

# Dengue Hemorrhagic Fever Presenting with Intracranial Extraaxial Hemorrhage

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## Abstract

A 50 yr old male presented with decreased consciousness following fever for consecutive 5 days. Blood pressure was 120/70, pulse rate 100/ min. Respiratory and cardiovascular system examination was normal. There was no abdominal distention or vomiting. Skin rash was absent. Jaundice was present.

Investigation showed blood leucopenia with moderate to severe anemia and thrombocytopenia. Chest X-ray was normal. ECG was normal and echocardiogram revealed small pericardial effusion. Liver function test revealed moderate hypoalbuminemia with mild hyperbilirubinemia.

Dengue NS 1 antigen test was positive. His decreased consciousness level in spite of normal hemodynamic stability prompted us to get a CT scan of brain without contrast followed by CSF study.

CT scan of brain revealed acute extra axial subdural hemorrhage(SDH) with extra dural hemorrhage(EDH) along right hemisphere with displacement of ventricle to the left. . CSF study was deferred due the presence of mass effect.

Conservative management was done with PRBC and platelet transfusions. As his sensorium and mass effect improvement occurred in following 3 days, the motor paresis of the patient did not significantly improve thereby prompting the neurosurgeon to perform surgical evacuation of SDH plus EDH. The patient had an uneventful recovery.

**Keywords:** Extra axial hemorrhage; Dengue; hemorrhagic fever; capillary leakage; craniectomy.



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## INTRODUCTION AND BACKGROUND

Dengue virus (DENV) is regarded as a potential neurotropic virus with the ability to infect and invade the central nervous system. Though rare, neural injury during the acute stage of the infection results from direct neuro-invasion and/or the phenomenon of antibody-dependent enhancement, resulting in plasma leakage in the extravascular compartments.

A myriad of neurological syndromes has been described as a result of the involvement of the CNS, particularly in dengue hemorrhagic fever, the most important being spontaneous hemorrhage in the brain parenchyma or extra-axial-viz. subdural, subarachnoid or in epidural compartments.

Though spontaneous subdural, subarachnoid or intraparenchymal bleed have been reported in few cases of dengue hemorrhagic fever, occurrence of epidural with subdural hemorrhage together is not found in the literature.

We present here a case of intracranial extraaxial hemorrhage in the form of both subdural and extradural components in a patient with dengue hemorrhagic fever without any history of trauma.

### CASE HISTORY

A 50 yr old male presented to the hospital emergency with history of continuous fever of moderate degree with head and bodyache for last 5 days. Fever occasionally remitted with oral paracetamol (650 mg tab). He developed sudden decrease in consciousness leading to drowsiness and disorientation for preceding 12 hrs.

There was no history of any trauma, fall, convulsion, hypertension or diabetes mellitus. There was history of dengue fever in several families in the neighborhood.

On examination the patient was febrile with temperature of 100°F. Jaundice was present. He was drowsy and disoriented with GCS score of 11/15 (eye opening 3/4, best verbal response 3/5, motor response 5/6). He did not have any dyspnoea and his SpO<sub>2</sub> was 98% at room air.

His left upper and lower limbs had hypertonia and hyperreflexia. Plantar response was extension in left foot.

His hemodynamic parameters were normal with pulse rate of 100/min, pulse volume and rhythm were normal, blood pressure 120/70, and normal capillary refill time (2 sec).

There was no skin rash or purpuric or ecchymotic patch anywhere in his body.

There was no abdominal distention or organomegaly.

His cardiovascular and respiratory system examinations revealed no significant abnormality.

Investigation of complete blood counts done outside before admission showed total leukocyte count 3400/cu.mm, differential count polymorph

66%, Lymphocyte 32%, Hb 6.8 gm%, total RBC count 3.2 m, PCV 23%, and platelet count 33,000/cu.mm.

**Dengue non structural antigen (NS1) was positive**

A non-contrast CT scan of head done few hours ago (Figure 1) showed presence of acute subdural hemorrhage (approximately 20 mm radius) overlying right frontal, temporal and parietal hemisphere with a middle shift of 9 mm to the left. Additionally there was acute epidural hemorrhage in right parietal area.

