

## CASE REPORT

# A Nearly Fatal Case of Expanded Dengue Syndrome in an Infant: Complex Challenges of Severe Hemorrhage, DIC and Multi-Organ Involvement

PETRA GUSTI PARIKESIT, DEVIE KRISTIANI, BARLAAM BAGUS PURWAKA, ANANDA DIGDOYO

Pak Pediatr J 2026; 50(1): 73-78

### ABSTRACT

A 1-year-old infant with Expanded Dengue Syndrome (EDS) — a severe dengue complication marked by multi-organ dysfunction — exhibited fever, vomiting, diarrhea, petechiae, palpebral edema, and cold extremities, progressing to disseminated intravascular coagulation (DIC), hepatic failure, and severe anemia. Laboratory findings confirmed thrombocytopenia, coagulopathy and acute liver injury. Management involved intensive resuscitation with crystalloids, colloids, packed red blood cells, fresh frozen plasma, and platelet transfusions, alongside vitamin K administration. Despite hemodynamic instability and severe bleeding, timely interventions enabled recovery.

Uncommon manifestations like palpebral edema and limb discoloration expanded the recognized EDS spectrum. This case underscores the critical need for early recognition of atypical symptoms, aggressive fluid optimization, and prompt transfusion strategies in endemic regions. Enhanced clinician awareness of EDS's diverse presentations is vital to improving outcomes in pediatric dengue, where rapid deterioration necessitates vigilant monitoring and multidisciplinary care.

**Key Words:** *Expanded dengue syndrome, Disseminated intravascular coagulation, Dengue hemorrhagic fever, Anemia, Massive Hemorrhage*

#### Correspondence to:

**Dr. Petra Gusti Parikesit,**  
Faculty of Medicine, Duta Wacana  
Christian University, Yogyakarta,  
Indonesia, 55224

**E-mail:** petragusti148@gmail.com

Received for publication: Sept. 16, 2025  
Accepted for publication: 19 Nov. 2025

**How to cite this:** Parikesit PG, Kristiani D, Purwaka BB, Digdoyo A. A Nearly Fatal Case of Expanded Dengue Syndrome in an Infant: Complex Challenges of Severe Hemorrhage, DIC and Multi-Organ Involvement

**DOI:**  
<https://doi.org/10.66347/ppj.v50i1.574>

### INTRODUCTION

Dengue fever belongs to the Flaviviridae family which is transmitted by the *Aedes aegypti* mosquito which appears with classic symptoms such as fever, headache, muscle or bone pain, pain behind the eyes, and petechiae. According to the World Health Organization (WHO), more than five million dengue fever cases were reported across over 80 countries in 2023, with the majority occurring in tropical and subtropical areas.<sup>1</sup> Expanded Dengue Syndrome (EDS) is an unusual

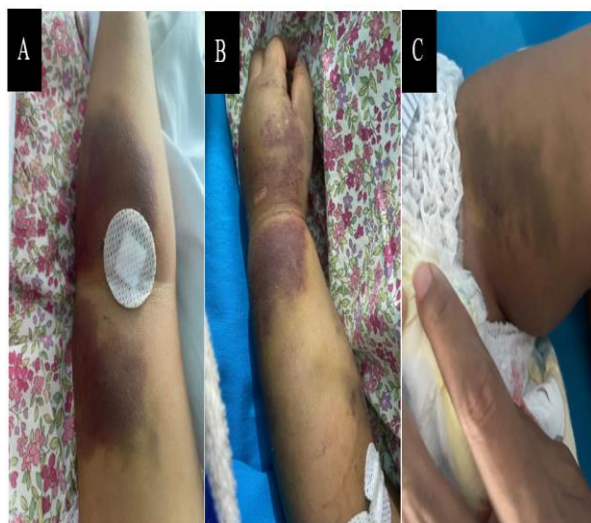
severe complication in patients with severe organ involvement including neurological disorder, heart, kidney, gastrointestinal involvement, as well as the presence of prolonged shock complications.<sup>2</sup> However, some children with EDS may present without symptoms.<sup>3</sup>

Early detection and appropriate management are crucial in reducing the mortality rate of EDS in children. This report aims to describe the clinical presentation, disease progression, and management of a case of EDS and Disseminated

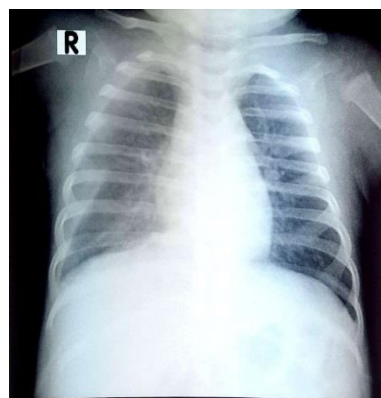
Intravascular Coagulation (DIC) in an infant. The case study is expected to provide insights into the diagnostic and therapeutic challenges associated with this rare condition.

