

Splenic Rupture Following Diagnostic Upper Gastrointestinal Endoscopy: A Rare, Life-Threatening Complication

Haridra Sundarajan¹, Easwaramoorthy Sundaram^{2*}, Naresh Kumar³, Venkatesan Pugazhendhi⁴ and Sakthivel Chandrasekar⁵

¹Postgraduate Resident, Lotus Hospital and Research Centre, Erode, India.

²Head of the Department of Surgery, Lotus Hospital and Research Centre, Erode, India.

³Postgraduate Resident, Lotus Hospital and Research Centre, Erode, India.

⁴Postgraduate Resident, Lotus Hospital and Research Centre, Erode, India.

⁵Consultant surgeon, Lotus Hospital and Research Centre, Erode, India.

*Corresponding author

Prof. Dr Easwaramoorthy Sundaram,

Department of Surgery, Lotus Hospital and Research Centre, Erode, Tamil Nadu, India.

ORCID: <https://orcid.org/0000-0002-1823-7204>

Submitted: 10 Sept 2026; Accepted: 18 Sept 2026; Published: 1 Oct 2026

Citation: Sundarajan, H., Sundaram, E., Kumar, N., Pugazhendhi, V., & Chandrasekar, S. (2026). Splenic Rupture Following Diagnostic Upper Gastrointestinal Endoscopy: A Rare, Life-Threatening Complication. *J Sur & Surgic Proce.*, 4(4):1-4.

DOI : <https://doi.org/10.47485/3069-8154.1036>

Abstract

Background: Splenic rupture is an exceptionally rare, life-threatening complication of diagnostic upper gastrointestinal endoscopy. It is traditionally secondary to direct mechanical traction or sudden spikes in intra-abdominal pressure.

Case Presentation: A 53-year-old male presented with haemorrhagic shock and acute abdomen 24 hours post-endoscopy. The procedure was complicated by persistent, intense retching. Contrast-enhanced computed tomography (CECT) demonstrated a 4.9 cm splenic lower pole laceration, acute hematoma, and gross hemoperitoneum. Following progressive hemodynamic decline and a haemoglobin drop from 9.7 g/dL to 6.7 g/dL, emergency splenectomy was performed. Histopathology unexpectedly confirmed an underlying cavernous hemangioma at the lower pole with capsular rupture.

Conclusions: Surgeons must maintain a high index of suspicion for splenic injury during post-procedural evaluations of acute abdominal pain, particularly following uncooperative patient encounters or when hidden vascular anomalies exist.

Keywords: Splenic Rupture, Upper Gastrointestinal Endoscopy, Iatrogenic Complication, Cavernous Hemangioma, Hemoperitoneum.

Introduction

Splenic rupture is a catastrophic clinical event that demands immediate surgical intervention to prevent exsanguination. While the vast majority of cases stem from blunt or penetrating abdominal trauma, atraumatic or spontaneous splenic rupture is a known entity (Smith & Charles, 2024). This phenomenon typically manifests in the setting of malignant haematological disorders, severe systemic infections, inflammatory processes, or localised vascular pathologies (Estevez-Boullosa et al., 2021).

Iatrogenic splenic injury secondary to endoscopic procedures is a documented, albeit uncommon, hazard within gastroenterology. While it is widely associated with colonoscopy or advanced interventions like endoscopic retrograde cholangiopancreatography (ERCP), splenic rupture following a routine, uncomplicated diagnostic esophagogastroduodenoscopy (EGD) remains extraordinarily rare (Davis & Thapa, 2022).

This case report outlines the presentation, imaging, intraoperative findings, and pathological analysis of an acute splenic rupture following a routine diagnostic EGD. The clinical course was uniquely driven by severe procedural retching and an underlying, previously asymptomatic splenic vascular lesion.

Case Presentation

A 53-year-old male presented to our emergency department during the night, exhibiting advanced features of hemorrhagic shock, including persistent hypotension, cold extremities, and severe tachycardia (>140 beats per minute). The patient described a rapid onset of agonising, diffuse, and continuous abdominal pain that was coupled with a distressing sense of internal abdominal fullness.

