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CASE REPORT

Spontaneous Splenic Rupture During the Recovery Phase of Severe Dengue Fever: Perioperative Anaesthetic Management of an Emergency Splenectomy

Janson Darrel[1], Panduwawalla P[1], Widanapathirana C N[2], Abiharan P[3], Senavirathna J[3]

[1]Department of Anaesthesia, Colombo South Teaching Hospital, Kalubowila, Sri Lanka.
[2]Dengue Unit, Colombo South Teaching Hospital, Kalubowila, Sri Lanka.
[3]Department of General Surgery, Colombo South Teaching Hospital, Kalubowila, Sri Lanka.

*Corresponding author: Dr. Darrel Janson E-mail: jansonkd@yahoo.com

https://orcid.org/0009-0002-3391-8320

ABSTRACT

Spontaneous splenic rupture is a rare but life-threatening complication of dengue fever and is most commonly reported during the critical phase. We describe an unusual case occurring during the recovery phase in a 35-year-old previously healthy man with severe dengue who initially improved with rising platelet counts before developing sudden left upper quadrant pain, hypotension, tachycardia, and anaemia. Contrast-enhanced computed tomography confirmed splenic rupture with haemoperitoneum, and emergency splenectomy was performed under general anaesthesia. Rotational thromboelastometry-guided transfusion supported targeted blood product therapy. Histopathology confirmed splenic rupture with extensive intraparenchymal haemorrhage and capsular disruption. The patient recovered well and was discharged in a stable condition. This case highlights the need to consider splenic rupture even during the recovery phase of dengue fever and the importance of early diagnosis, prompt surgery, and meticulous perioperative management.

Keywords: Dengue fever, spontaneous splenic rupture, splenectomy, perioperative anaesthesia, rotational thromboelastometry (ROTEM)

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INTRODUCTION

Dengue fever is a major public health problem in Sri Lanka. Although bleeding complications are well recognised, spontaneous splenic rupture is exceptionally rare. Most reported cases occur during the critical phase. This report describes rupture during the recovery phase and highlights the perioperative anaesthetic challenges and multidisciplinary management required for successful treatment.

CASE PRESENTATION

A 35-year-old previously healthy male presented with a 5-day history of high-grade fever, myalgia, headache, anorexia and malaise. Dengue infection was confirmed clinically and serologically, and he was admitted to the Dengue High Dependency Unit of Colombo South Teaching Hospital. Initial management followed institutional dengue guidelines with close haemodynamic monitoring, serial laboratory investigations and fluid management. During the critical phase of illness, he developed thrombocytopenia with a nadir platelet count of 24 × 10^9/L, haemoconcentration and biochemical evidence of dengue hepatitis. His haemodynamic status remained stable, and conservative management was continued. Over the following 48 hours, platelet counts increased to 107 × 10^9/L, haematocrit normalised and clinical assessment suggested resolution of plasma leakage, indicating transition to the recovery phase.

Despite this apparent improvement, the patient suddenly developed severe left upper quadrant abdominal pain associated with diaphoresis, dizziness, restlessness, tachycardia, hypotension and a progressive fall in haemoglobin concentration. Physical examination demonstrated abdominal tenderness with signs of hypovolaemia. Arterial blood gas analysis showed mild respiratory alkalosis without significant metabolic derangement. Bedside ultrasonography revealed free intraperitoneal fluid, and contrast-enhanced computed tomography confirmed spontaneous splenic rupture with a large haemoperitoneum.

Following multidisciplinary discussion involving the dengue physician, general surgeon, anaesthetist and haematologist, the patient was transferred urgently to the operating theatre. Preoperative management included oxygen therapy, fluid resuscitation, invasive monitoring, blood cross-matching and preparation of blood products. General anaesthesia was induced using a modified rapid-sequence induction technique with careful haemodynamic control. Emergency exploratory laparotomy revealed approximately 1400 mL of haemoperitoneum secondary to spontaneous splenic rupture. Splenectomy was successfully performed. Intraoperative rotational thromboelastometry demonstrated preserved coagulation despite thrombocytopenia, enabling targeted transfusion therapy and avoiding unnecessary blood product administration. One unit of packed red blood cells was transfused intraoperatively. Haemodynamic stability was restored following definitive surgical control of haemorrhage.

Histopathological examination demonstrated extensive intraparenchymal haemorrhage with capsular disruption and no evidence of benign or malignant pathology, confirming spontaneous splenic rupture secondary to dengue infection. The patient had an uncomplicated postoperative recovery with gradual normalisation of haemodynamic and laboratory parameters. He was discharged in stable condition after counselling regarding post-splenectomy vaccination, infection prevention, and long-term follow-up.



Figure 1: CT scan demonstrating splenic rupture with haemoperitoneum.

