1]</sup> foveolitis,<sup>[2]</sup> central retinal vein occlusion,<sup>[3]</sup> central retinal artery occlusion,<sup>[1]</sup> retinal vasculitis,<sup>[4]</sup> anterior uveitis,<sup>[1,4]</sup> neuroretinitis,<sup>[1,4]</sup> optic neuropathy,<sup>[1]</sup> panophthalmitis,<sup>[5]</sup> and rarely globe rupture.<sup>[6,7]</sup>

The onset of ocular symptoms usually coincides with the lowest platelet count. Most of the cases recover spontaneously without treatment. Systemic steroids are useful in patients with severe visual loss and bilateral involvement.<sup>[1]</sup> Only, a few reports are there in the literature on dengue panophthalmitis<sup>[5,8]</sup> and globe rupture.<sup>[6,7]</sup>

It is postulated that immunological mechanisms mediated by T cells, and inflammatory cytokines are responsible for the ocular complications along with thrombocytopenia. Vasoactive and inflammatory mediators such as ILs, tumor necrosis factor, platelet-activating factor, and urokinase cause capillary leakage, which is responsible for the macular edema and breakdown of blood-aqueous barrier leading to uveitis and periphlebitis.<sup>[1,2,4]</sup> Platelet dysfunction and consumptive coagulopathy also contribute to the pathology.<sup>[4]</sup>

Proptosis in dengue fever could be due to retrobulbar hemorrhage or panophthalmitis.<sup>[5]</sup> Possible mechanism for globe rupture could be an increase in intraocular and intraorbital pressure secondary to retrobulbar, suprachoroidal, and intravitreal hemorrhages.<sup>[6,7]</sup> Exact etiology of panophthalmitis is not known. It may be due to the viremia causing embolization of infective material through retinal vessels, occurring at the nadir in platelet count. After establishing a septic focus in the retina, infection could have disseminated throughout the retina, vitreous, and anterior segment.<sup>[8]</sup>

In conclusion, dengue eye disease is emerging as a major cause of ocular morbidity. This case series is reported for its rarity and also to stress the need to be vigilant of the vision-threatening complications, so that measures if possible can be taken early to prevent such complications.

## 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.

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### Conflicts of interest

There are no conflicts of interest.

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