

# A Case Report on Dengue Fever Complicated with Thrombotic Thrombocytopenic Purpura

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**Abstract:** *Thrombotic thrombocytopenic purpura (TTP) is a rare disorder with an incidence of 4–5 cases per million per year. It has significant morbidity and mortality if left untreated. Timely diagnosis and availability of effective treatment such as plasma exchange therapy have reduced the morbidity and mortality significantly. Usually, it is idiopathic or Autoimmune, but several predisposing factors have been Described to cause secondary TTP. In this case report, we discussed a very rare presentation of TTP secondary to dengue Virus infection and how the timely diagnosis along with the immediate institution of appropriate management helped us to cure the patient.*

**Keywords:** Dengue Plasmapheresis, Hemodialysis, Renal Failure, Schistocytes

## 1. Introduction

Thrombotic thrombocytopenic purpura (TTP) is a rare disorder with an incidence of 4–5 cases per million per year. It has significant morbidity and mortality if left untreated. Timely diagnosis and availability of effective treatment such as plasma exchange therapy have reduced the morbidity and mortality significantly. Usually, it is idiopathic or autoimmune, but several predisposing factors have been described to cause secondary TTP. In this case report, we discussed a very rare presentation of TTP secondary to dengue virus infection and how the timely diagnosis along with the immediate institution of appropriate management helped us to cure the patient.

### Clinical Features

The disease consists of the following pentad:

- 1) Microangiopathic hemolytic anemia
- 2) Thrombocytopenic purpura
- 3) Neurologic disturbances
- 4) Fever
- 5) Renal Failure

To initiate plasma exchange therapy or not can be calculated using PLASMIC score which helps distinguish TTP from other causes of thrombotic microangiopathy. It consists of: platelet counts ( $\leq 30,000$ ), hemolysis, active cancer, MCV  $<90$ fL, INR  $<1.5$ , Creatinine  $<2$  mg/dl, and history of hematopoietic stem cell transplant.

## 2. Case Report

A 16 - year - old male with no other comorbidities was admitted to the hospital with complaints of fever over 1 week and one episode of convulsion on that day. His investigations had revealed a low platelet count, high serum

creatinine and dengue NS1 positive. He was symptomatically treated at a local hospital and was shifted to our tertiary care center.

On arrival, the patient was in post - ictal state, i. e., drowsy and arousable to verbal commands.

Hematological investigations were showing anemia, thrombocytopenia, and increased lactate dehydrogenase (LDH) level.

His peripheral blood smear revealed numerous schistocytes; biochemical tests for urine routine micro were suggestive of 3+ blood and albumin in urine and MRI Brain Plain was suggestive of Acute Disseminated Encephalomyelitis.

On catheterization of the patient, urobag showed blood - red colour of urine (Picture 1).

PLASMIC Score on admission was 6.

With this clinical picture and laboratory findings, he was diagnosed as a case of TTP and was advised urgent plasma exchange therapy and urgent hemodialysis. Although there is no firm recommendation for administration of steroids in TTP, we started him on oral Prednisolone (1mg/kg/day). Plasmapheresis was done daily with approximately 2–2.5 L plasma exchange with 5units of Fresh Frozen Plasma.

Hemodialysis was done on alternate days with appropriate blood products.

His general condition started improving from 5th day of hospital stay; although platelets started to drop after cessation of plasma exchange after 5 cycles.

Thus, plasmapheresis was re - started and continued till platelets reached above 1 lac. (Table 1)

A total of 9 cycles of Plasmapheresis and 8 cycles of Hemodialysis were done.



Picture 1

### 3. Result

The patient had dengue viral infection confirmed by serology which was complicated by TTP during the acute phase of dengue viral infection. We diagnosed this by clinical features and ruling out other differential diagnosis by laboratorial and radiological tests. The patient responded well to the plasma exchange therapy and hemodialysis with complete recovery from symptoms

Table 1

	Day 1	Day 4	Day 5	Day 8	Day 14	Day 16	Day 18	Day 22	Day 26
Hb (g/dl)	8.7	7.7	9.2	9.4	9.7	8.8	10.1	7.4	8.2
WBC	11970	7280	13500	11830	9960	9090	43500	13510	21180
PLTS	65000	1.8L	3.97L	2.5L	1.05L	84000	28000	68000	1.4L
CREATININE (mg/dl)	16.4	11.9	12.01	7.58	6.17	4.8	3.39	2.01	1.39
LDH (U/L)	5153	1995	1332		697				451
SCHISTOCYTES	16%						3%		2%

### 4. Discussion

Dengue is most rapidly spreading mosquito - borne viral disease in the world. There is a global pandemic with worldwide distribution. This infection has potential to cause significant morbidity and mortality. Usually, it presents as mild/asymptomatic type of infection; however, at times, it may manifest in more severe forms such as dengue hemorrhagic fever, or dengue shock syndrome. Many unusual complications have been observed with dengue viral infection such as hepatic damage, cardiomyopathy, and encephalopathy. The presence of TTP with dengue viral infection is very rare presentation and has been reported in very few case reports. TTP itself is a rare clinical syndrome characterized by fever, microangiopathic hemolytic anemia, thrombocytopenia, central nervous system involvement, and renal impairment.

However, all five features are observed in only 40% of patients. Secondary TTP can occur after infections, medications (e. g., clopidogrel, cyclosporine), autoimmune diseases, malignancies, pregnancy, and bone marrow transplantation. Infections known to cause thrombotic microangiopathy include hepatitis C, parvovirus B19 virus infection, HIV infection as well as patient with dental foci or streptococci infection. Pathophysiology of TTP includes deficiency of protease enzyme (ADAMTS13) that cleaves von Willebrand factor (vWF) in small segments. In the absence of ADAMTS13 enzyme, large vWF cause platelet aggregation and fibrin deposition in small vessels and result in microthrombi. In our case, the patient was diagnosed as having dengue viral infection by the presence of NS1 antigen and treated accordingly with fluid resuscitation and platelet transfusion. But later, the patient showed features such as fever, thrombocytopenia, hemolytic anemia, and neurological involvement in the form of seizures (CT brain - normal). All these features were suggestive of TTP and patient responded well to plasma exchange therapy,

hemodialysis and, steroid therapy.

### 5. Conclusion

Although the exact incidence of TTP in dengue viral infection is not known, such cases are reported in the recent past. Hence, special attention must be given to dengue virus infection patients presenting with signs and symptoms of TTP in the future. The prompt clinical recognition of such complication and early initiation of specific therapy with plasma exchange is likely to improve the patient's outcome.