### CASE REPORT

A 1-year-old female infant residing in a community with elevated dengue incidence was referred to the hospital due to a primary complaint of decreased consciousness. Alloanamnesis indicated that five days prior to admission, the patient experienced a high fever, vomiting, and reduced appetite. One day prior to hospital referral, the patient exhibited fluctuating fever. Upon admission, the patient exhibited diminished consciousness, experienced vomiting more than five times, and had liquid bowel movements without blood or mucus occurring four times. Both eyes have been swollen for two days, making it difficult to open them. Physical examination revealed a decreased Glasgow Coma Scale (GCS), palpebral edema, diminished right lung vesicular sounds, abdominal distension, cold extremities, and multiple petechiae. Additionally, swelling was observed in both upper and lower extremities, primarily attributed to blood collection and intravenous fluid delivery (IVFD) insertion (**fig. 1**). Antero-posterior chest X-ray examination demonstrated a right pleural effusion (**fig. 2**).



**Fig 1: Extensive bluish and oedem on upper extremity (A,B) and lower extremity (C)**



**Fig 2: Chest X-ray showing a visible pleural line indicates a right pleural effusion**

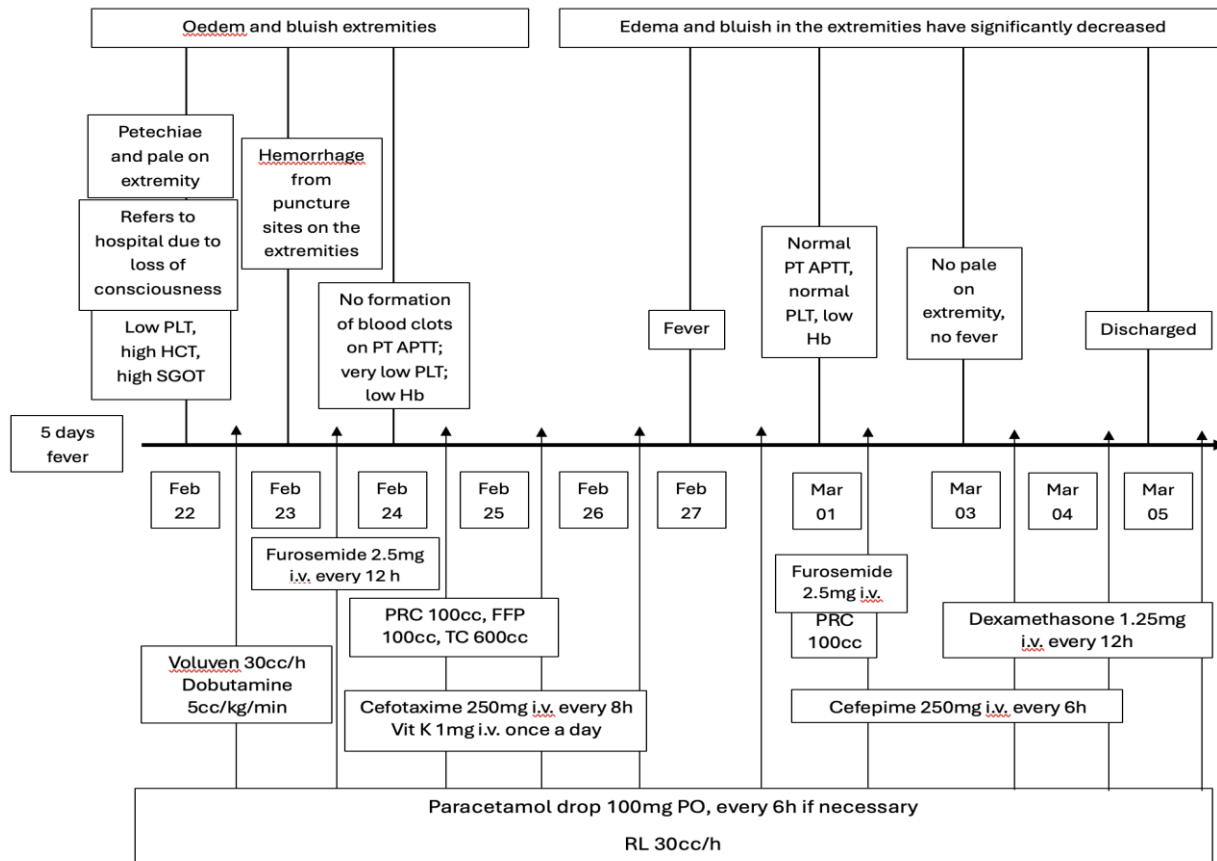
The patient underwent a comprehensive blood test, revealing hemoglobin levels within normal limits, a hematocrit of 37.2%, low platelet count ( $40 \times 10^3/\text{dL}$ ), low mean corpuscular volume (MCV) at 73.2 fL, low mean corpuscular hemoglobin (MCH) at 24 fL, elevated lymphocyte percentage (71%), reduced neutrophil segments (21%), and increased serum glutamate oxaloacetate transaminase (SGOT) at 298.2 U/L, with a positive test of anti-dengue IgM. The patient received voluven therapy at a rate of 30 cc/hour, dobutamine at 5 mcg/kg/minute for one day, followed by a lactated Ringer's infusion at 30 cc/hour and furosemide injections of 2 x 2.5 mg.

