



# Non-traumatic Splenic Rupture in Dengue-positive Patient: A Case Report

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## Authors' contributions

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

## Article Information

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Case Report

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## ABSTRACT

**Background:** Non-traumatic splenic rupture is a dramatic abdominal emergency that requires immediate diagnosis and surgical treatment for patient survival. We report a case of non-traumatic splenic injury in a 23 years male who presented with fever and tested positive for NS-1 (Dengue). USG showed increased spleen size right to minimal pleural effusion. Fluid is present in the peri-splenic and pelvic regions.

CECT Abdomen shows mild hepatosplenomegaly increasing non-enhancing areas in the spleen. Ruptured spleen. Diffuse mesenteric fat stranding with fluid along the mesenteric sleeves of edematous bowel loops. ascites in the pelvis and mesenteric sleeves of bowel loops with increased attenuation/S/O peritonitis.

**HPE:** Spleen with features of infarction gallbladder chronic acalculous cholecystitis.

**Conclusion:** Non-traumatic splenic rupture is a rare entity that needs a high index of suspicion for diagnosis in a case of dengue fever.

*Keywords: Splenic rupture; dengue fever; splenectomy; cholecystectomy; pigtail catheterization.*

## DEFINITIONS

*CECT* : Contrast Enhanced Computed Tomography

*HPE* : Histo-Pathological Examination

*NSR* : Non-traumatic Splenic Rupture

## 1. INTRODUCTION

Dengue virus is an arbovirus classifiable in the *Flaviviridae* family. Dengue Fever is caused by all four serotypes of dengue virus carried by the vector *Aedes aegypti* and rarely by *Aedes albopictus*. It was classified as dengue without warning signs, dengue with warning signs, and severe dengue (SD) by World Health Organization (WHO) in 2009 [1]. This infection can lead to several complications, such as gastrointestinal or acute abdomen [2]. Symptoms of infection vary from asymptomatic, mild febrile dengue fever (DF) to severe disease with plasma leakage as dengue hemorrhagic fever (DHF). Spontaneous splenic rupture, a rare condition in dengue infection was endured in the present case. The mechanism underpinning acute abdomen formation is still unclear, but it is believed to be due to the depletion of coagulation factors and platelets, leading to intra-splenic hemorrhage and its consequent rupture [3].

Mostly, severe cases may present with peritoneal findings, Kehr's sign, or signs of shock [4]. Due to its low incidence, non-specific presentation, and lack of trauma history, ASR is easily misdiagnosed for other more common causes of LUQ abdominal pain such as diverticulitis, pancreatitis, and nephrolithiasis [5]. Delay in diagnosis may lead to death [6].

## 2. CASE REPORT

A 23 years old male patient complained of intermittent high-grade fever for three days, associated with vomiting, generalized weakness, and headache. The patient is a known alcoholic and pan-chewer. On examination, a petechial rash was present over bilateral upper limbs (flexor aspect) and upper back, and yellow discoloration of the sclera. R/S Normal vesicular breath sounds were heard. P/A soft tenderness present per umbilical area. Vitals stable with raised temperature. Blood investigations showed a platelet count of 16,000-18,000/cu mm and elevated liver function test with total bilirubin 4.4. The serological test showed positive for NS1 antigen. Lower titers (1:40) for the Widal test, ruled negative for

Typhoid. The patient was transfused with six platelet concentrations and two packed red blood cells. On the fifth day of admission, the patient developed distention of the abdomen and decreased breath sounds on the right lower lobe. USG showed increased spleen size and right-sided minimal pleural effusion. Fluid is present in the peri-splenic and pelvic regions. On the 14th day of admission patient developed tachycardia, tachypnea, hypotension, and rebound tenderness in the lower abdomen. Guarding and rigidity were present. R/S decreased breath sounds. right basal > left basal. Total bilirubin levels were further elevated. The patient developed anemia. CECT Abdomen shows mild hepatosplenomegaly, increasing non-enhancing areas in the spleen. Ruptured spleen (Fig. 1). No evidence of Portosystemic collaterals was observed. Normal liver echo texture, portal vein caliber, and flow velocities were observed (Fig. 5). Dengue fever with hemolytic jaundice with hepatitis and peritonitis. Emergency exploratory laparotomy (Fig. 2) was done with the spleen and gall bladder removal. Peritoneal lavage was done with 3 liters of NS.