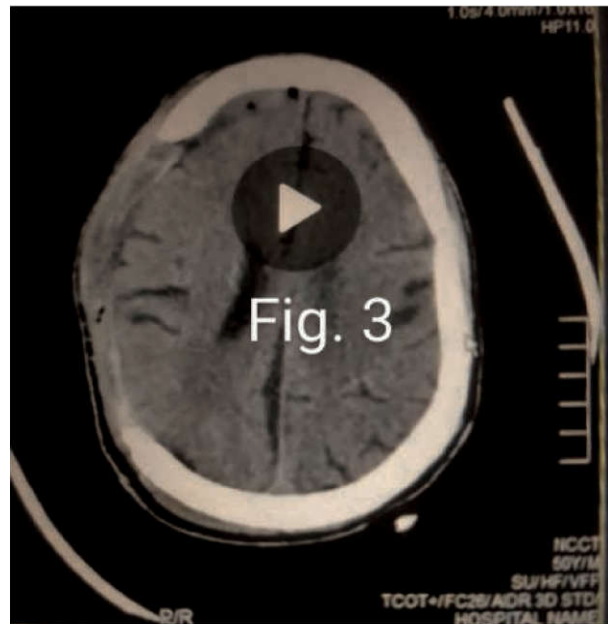


Fig. 1: Initial CT scan of brain.

His ECG was normal. Echocardiogram revealed chink of pericardial effusion. Liver function test showed serum protein 5.2 gm%, serum albumin 2.7 gm%. SGPT, SGOT were normal. Total serum bilirubin was 5 mg%, with direct bilirubin 1.4.

As there was no history or signs of trauma and the patient did not show papilledema or pupillary dilatation and there was no circulatory or respiratory compromise, he was kept on watchful expectancy with corrections of anemia and thrombocytopenia with PRBC and platelet transfusions respectively on emergency basis. Neurosurgeon consultation was sought who opined for continuing conservative management and planned surgical exploration after documented corrections of anemia and thrombocytopenia which was possible in next 48-72 hrs. However an urgent surgical evacuation was also kept under consideration in case the patient

showed neurological deterioration.

On 3rd day after admission and ongoing treatment patient's platelet count was 88000, and Hb was 8.8 gm%. His GCS improved to 13/15 (E 4/4 B 4/5, M 5/6).

CT scan of brain was repeated (Figure 2), which showed a decrease in the midline shift to 4 mm, and also a decreased volume of subdural and extradural blood (18 mm radius).