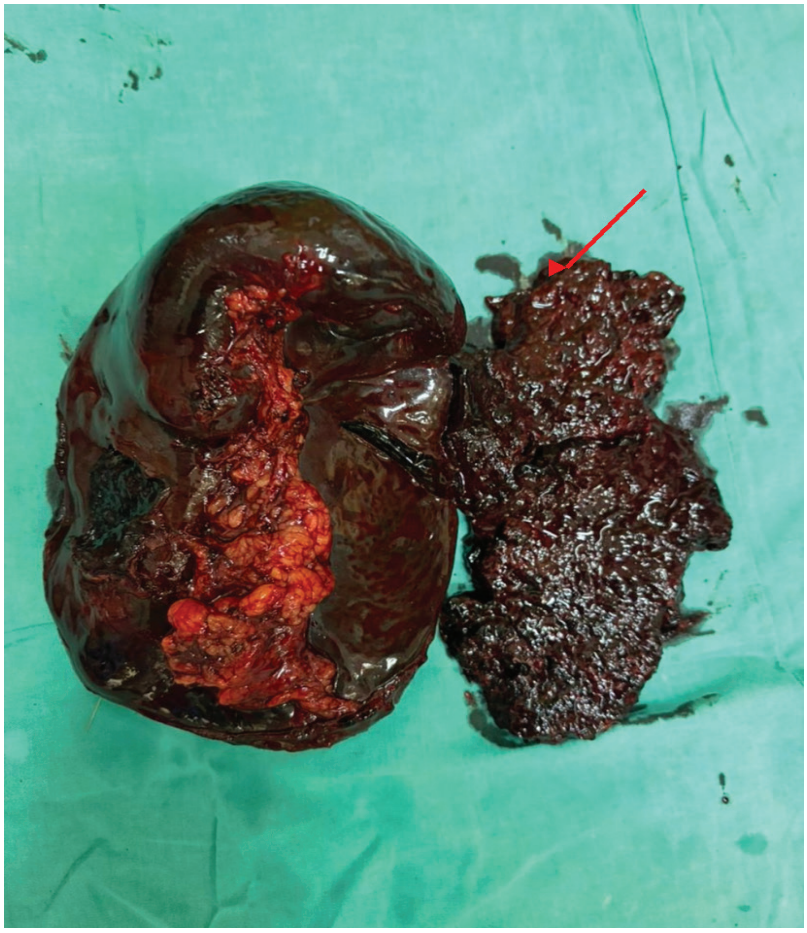
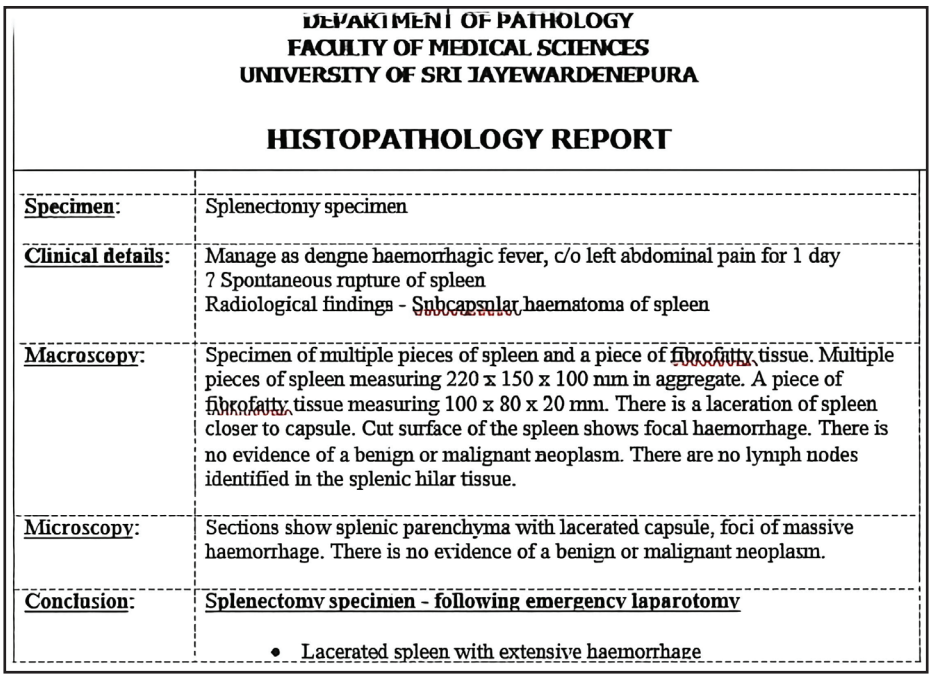


Figure 2: Resected spleen during emergency laparotomy showing lacerated capsule and haemorrhages.



DEPARTMENT OF PATHOLOGY
FACULTY OF MEDICAL SCIENCES
UNIVERSITY OF SRI JAYEWARDENEPURA

HISTOPATHOLOGY REPORT

Specimen:	Splenectomy specimen
Clinical details:	Manage as dengue haemorrhagic fever, c/o left abdominal pain for 1 day ? Spontaneous rupture of spleen Radiological findings - Subcapsular haematoma of spleen
Macroscopy:	Specimen of multiple pieces of spleen and a piece of fibrofatty tissue. Multiple pieces of spleen measuring 220 x 150 x 100 mm in aggregate. A piece of fibrofatty tissue measuring 100 x 80 x 20 mm. There is a laceration of spleen closer to capsule. Cut surface of the spleen shows focal haemorrhage. There is no evidence of a benign or malignant neoplasm. There are no lymph nodes identified in the splenic hilar tissue.
Microscopy:	Sections show splenic parenchyma with lacerated capsule, foci of massive haemorrhage. There is no evidence of a benign or malignant neoplasm.
Conclusion:	Splenectomy specimen - following emergency laparotomy • Lacerated spleen with extensive haemorrhage

Figure 3: Histopathology report showing extensive intraparenchymal haemorrhages.