On the subsequent day, the patient underwent a routine blood draw for activated thromboplastin time (aPTT) and hematocrit (HCT) evaluations. Following the venipuncture, the patient developed progressive swelling and ecchymosis of the affected limb, accompanied by persistent bleeding at the puncture site. Among the three examinations conducted that day, the lowest hematocrit value recorded was 20.2%, accompanied by a minimum platelet count of  $41 \times 10^3/\text{dL}$ . Additionally, the hemoglobin level was low at 7.1 g/dL, and the PT/APTT examination indicated the absence of blood clot formation. The patient subsequently received 2 bags of TC transfusion, 100 cc of FFP transfusion, and 100 cc of PRC transfusion, along with 3 doses of 250 mg cefotaxime over 3 days. The diagnosis was expanded dengue syndrome accompanied by DIC, hepatic failure,

and severe anemia resulting from bleeding. Subsequent evaluations of PT and APTT yielded favorable results consistent with the control parameters. The hemorrhage and ecchymosis had begun to diminish.

The patient was also given a 1x1 mg vit K injection for 3 days and a 100 cc PRC transfusion. After that, the child was no longer pale, pulmonary vesicular sounds began to be

heard loudly, ascites disappeared, hematoma and ecchymosis had improved, and no longer bleeding from the puncture site. However, the child's temperature had risen to 38C, so paracetamol 4x1ml and cefixime 2x2.5 ml were given. As the day progressed, the fever started to decrease, bleeding stopped, swelling reduced and the child was discharged with improved condition. Figure 3 illustrates the chronology of the patient's disease progression and treatment.



**Fig 3: Timeline of the case presentation description**

## DISCUSSION

This report presents a case of expanded dengue syndrome (EDS) characterized by liver damage and disseminated intravascular coagulation (DIC) in a pediatric patient under 2 years of age. EDS is a term established by the WHO in 2011, referring to atypical manifestations of dengue fever that result in significant impairment of the liver,

kidneys, bone marrow, heart, or brain. Out of the four serotypes of dengue virus, the one most commonly associated with severe cases in primary infections is DENV-3, which originates in Southeast Asia.<sup>4</sup> Liver involvement is frequently observed in dengue infection, though it is typically mild in nature. Liver involvement is generally mild in most instances; however, acute liver failure can occur, leading to significant morbidity and

mortality from complications including encephalopathy, severe bleeding, renal failure, and metabolic acidosis. Possible pathogenesis may include a direct effect of the virus causing necrosis and apoptosis of hepatocytes, host immune response on liver cells and associated high levels of Interleukin-17 and Interleukin-10.<sup>5</sup> Unfortunately, there is no measurement device that can quantitatively measure interleukin levels in our hospital. Consequently, we suggest that in this instance, hepatic injury is predominantly attributable to immune-mediated damage or direct necrosis induced by the dengue virus DENV-3.