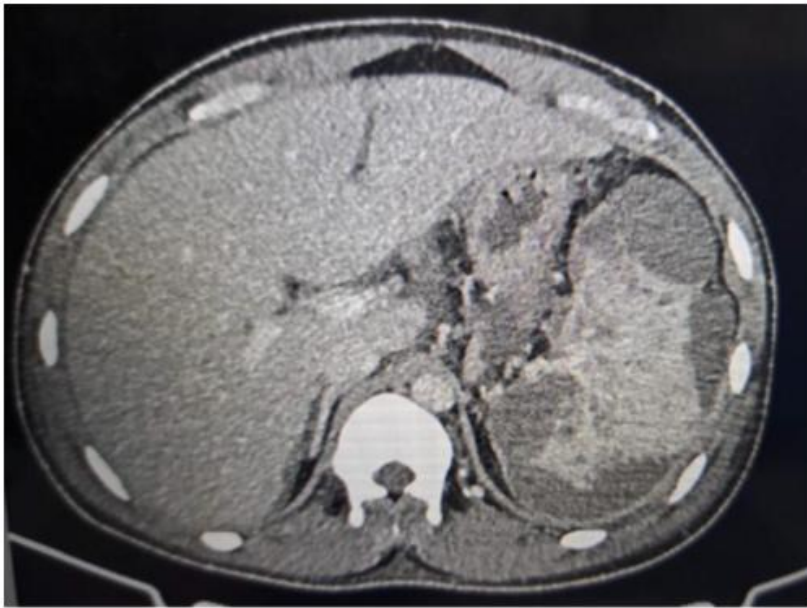
Intraoperative findings had the presence of 1 liter of bilious ascites and 500ml of pus in between the spleen and peritoneal wall. The gall bladder was turgid edematous acalculous cholecystitis (Fig. 3). Drain was placed in the pelvic and left hypochondria region. Pus and ascitic fluid were sent for culture sensitivity. Gall bladder and spleen were sent for HPE. The patient was kept under IV antibiotics, and vaccinations were given (Pneumococcal, H influenzae, Meningococcal). Pus culture and sensitivity test isolated *Escherichia coli*. A review ultrasound showed a peri-splenic fossa collection of about 150ml which was drained with pigtail catheterization. The pigtail catheter was removed after nil drainage. Histopathological examination shows a spleen with features of infarction (Fig. 4), and a gallbladder with chronic acalculous cholecystitis.

## 3. DISCUSSION

Dengue fever is a viral infection. It is primarily complicated in children due to shifting patterns of immunity and infection. Now, it is prevalent among the adult population. The viremic stage of dengue loss from the 2nd to 7th day and is characterized by sudden onset of high fever, headache, rash, generalized weakness, muscle pain, nausea, vomiting, and retroorbital pain. Alarm signs usually arise from the 3rd and 7th days of disease onset, like uncontrolled vomiting, continuous abdominal pain, and painful

hepatomegaly. Severe signs were seen with features of organ dysfunction, shock and severe bleeding. The spleen is often congested in severe dengue, and subcapsular hematomas

are found in 15% of necropsies. However, a splenic rupture in dengue infection is extremely rare, and only a few cases have been reported in the literature.



**Fig. 1. CECT abdomen showing multiple hypodense non-enhancing areas in the spleen predominantly in the upper pole with peri splenic hematoma**