The patient's medical timeline revealed that he had undergone a standard outpatient diagnostic EGD approximately 24 hours

prior at an outside facility to investigate chronic gastritis-like symptoms. The external procedural report noted the presence of erosive duodenitis and gastroesophageal reflux disease (GERD). Crucially, the endoscopist documented that the patient was highly uncooperative and experienced recurrent, forceful bouts of retching and gagging throughout the instrumentation phase.

Later that evening, the patient complained of mild abdominal pain, which was managed symptomatically at an urgent care clinic. However, by midnight, his abdominal pain progressed exponentially, accompanied by systemic decompensation, prompting emergency transport to our hospital.

Upon physical examination, the patient was severely distressed and remained completely immobile in bed, as any movement exacerbated his symptoms. The abdomen was rigid, distended, and demonstrated diffuse guarding with severe rebound tenderness across all quadrants. Focused Assessment with Sonography for Trauma (FAST) scan was immediately performed and revealed free intraperitoneal fluid in the peri-splenic and hepatorenal spaces. Laboratory evaluations showed an initial haemoglobin of 9.7 g/dL, which exhibited a rapid, downward trend.

Contrast-enhanced computed tomography (CECT) of the abdomen and pelvis was urgently performed. The imaging revealed that the normal architecture of the spleen was almost entirely replaced by a massive, heterogeneous, and acutely hyperdense subcapsular and intraparenchymal hematoma measuring $15.9 \times 17.6 \times 16.9$ cm. A distinct parenchymal laceration measuring approximately 4.9 cm in length was localised to the lower pole of the spleen, directly contiguous with a well-demarcated underlying vascular lesion and a gross hemoperitoneum.

The patient was transferred to the Intensive Care Unit (ICU) for immediate stabilisation, including volume expansion and targeted resuscitation with packed red blood cells (PRBCs). By early morning, despite active resuscitation, his clinical status deteriorated further. The haemoglobin level plunged to 6.7 g/dL, and his tachycardia worsened.

Given the explicit failure of conservative resuscitation, the patient was taken for an emergency exploratory laparotomy. The intraoperative findings confirmed massive hemoperitoneum with large-volume clot formation. Evacuation of the clots revealed an extensive lower pole splenic laceration arising directly over a ruptured vascular structural anomaly.

Surrounding structural components prone to mechanical collateral injury were carefully inspected and found to be intact. An emergency splenectomy was performed with secure hilar ligation.

The patient received multiple perioperative blood transfusions, and his postoperative course was uneventful. Prior to discharge, he was immunized against encapsulated organisms

(*Streptococcus pneumoniae*, *Neisseria meningitidis*, and *Haemophilus influenzae*) according to standard surgical protocols. He was discharged in a clinically stable condition for routine outpatient follow-up.

The surgical specimen was submitted for microscopic evaluation. The final histopathology report identified a large benign cavernous hemangioma localized to the lower pole of the spleen, displaying clear structural margins of capsular rupture and fresh focal hemorrhage.



Figure 1: Preoperative contrast-enhanced computed tomography (CECT) of the abdomen.

Axial section demonstrating the replacement of normal splenic tissue by a massive, heterogeneous, predominantly hyperdense subcapsular and intraparenchymal acute hematoma (measuring $15.9 \times 17.6 \times 16.9$ cm). A distinct 4.9 cm laceration is visible at the lower pole of the spleen, accompanied by moderate-to-gross free intraperitoneal fluid (hemoperitoneum).

