

# A Rare Convergence: Dengue Maculopathy and Encephalopathy in a Diabetic Patient

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**Abstract:** *Dengue fever, caused by Flaviviridae RNA virus, ranges from asymptomatic to multiple - organ dysfunction. <sup>1</sup> Dengue typically presents with symptoms like fever, myalgia, headache, vomiting, low platelets, and positive NSI test. Rarely, it can also cause ocular issues like macular edema, retinal haemorrhage<sup>2</sup> and neurological manifestations such as encephalopathy, due to complications like shock and hepatitis; both of which were observed in our patient. A 35-year-old diabetic male with severe dengue fever presented with fever with chills, body aches, headache, joint pain and burning micturition for 3 days. On Day 4, he experienced sudden, painless blurred vision in both eyes, along with vomiting, generalised weakness, and a non - palpable rash. He had generalised swelling with redness. Ocular examination revealed reduced visual acuity and macular edema in both eyes. Patient shows initial normal Hb, hematocrit, and WBC. By Day 4, there's severe thrombocytopenia, elevated liver enzymes and coagulation abnormalities. MRI showed focal diffusion restriction in the splenium of the corpus callosum, consistent with Mild Encephalopathy with Reversible Splenial Lesion (MERS). Dengue NSI was positive. Initially managed with aggressive fluid resuscitation and symptomatic care, then treated with systemic corticosteroids (dexamethasone) for ocular and neurological symptoms, alongside levetiracetam for seizure prevention. Corticosteroids minimise structural damage and prevent vision loss from ocular inflammation caused by an immune response. <sup>3</sup> Vitamin K corrected coagulation issues, and additional treatment included Nepafenac eye drops, topical NSAIDs, and multivitamins. Blood glucose levels were closely monitored and controlled with insulin due to diabetes. By Day 8, the patient showed significant improvement and was discharged with complete recovery. We report a rare case of a 35-year-old diabetic male with dengue fever, presenting with both maculopathy and mild encephalopathy with reversible splenial lesion (MERS). MERS may have either infectious or non - infectious causes like hypernatremia, hypoglycemia, withdrawal of anti - epileptic drugs and so on. <sup>4</sup> Timely recognition of dengue as a potential cause by the physician is vital for initiating appropriate treatment, leading to faster recovery and disease remission.*

**Keywords:** dengue fever, maculopathy, mild encephalopathy, thrombocytopenia, dengue treatment

## 1. Introduction

Dengue fever is a mosquito - borne disease, primarily caused by single stranded RNA virus of the Flaviviridae family causing an infection with no symptoms to one that is severe, affecting multiple - organ dysfunction. <sup>1</sup> Normally, dengue patients have complaints of fever, myalgia, headache, vomiting with hemogram suggestive of reduced platelets count, and Dengue NS1 Antigen test positive (>0.9) but the co - occurrence of ocular and neurological manifestation is a rare entity. Apart from blurring of vision, scotoma, or floaters, dengue ocular illness might also present with vitreous and retinal haemorrhage, uveitis or optic neuritis. <sup>2</sup> And dengue encephalopathy is usually secondary to other system dysfunction like shock, hepatitis, and concurrent bacterial infection. So, here we report a very rare case of a diabetic patient with severe dengue, and hepatitis who also had uncommon complications of dengue maculopathy with mild encephalopathy.

## 2. Case Presentation

A 35 year old diabetic male patient with severe dengue fever presented with chief complaints of fever with chills, body ache, headache, joint pain and burning micturition for 3 days. On day 4 of illness, he came to see us with a sudden, painless blurring of vision in both of his eyes since 2 days

along with 4 episodes of vomiting which was non - bilious, non - projectile, non - blood stained and generalized weakness with appearance of non - palpable rash all over the body for 4 days. It was not associated with redness of eye, pain, discharge, and photophobia.

On admission, he was febrile, with a temperature of 100°F, pulse of 110/min, blood pressure of 110/70 mmHg. On pulse oximetry, oxygen saturation was 98% on room air. Patient had generalised swelling with redness. Pallor, icterus, cyanosis and clubbing were absent.

On ocular examination, the best - corrected visual acuity was 6/12 in both eyes. Fundus examination revealed bilateral macular edema with no evidence of disc edema or diabetic retinopathy.

The neurological examination did not reveal any significant abnormality. The rest of the systemic examination was also within normal limits. He was resuscitated with fluids.

## 3. Investigations and Findings

The following table shows the progressive changes observed in important parameters of complete blood count, liver function test, renal function test, Urine routine microscopy:

	Day 1	Day 4	Day 6	Day 8
Hb (gm/dL)	14.6	18.5	15.5	15
Hematocrit (%)	44.3	55.6	46.3	43.9
WBC (per cmm)	7800	12250	9460	8520
Platelets (per cmm)	282000	26000	88000	136000
Creatinine (mg/dL)		0.95		
Uric acid (mg/dL)		7.7		
SGOT (AST) (U/L)	22.2	116	58.1	38
SGPT (ALT) (U/L)	39.4	96.7	63.1	41
CRP (mg/L)	14.07	13.1		
APTT (seconds)		38.9	32	
PT (seconds)		18.2	15.7	
HbA1c (%)	11.2			
Urine routine microscopy	Glucose 3+ Ketone bodies - Trace Protein - Trace Leukocytes - Trace	Glucose 3+ Ketone bodies 2+ Blood 2+ Leucocyte s - Trace Erythrocyt e - 15 - 20/hp f		

(APTT - Activated partial thromboplastin time; PT - Prothrombin time)

An MRI Brain scan was done which showed focal area of diffusion restriction, involving splenium of corpus callosum and appeared mildly hyperintense on T2/FLAIR - likely of Mild Encephalopathy with reversible splenial lesion (MERS). STIR/ T2FS coronal/axial scan was done for the screening of orbits which revealed no significant abnormality in bilateral orbits including optic nerve.