**Fig. 2. Exploratory laparotomy in mid-vertical line incision showing spleen and gall bladder**

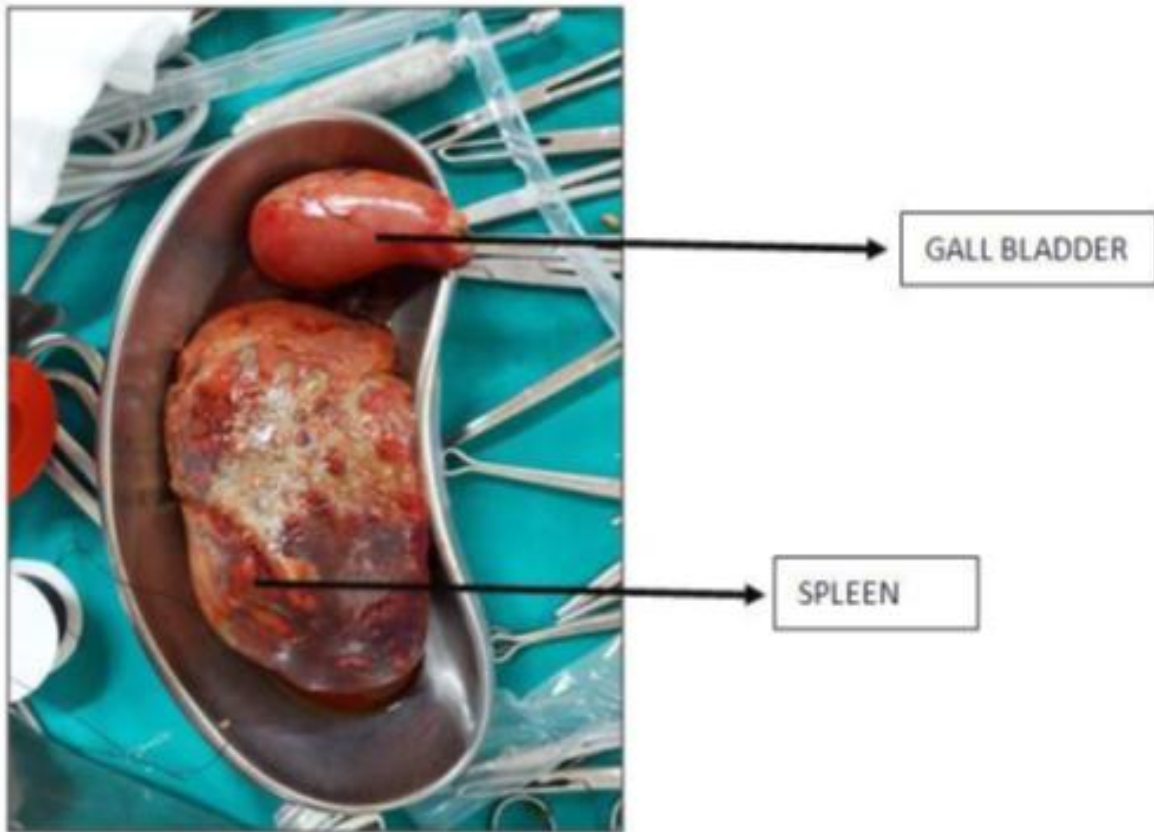


Fig. 3. Showing ruptured spleen with turgid gall bladder

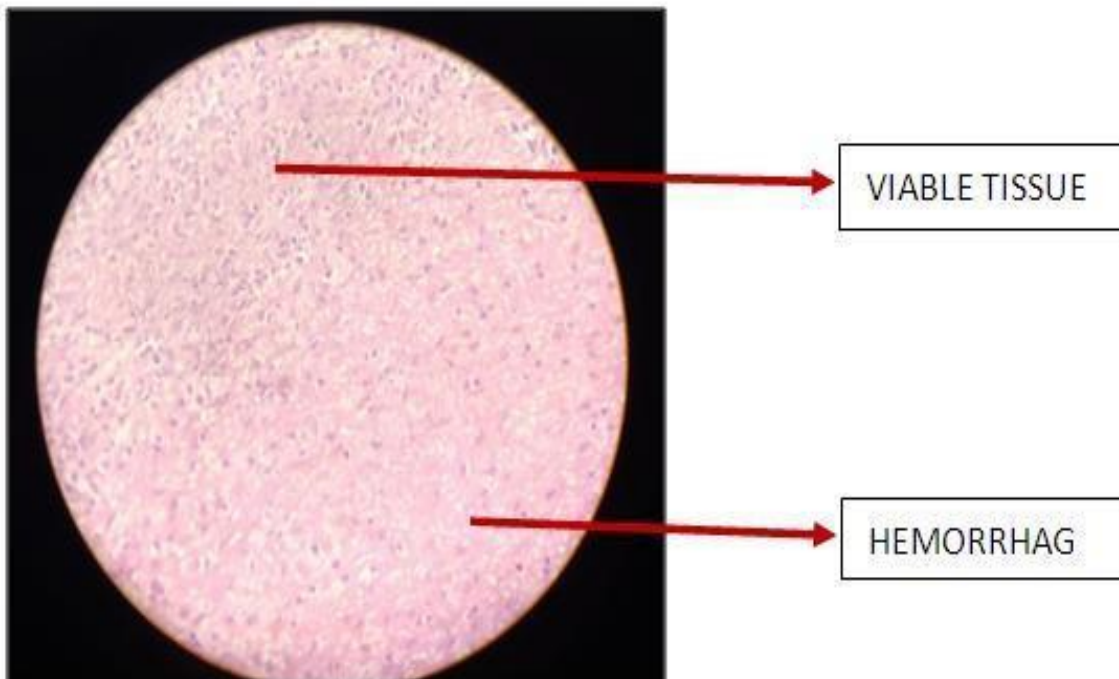
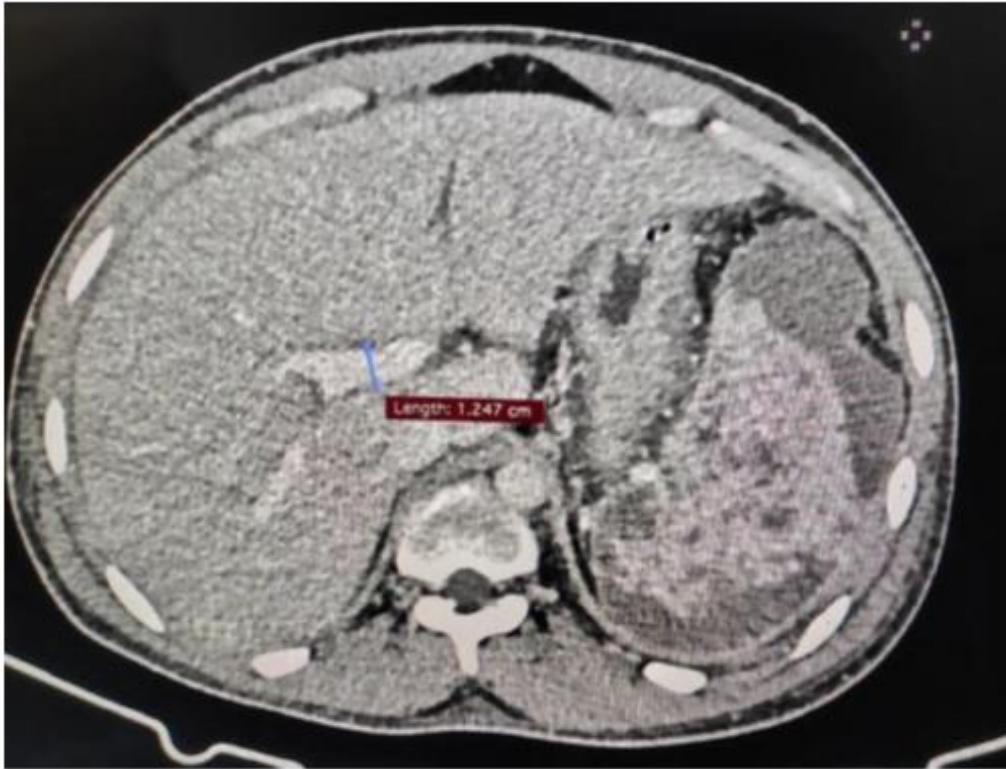


Fig. 4. HPE showing hemorrhagic infarct and viable tissue in 400X





**Fig. 5. CECT showing normal portal vein caliber and liver density. No evidence of thrombus and surface irregularity**

According to Tonolini et al, splenic rupture can be with or without hemoperitoneum and acute abdominal manifestations. Young age patients with acute infection suggest an atraumatic splenic rupture [7]. Non-traumatic splenic rupture (NSR) may result from an infection of connective tissue and malignancies in infections like mononucleosis, malaria, typhoid, endocarditis, aspergillosis, and dengue [8]. NSR can be pathological or spontaneous. Silva et al hypothesized that a combination of coagulation factors and thrombocytopenia contributes to causing splenic rupture [9]. In the majority of cases, splenic rupture occurs in the viremic phase of dengue, that is, before the development of antibodies in the presence of antigen.