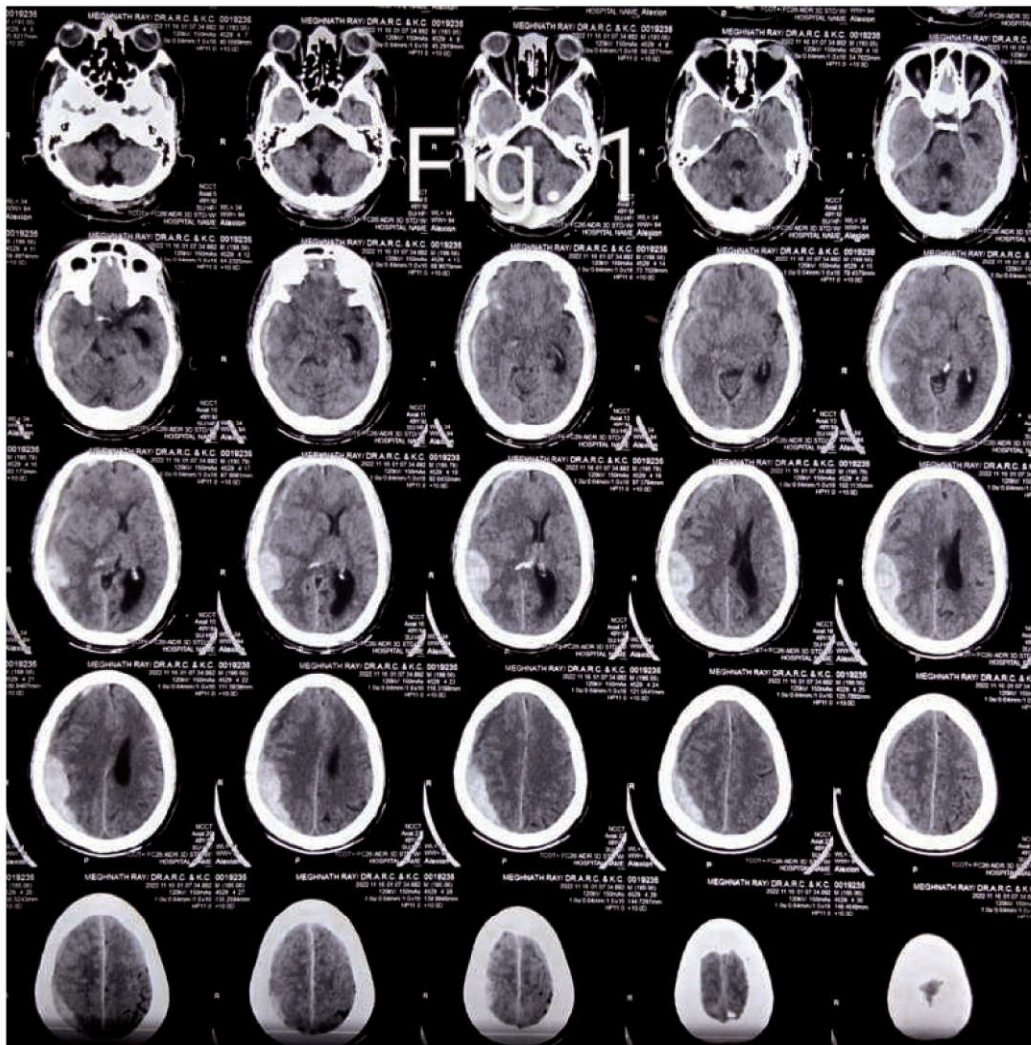


Fig. 2: CT scan after conservative tx.

However his hypertonia and hyperreflexia did not show improvement and there was left sided hemiparesis with power of MRC grade 4, which prompted our neurosurgeon to undertake surgical exploration to evacuate the hematoma with craniectomy on day 5.

Post surgery, the patient's neurological deficits significantly improved in next 5 days and the patient was able to sit up, stand and walk without any support. At the time of discharge, his platelet count was 1,24,000, total leukocyte count 6,800, Hb 9.6gm%, PCV 29%, serum protein 6.6 gm% with albumin 3.8. Serum bilirubin was normal. He was neurologically and hemodynamically stable.

## DISCUSSION

Dengue hemorrhagic fever is a potentially serious complication of dengue virus infection, though intracranial hemorrhage is a rare manifestation.<sup>1</sup> Bilateral thalamic hemorrhage with 'double doughnut' sign in MRI brain is a distinct feature of dengue virus encephalitis.<sup>2</sup>

It's very rare to find extraaxial hemorrhage in such patients.

Though subdural and intraparenchymal brain hemorrhage have been infrequently reported in dengue hemorrhagic fever, occurrence of spontaneous extradural plus subdural hemorrhage



is not yet reported in literature. Only 1 case of spinal extradural hemorrhage has been reported in severe dengue.<sup>3</sup>

Our patient had dengue hemorrhagic fever with right sided subdural and extradural hemorrhage supported by CT comma sign in imaging.<sup>4</sup> He

had hypoalbuminemia with chink of pericardial effusion indicating early capillary leakage.

This patient underwent surgical evacuation of SDH plus EDH at the same time with right fronto-temporo-parietal craniectomy (Fig. 3). His recovery was complete pending cranioplasty on a later date.