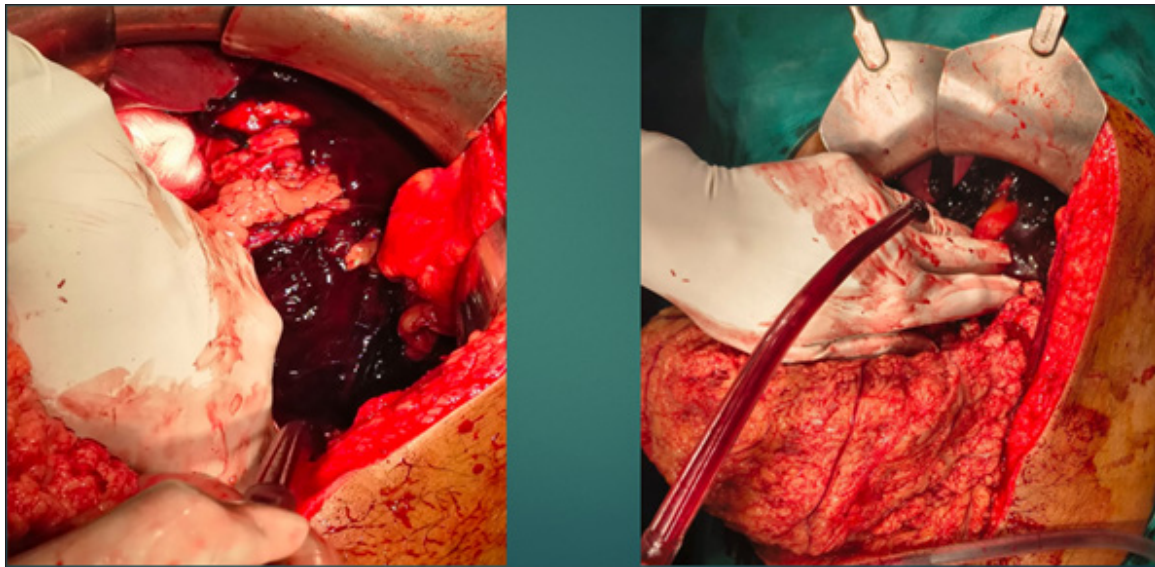


Figure 2: Intraoperative findings during emergency exploratory laparotomy.

Evacuation of large volume blood clots from the left upper quadrant, revealing an extensive active laceration isolated to the lower pole of the spleen with underlying vascular structure disruption.

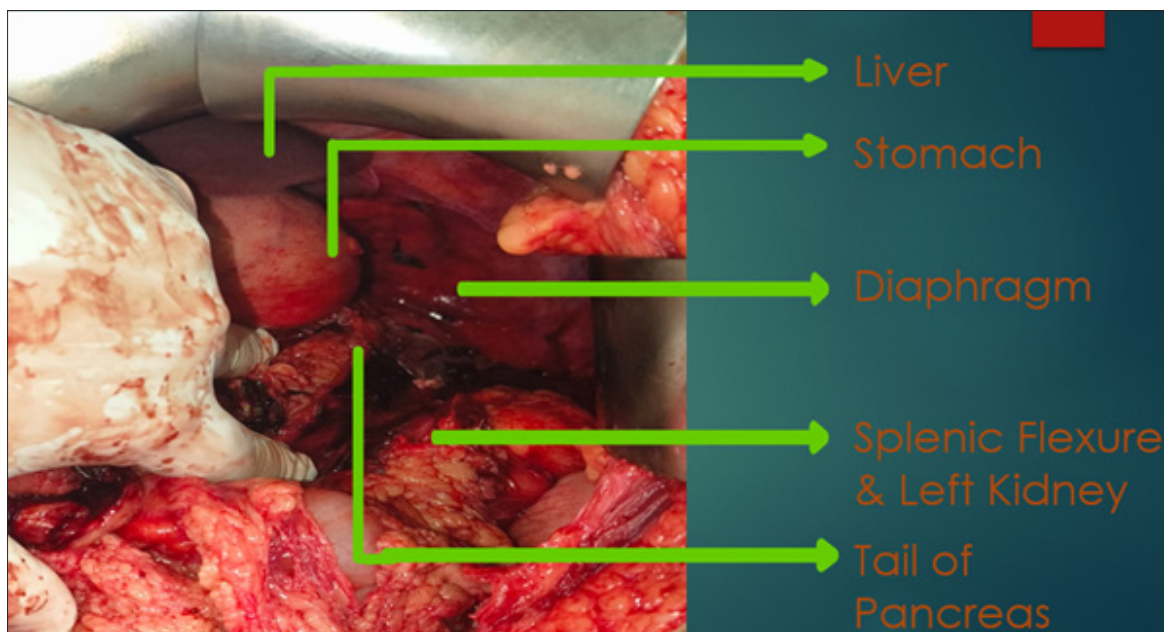


Figure 3: Intraoperative exposure of surrounding anatomical structures.