Complex alterations to all three phases of hemostasis — coagulation, fibrinolysis, and the primary phase — are the consequence of liver disease. The liver is crucial for hemostasis, manufacturing all clotting factors except von Willebrand factor (VWF), natural anticoagulants, and several fibrinolytic proteins.<sup>6</sup> In this patient, there may be severe liver damage that manifests as coagulopathy, with PT and APTT not forming at all, and low platelet counts. Disseminated Intravascular Coagulation (DIC) is a state of widespread hypercoagulation that can cause microvascular and macrovascular clotting, impaired blood flow, and multiple organ dysfunction syndromes, and is often accompanied by elevated levels of coagulation factor indicators, which may reflect diminished hepatic synthesis capacity. Toxin absorption into the systemic circulation results in prolonged inflammation that activates platelets and induces excessive coagulation, coupled with diminished synthesis and heightened degradation of these factors and their inhibitors, ultimately leading to consumptive coagulopathy and an increased propensity for bleeding.<sup>7,8</sup> The conjunction of thrombocytopenia and diminished coagulation factor levels might be regarded as a hypocoagulable condition, correlating with an elevated risk of hemorrhage, perhaps presenting as anemia in this case.<sup>9</sup>

Colloidal treatments theoretically provide benefits for people experiencing refractory shock with heightened vascular permeability. Nonetheless, the majority of dose-dependent colloidal solutions exhibit detrimental effects on hemostasis. This is linked to a heightened risk of coagulopathy and must be taken into account in

patients with dengue fever. Impaired fibrin polymerization has been recognized as the primary factor contributing to hemostatic dysfunction after the administration of colloidal solutions, particularly Hydroxyethyl Starch. WHO has recommended crystalloid fluids, such as lactated ringers (RL), acetic ringers (RA), and normal saline 0.9% (NS 0.9%) over colloidal fluids for the management of dengue fever among infants with warning signs. NS 0.9% may be utilized for first resuscitation in individuals with or without hyponatremia and with normal chloride concentrations (95-105 mmol/L). If the patient presents with hyperchloremia, hyperchloremic acidosis, or hypernatremia, Ringer's lactate is the preferable option<sup>17</sup>.

Colloidal treatments may theoretically benefit individuals with refractory shock and increased vascular permeability; however, most dose-dependent colloidal solutions adversely affect hemostasis and increase the risk of coagulopathy, which is particularly concerning in patients with dengue fever. Impaired fibrin polymerization — especially after the administration of Hydroxyethyl Starch—has been identified as a key contributor to this hemostatic dysfunction.<sup>10</sup> In response, the WHO recommends crystalloid fluids such as lactated Ringer's (RL), acetic Ringer's (RA), or normal saline 0.9% (NS 0.9%) for managing dengue fever in infants with warning signs, with fluid selection guided by electrolyte status, particularly chloride and sodium levels.<sup>11</sup> In our patient, the initial use of colloids in the form of voluven (6% hydroxyethyl starch 130/0.4 in 0.9% sodium chloride) was aimed at rapidly achieving adequate intravascular volume as a hope for EDS shock management. After suspicion of coagulopathy in the form of DIC due to signs of massive bleeding, colloidal solutions were replaced by crystalloids in the form of RL as an alternative to resuscitation.

The lifespan of platelets is diminished in DF, and antibodies are produced against the body's own platelets. Even without liver involvement, coagulation disorders can also occur in DF patients, especially when there is liver involvement, as in our case shown by the elevated SGOT enzymes.<sup>12</sup> The predominant form of bleeding in dengue is undetectable blood

loss, which may present as anemia, as observed in our case. At present, there is inadequate evidence to establish the efficacy of platelet transfusion in dengue patients experiencing bleeding.<sup>13</sup> Most practitioners will administer platelet transfusion in cases of severe acute mucosal bleeding, as demonstrated in this instance. With the abnormal blood coagulation test, this patient was given Fresh frozen plasma and vitamin K injection. Fresh frozen plasma enhances coagulopathy by replenishing plasma proteins in patients with deficiencies or defects. Concurrently, vitamin K facilitates the synthesis of prothrombin, factor VII, factor IX, and factor X, thereby contributing to the improvement of coagulopathy.<sup>14,15</sup> Furosemide is administered in cases to suppress edema, and as a premedication for blood transfusion to reduce the burden on the infant's heart.