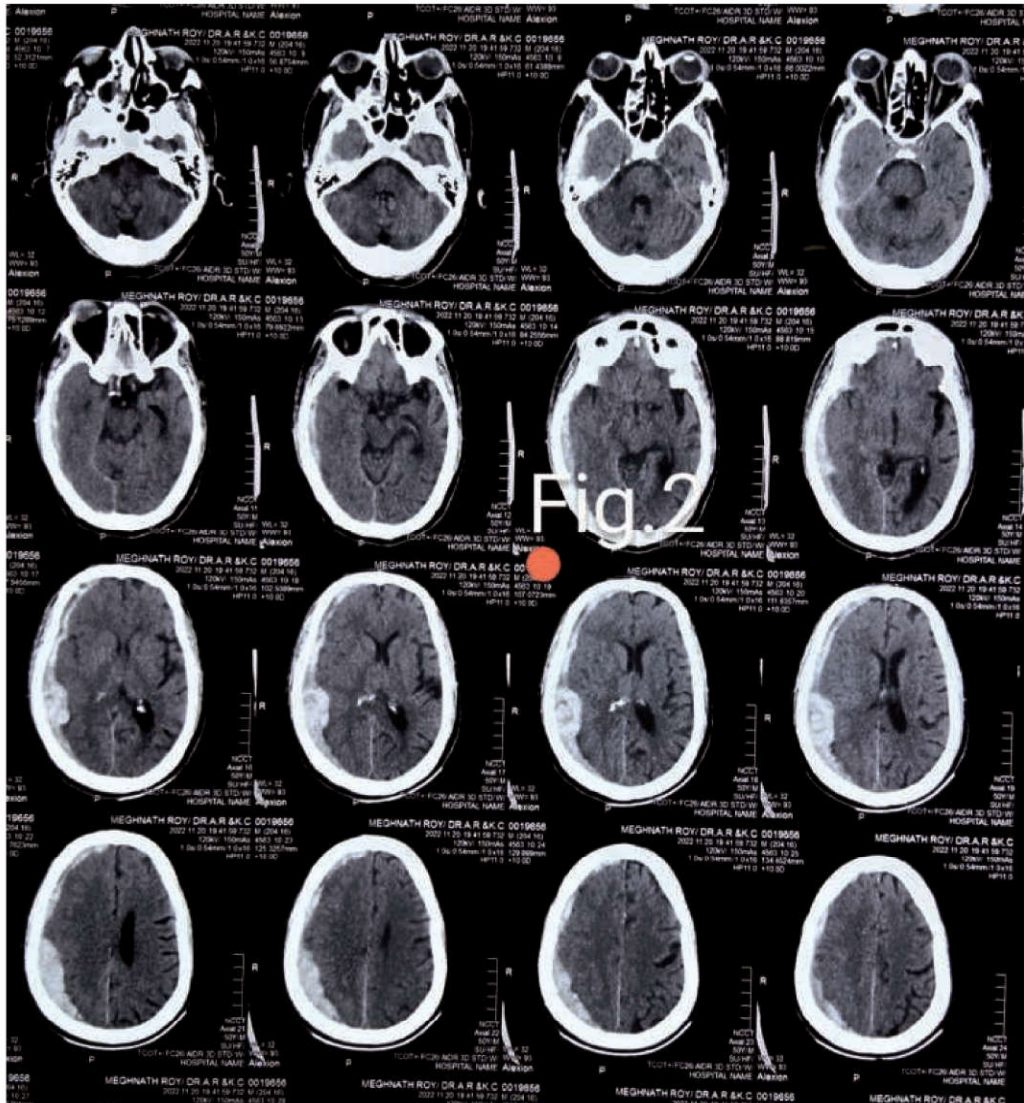


Fig. 3: CT scan after surgery.

## CONCLUSION

Dengue hemorrhagic fever may on occasion present with spontaneous extra-axial intracranial bleed in the form of epidural and subdural hematoma needing rapid corrections of anemia and thrombocytopenia and surgical evacuation for decompression in those with significant neurological deficit.

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