In the present case, the diagnosis of spontaneous splenic rupture was ruled out by Orloff and Peksin criteria [10]. The diagnosis was confirmed by means of ultrasonography and CT diagnosis. On the 14th day of admission, an exploratory laparotomy was performed followed by splenectomy and cholecystectomy. Histopathology demonstrated splenic infarction and chronic acalculous cholecystitis. Acute

acalculous cholecystitis is common and well- a known complication of dengue and differential diagnosis for splenic rupture [11].

Management of patients with spontaneous splenic rupture is well debated. Among 136 pathological splenic ruptured, 88 received the surgical intervention. Of this, 55 (63%) survived, and 33 (37%) died. Of which 43 patients had conservative management, 40 died [12]. surgical treatment controls bleeding and also results in the almost immediate resolution of thrombocytopenia, reestablishing hemostasis in about two days. The current recommendation in most cases of dengue infection is still splenectomy.

#### **4. CONCLUSION**

Non-traumatic splenic rupture is a rare entity in dengue fever that need high suspicion for diagnosis. Increased awareness of splenic rupture in dengue fever enhances the early diagnosis in the presence of abdomen pain. Radiological investigations help in the efficient treatment and further decrease morbidity and mortality.

## CONSENT

The written consent form was taken from the patient for publishing this case.

## ETHICAL APPROVAL

As per international standards or university standards are written ethical approval has been collected and preserved by the author(s).

## ACKNOWLEDGEMENT

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## COMPETING INTERESTS

The authors have declared that no competing interests exist.

## REFERENCES

1. WHO Guidelines Approved by the Guidelines Review Committee. Dengue: Guidelines for Diagnosis, Treatment, Prevention and Control: New Edition. Geneva: World Health Organization; 2009.
2. Ungthammakhun C, Chueansuwan W, Changpradub D. Dengue hemorrhagic fever complicated with spontaneous rupture of the spleen among patients with thalassemia and G6PD deficiency: A Case Report. Archives of Clinical and Medical Case Reports. 2021;5:873-877.
3. De Souza LJ, De Azevedo J, Kohler LIA, et al. Evidence of dengue virus replication in a non-traumatic spleen rupture case. Arch Virol. 2017;162:3535-3539. Available:https://doi.org/10.1007/s00705-017-3527-6
4. Instructions for sports medicine patients; 2012. Available:https://www.elsevier.com/books/instructions-for-sports-medicine-patients/safran/978-1-4160-5650-8.
5. Cartwright SL, Knudson MP. Evaluation of acute abdominal pain in adults. Am Fam Physician. 2008;77:971-8.
6. Walker AM, Foley EF. Surgical management of atraumatic splenic rupture. Int Surg J. 2016;3:2280-8.
7. Tonolini M, Ierardi AM, Carrafiello G. Atraumatic splenic rupture, an underrated cause of acute abdomen. Insights Imaging. 2016;7(4):641-6. DOI:10.1007/s13244-016-0500-y Epub 2016 May 18. Erratum in: Insights Imaging. 2016 Aug;7(4):647 PMID:27193528 PMCID: PMC4956628
8. Mukhopadhyay M, Chatterjee N, Maity P, Patar K. Spontaneous splenic rupture: A rare presentation of dengue fever. Indian J Crit Care Med. 2014;18:110-2.
9. Silva W, Gunasekera M. Spontaneous splenic rupture during the recovery phase of dengue fever. BMC Res Notes. 2015; 8(1):286.
10. Orloff MJ, Peskin GW. Spontaneous rupture of the normal spleen; a surgical enigma. Int Abstr Surg. 1958;106:1-11.
11. Gedik E, Girgin S, Aldemir M, Keles C, Tuncer MC, Aktas A. Non-traumatic splenic rupture: Report of seven cases and review of the literature. World J Gastroenterol. 2008;14:6711-6716.
12. Giagounidis AA, Burk M, Meckenstock G, Koch AJ, Schneider W. Pathologic rupture of the spleen in hematologic malignancies: Two additional cases. Ann Hematol. 1996;73:297-302.

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