Table 1: Key findings

Parameter	Findings
Lowest platelet count	24×10^9/L
Highest platelet count before rupture	107×10^9/L
Haemoperitoneum	Approximately 1400 mL
ROTEM	Preserved coagulation
Histology	Capsular disruption with haemorrhages

Table 1: Key Timelines

Day since admission	Event
1	Admission with severe dengue
3	Critical phase
5	Recovery with rising platelets
6	Splenic rupture diagnosed
6	Emergency splenectomy
36	Recovered and discharged

DISCUSSION

Spontaneous splenic rupture is an uncommon but life-threatening complication of dengue fever. Although haemorrhagic manifestations are well recognised in severe dengue, splenic rupture is rarely encountered and may be overlooked because its presentation can mimic dengue shock syndrome or other causes of acute abdomen. Delayed diagnosis may result in catastrophic intra-abdominal haemorrhage and increased mortality.

The most notable feature of this case is that splenic rupture occurred during the recovery phase of dengue infection after apparent clinical improvement, rising platelet counts, and resolution of plasma leakage. Most published cases describe splenic rupture during the critical phase, when thrombocytopenia and capillary leak are maximal. Our case demonstrates that recovery of platelet counts does not exclude the possibility of severe haemorrhagic complications and that continued clinical vigilance is essential even after apparent recovery.

The exact mechanism of spontaneous splenic rupture in dengue remains uncertain. Proposed mechanisms include splenic congestion caused by immune activation, endothelial dysfunction, thrombocytopenia, coagulopathy, intrasplenic haemorrhage and subcapsular haematoma formation leading to capsular rupture. Histopathological examination in our patient demonstrated extensive intraparenchymal haemorrhage and capsular disruption without evidence of underlying neoplastic or infiltrative disease, supporting dengue infection as the primary pathological process.

From a clinical perspective, persistent abdominal pain, unexplained tachycardia, hypotension, falling haemoglobin or haemodynamic instability in patients with dengue should prompt urgent evaluation for occult intra-abdominal bleeding. Bedside ultrasonography provides rapid assessment in unstable patients, whereas contrast-enhanced computed tomography remains the imaging modality of choice for confirming splenic injury and determining the extent of haemoperitoneum.

The anaesthetic management of emergency splenectomy in severe dengue is particularly challenging because of dynamic intravascular volume changes, thrombocytopenia, potential coagulation abnormalities and the risk of major haemorrhage. Excessive fluid administration may worsen capillary leak and pulmonary oedema, whereas inadequate resuscitation may exacerbate tissue hypoperfusion. Careful haemodynamic monitoring, balanced fluid therapy and timely blood product administration are therefore essential.

A notable aspect of this case was the use of rotational thromboelastometry (ROTEM) to guide intraoperative transfusion. Despite thrombocytopenia, ROTEM demonstrated preserved global coagulation, allowing targeted transfusion therapy and avoiding unnecessary blood product administration. This highlights the value of point-of-care coagulation monitoring in complex emergency surgery, particularly when conventional laboratory tests may not accurately reflect functional haemostasis.

The favourable outcome in this patient was likely attributable to early recognition, rapid multidisciplinary decision-making, timely surgical intervention and coordinated perioperative management involving physicians, surgeons, anaesthetists, intensivists and haematologists. This case emphasises that spontaneous splenic rupture should remain an important differential diagnosis in dengue patients who deteriorate during the recovery phase, even when conventional laboratory parameters appear to be improving.

CONCLUSION

Spontaneous splenic rupture is a rare but potentially fatal complication of severe dengue fever that requires prompt recognition and urgent intervention. This case demonstrates that catastrophic haemorrhagic complications may occur during the recovery phase despite apparent clinical improvement and rising platelet counts. Clinicians should therefore maintain a high index of suspicion in dengue patients who develop acute abdominal pain, haemodynamic instability or an unexplained fall in haemoglobin after the critical phase. Early imaging, rapid multidisciplinary decision-making, timely emergency splenectomy and meticulous perioperative anaesthetic management contributed to the favourable outcome in this patient. Point-of-care coagulation assessment using ROTEM facilitated targeted transfusion therapy and supported optimal perioperative haemostatic management.

AUTHORS' CONTRIBUTIONS

Concept and design: DJ, PP

Literature review: DJ

Compilation of manuscript: DJ

Manuscript editing and proofreading: DJ, PP, CNW, PA, JS

DECLARATION OF CONFLICTS OF INTEREST

The authors declare no potential conflicts of interest relevant to this article.

DECLARATION OF PATIENT'S CONSENT

Written informed consent was obtained from the patient for publication of this case.

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