Systematic inspection of adjacent abdominal viscera and ligaments prone to collateral traction or mechanical injury prior to secure hilar ligation and emergency splenectomy.

Discussion

A comprehensive review of iatrogenic endoscopic complications reveals that upper gastrointestinal tract procedures carry a minuscule risk of splenic injury compared to lower tract evaluations (Davis & Thapa, 2022). A recent systematic review identified only 52 documented cases of splenic injury following upper endoscopy globally (Davis & Thapa, 2022). Among those, ERCP accounted for 71% of the occurrences, making injuries related to conventional EGD an exceptional rarity (Davis & Thapa, 2022).

Statistically, abdominal pain remains the single most common presentation (79%), followed closely by hemodynamic

instability (67%) and an acute drop in baseline haemoglobin (58%) (Davis & Thapa, 2022). The median presentation timeline sits at approximately 4 hours post-procedure, though delayed symptoms presenting up to 144 hours later have been reported (Davis & Thapa, 2022). Due to the diagnostic accuracy required to rule out visceral perforation, CECT remains the gold standard modality, and approximately 76% of these patients eventually require emergency surgical intervention (Davis & Thapa, 2022).

The precise biomechanical aetiology of splenic injury during diagnostic EGD involves multiple combined factors. The primary theory suggests that the endoscope can transmit direct

mechanical force or torque along the greater curvature of the stomach, inducing severe traction across the gastrosplenic ligament (Davis & Thapa, 2022; Kim & Cho, 2023). This localized tension can lead to micro-tears or direct avulsion of the short gastric vessels or the splenic capsular tissue itself. Excessive looping or blind manipulation of the endoscope within a redundant or poorly compliant gastric body can exacerbate this traction (Kim & Cho, 2023).

Furthermore, over-insufflation of gas may drastically overdistend the stomach, putting massive strain on the perisplenic ligaments (Turner & Coleman, 2025). Violent, repeated retching or vomiting—which was heavily noted during our patient's endoscopy—substantially spikes intra-abdominal pressure, causing the abdominal walls and gastric margins to violently contract against the fixed splenic anatomy, avulsing the capsule (Davis & Thapa, 2022; Turner & Coleman, 2025). Our patient's clinical course mirrors a historical case report by Estevez-Boullosa et al., where a 52-year-old male developed severe abdominal pain and shock two hours after diagnostic EGD due to violent nausea that stretched the spleno-gastric and spleno-diaphragmatic connections (Kim & Cho, 2023). However, while their post-splenectomy histopathology showed an entirely normal spleen, our patient possessed a silent lower pole cavernous hemangioma.

The existence of this pre-existing vascular lesion served as an area of least resistance. The vascular channels compromised the normal compliance of the splenic parenchymal matrix, making the capsule overly fragile and highly vulnerable to sudden rises in intra-abdominal pressure and ligamentous traction.

The principal clinical challenge in these scenarios is the high risk of diagnostic delay. Post-endoscopic abdominal pain is routinely dismissed as benign gas distension or self-limiting insufflation discomfort (Davis & Thapa, 2022; Kim & Cho, 2023). This case underscores that progressive pain, unexpected tachycardia, or drops in haemoglobin must be aggressively worked up to avoid catastrophic hemorrhagic shock.

Conclusion

Splenic rupture following diagnostic EGD is an exceptional, life-threatening complication that carries a high mortality rate if unrecognised. Endoscopists and emergency clinicians must maintain extreme vigilance when evaluating patients with severe post-procedural pain. This risk is heavily magnified if the primary procedure was characterized by an uncooperative patient, intense retching, or a pre-existing, silent splenic vascular hemangioma.

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