On Day 4, Dengue non - structural protein 1 (NS1) antigen assay was positive, with complete blood count marked reduction of platelet count, i. e. 26000. The liver transaminases (ALT, AST) were significantly elevated along with derangement of coagulation profile (APTT, PT) suggestive of hepatitis.

The peripheral smear showed no evidence of malarial parasites. Chikungunya antibodies were negative. Titers for Hepatitis viruses (HBsAg, HCV) and HIV were negative. The blood and urine culture did not show any growth. Serum ammonia and electrolytes were within normal limits. Over the days with adequate treatment, his platelet count and liver functions subsequently improved.

#### Management and Outcome:

The patient was initially managed with aggressive fluid resuscitation along with symptomatic treatment. Later on, with the development of ocular and neurological manifestation, the patient was started on systemic corticosteroids, i. e. dexamethasone, which was gradually tapered. He was given levetiracetam prophylactically to prevent the occurrence of seizures. Vitamin K injection was administered for the correction of coagulation profile. Additionally, Nepafenac eye drops, topical nonsteroidal anti - inflammatory drug, and injectable multivitamins were also given. Given the patient's diabetes, strict blood glucose monitoring became essential, especially following the start of corticosteroid treatment. Glucose levels were kept under control with insulin injections. The patient experienced significant symptom improvement on Day 8, indicating the adequacy of the treatment provided. He was subsequently discharged from the hospital on the eighth day of illness with complete recovery.

#### 4. Discussion

Dengue virus infections are one of the leading causes of hospital admissions in Central Gujarat. According to the

World Health Organisation (WHO) surveillance, the global incidence is on the rise.<sup>3</sup> Here, we present a rare case of a 35 years old diabetic male patient presenting with both ocular and neurological manifestation of dengue, with initial complaints of fever with chills, headache, myalgia, joint pain and later came to see us for diminution of vision and episodes of vomiting since 2 days. The diagnosis of dengue fever was confirmed through clinical evaluation, along with serological and hematological tests. Fundoscopic examination revealed macular edema, with visual acuity of 6/12 in both eyes. Dengue eye disease can affect one or both eyes. Ocular symptoms typically appear within one day of the lowest platelet count, around seven days after fever onset, although can appear anytime from 2 days to 5 months after the fever begins.<sup>2</sup> This is demonstrated by our patient, who exhibited the symptoms on Day 4 while having the disease's lowest platelet count around the same day. Though maculopathy resolves spontaneously with time, intravenous corticosteroid was given, to help reduce structural damage and prevent long - term vision loss caused by ocular inflammation, likely driven by an immune response.<sup>4</sup> In our patient, blood glucose level was monitored at regular intervals, and kept under control with insulin administration as uncontrolled glucose levels could potentially worsen the symptoms and lead to poor prognosis of the disease. Following treatment, the patient experienced improvement in vision, evidenced by improvement in visual acuity within three weeks.

Subsequent brain imaging confirmed the evidence of mild encephalopathy with reversible splenial lesion (MERS). Numerous neurological complications of dengue, include: (1) metabolic disturbances like encephalopathy, (2) viral invasion such as encephalitis and myelitis, and (3) autoimmune reactions like Guillain - Barré syndrome and optic neuritis.<sup>5</sup> The possible mechanisms include liver failure (hepatic encephalopathy), cerebral hypoperfusion (shock), cerebral edema (vascular leak), deranged electrolytes, and intracranial bleeding due to thrombocytopenia or coagulopathy, which is secondary to hepatic failure.<sup>6</sup> Reversible splenial lesion syndrome (RESLES) could have infectious and non - infectious associations. Similar radiological diagnosis can be caused by pathogens like influenza virus, rotavirus, herpes virus, measles, mumps, epstein - Barr virus and escherichia coli.<sup>7-11</sup> Among the non - infectious causes, RESLES has been reported in connection with the withdrawal of anti - epileptic

drugs, metabolic disorders like hypernatremia and hypoglycemia, and high altitude cerebral edema (HACE).<sup>12</sup>

## 5. Conclusion

In conclusion, when managing a patient with dengue, it's crucial not to overlook the potential for complications such as dengue encephalopathy and maculopathy. Fundus fluorescein, optical coherence tomography, and visual field testing are useful tools in the diagnosis of dengue maculopathy and other ocular diseases.<sup>13</sup> Further, Diagnostic tools for Neurological presentation in severe dengue include clinical assessments like neuroimaging (MRI or CT scans), EEG to evaluate brain activity, and lab tests to check liver function, electrolyte levels and lumbar puncture to rule out CNS Infections.<sup>14</sup> It highlights the importance of prompt recognition of the distinct clinical and radiological signs for timely identification, intervention and management of underlying aetiology. Swift action will therefore lead to lesser fatality and better prognosis of the disease.

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