**Source of funding:** None  
**Conflict of interest:** None

#### Authors' affiliation

**Dr. Petra Gusti Parikesit,**  
Faculty of Medicine,  
Duta Wacana Christian University – Yogyakarta,  
Indonesia

**Dr. Devie Kristiani,**  
Department of Pediatrics,  
Bethesda Hospital – Yogyakarta, Indonesia

**Dr. Barlaam Bagus Purwaka,**  
Faculty of Medicine,  
Duta Wacana Christian University – Yogyakarta,  
Indonesia

**Dr. Ananda Digdoyo**  
Faculty of Medicine,  
Duta Wacana Christian University – Yogyakarta,  
Indonesia

#### REFERENCES

- Schaefer TJ, Panda PK, Wolford RW. Dengue Fever. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 [cited 2025 Jun 2]. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK430732/>
- Haryanto B. Indonesia Dengue Fever: Status, Vulnerability, and Challenges. In: Current Topics in Tropical Emerging Diseases and Travel Medicine [Internet]. IntechOpen; 2018 [cited 2025 Jun 2]. Available from: <https://www.intechopen.com/chapters/64497>
- Pourzangiabadi M, Najafi H, Fallah A, Goudarzi A, Pouladi I. Dengue virus: Etiology, epidemiology, pathobiology, and developments in diagnosis and control – A comprehensive review. *Infection, Genetics and Evolution*. 2025 Jan 1;127:105710.
- Suganthan N, Sakthilingham G, Kumanan T. Dengue fever complicated with acute liver failure: A case report of expanded dengue syndrome and literature review. *SAGE Open Med Case Rep*. 2020 Mar 20;8:2050313X20913428.
- Fernando S, Wijewickrama A, Gomes L, Punchihewa CT, Madusanka SDP, Dissanayake H, et al. Patterns and causes of liver involvement in acute dengue infection. *BMC Infect Dis*. 2016 Jul 8;16:319.
- Kujovich JL. Coagulopathy in liver disease: a balancing act. *Hematology Am Soc Hematol Educ Program*. 2015;2015:243–9.
- Gando S, Levi M, Toh CH. Disseminated intravascular coagulation. *Nat Rev Dis Primers*. 2016 Jun 2;2(1):1–16.
- Scarlatescu E, Levy JH, Moore H, Thachil J, Iba T, Roberts LN, et al. Disseminated intravascular coagulation and cirrhotic coagulopathy: overlap and differences. The current state of knowledge. Communication from the SSC of the ISTH. *J Thromb Haemost*. 2025 Mar;23(3):1085–106.
- Levi M. Pathogenesis and diagnosis of disseminated intravascular coagulation. *Int J Lab Hematol*. 2018 May;40 Suppl 1:15–20.
- Gratz J, Zotti O, Pausch A, Wiegele M, Fleischmann E, Gruenberger T, et al. Effect of Goal-Directed Crystalloid versus Colloid Administration on Perioperative Hemostasis in Partial Hepatectomy: A Randomized, Controlled Trial. *J Clin Med*. 2021 Apr 13;10(8):1651.
- World Health Organization. Dengue guidelines for diagnosis, treatment, prevention and control : new edition. 2009 [cited 2025 Jun 2];(WHO/HTM/NTD/DEN/2009.1). Available from: <https://iris.who.int/handle/10665/44188>
- Tayal A, Kabra SK, Lodha R. Management of Dengue: An Updated Review. *Indian J Pediatr*. 2023;90(2):168–77.
- Kularatne SAM, Dalugama C, Rajapakse M, Warnasooriya S, Pathirage M, Ralapanawa U, et al. Blood transfusion in severe dengue infection: a case series. *Journal of Medical Case Reports*. 2023 Jan 18;17(1):17.
- Khawar H, Patel P, Stevens JB, Guzman N. Fresh Frozen Plasma (FFP). In: StatPearls

[Internet]. Treasure Island (FL): StatPearls Publishing; 2025 [cited 2025 Jun 2]. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK513347/>

StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 [cited 2025 Jun 2]. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK551578/>

15. Imbrescia K, Moszczynski Z. Vitamin K. In:
- 

#### Authors' contribution

**PGP:** Proposed topic, data collection and processing, literature search, basic study design, writing of the original draft, read and approving the final manuscript.

**DK:** Medical practices, data collection and processing writing and made corrections to the article, read and approving the final manuscript.

**BBP:** Data collection and processing rewriting and editing the manuscript, read and approving the final manuscript.

**AD:** Data collection and processing rewriting and editing the manuscript, read and approving the final manuscript.

*All the authors have approved the final manuscript draft and accept the responsibility of research integrity.*