Case report

Crit Care Shock (2026) 29:163-168

To operate or to observe? Critical decision-making and intensive observation in spontaneous short gastric artery rupture

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Abstract

Spontaneous rupture of a short gastric artery with resultant hemoperitoneum is an exceptionally rare clinical entity that carries a significant risk of impending hemorrhagic shock. This report presents a 23-year-old male who developed acute left upper quadrant pain following forceful vomiting. Initial management was challenged by a concerning decline in hemoglobin. Computed tomography (CT) revealed active extravasation from a splenic artery branch, initially mimicking a ruptured splenic artery aneurysm. However, subsequent urgent angiography failed to identify the active bleeding site, presenting a critical clinical dilemma: to operate or to observe. Given the patient's relatively stable hemodynamics, rigorous intensive observation and serial monitoring were elected over prophylactic exploratory laparotomy. A follow-up CT scan three days after angiography confirmed the absence of contrast extravasation. This case highlights the diagnostic challenge of abdominal apoplexy and underscores the crucial role of critical decision-making and intensive clinical observation in safely managing hemodynamically stable patients with negative angiography.

Keywords: Short gastric artery rupture, hemorrhagic shock, critical decision-making, intensive observation, acute abdominal pain.

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Introduction

Spontaneous rupture of a short gastric artery, causing hemoperitoneum (abdominal apoplexy), is an exceedingly rare event that poses significant diagnostic and therapeutic challenges in the emergency and critical care settings. While the precise etiology remains unclear, forceful vomiting or retching has been implicated as a potential precipitating factor in several reported cases, possibly due to shearing forces on the gastrosplenic ligament. (1–5) The limited available literature primarily describes cases managed with emergent laparotomy, emphasizing the potential for significant morbidity and rapid progression to hemorrhagic shock associated with delayed diagnosis and treatment. (2,5,6) This report details a unique case of a young adult presenting with acute abdominal pain following episodes of forceful emesis, who presented a critical decision-

making dilemma after negative angiography. The patient was successfully managed with rigorous intensive observation. This case underscores the importance of considering this rare differential diagnosis in patients presenting with abdominal pain after vomiting. It demonstrates the potential for intensive hemodynamic monitoring and a non-operative approach in carefully selected cases. This report aims to elucidate further the clinical presentation, diagnostic considerations, and critical care management options for this rare but potentially life-threatening condition.

Case presentation

A 23-year-old male presented to the emergency department with acute-onset left upper quadrant pain of less than 24-hour duration, associated with intermittent, severe epigastric pain. He reported several episodes of forceful emesis in the preceding 24 hours, precipitated by a binge drinking episode. On admission, vital signs were blood pressure 121/57 mmHg, heart rate 91 bpm, respiratory rate 18 breaths/minute, and temperature 36.3 °C. The patient reported a constant, sharp, stabbing pain rated 7–8 on the Numerical Rating Scale (NRS), exacerbated by lying supine and deep inspiration, and relieved by sitting or standing. Physical examination revealed a flat abdomen with diminished bowel sounds and localized tenderness in the left upper quadrant; rebound tenderness was absent. Initial laboratory results revealed: white blood cell count $11.86 \times 10^3/\mu l$, hemoglobin 13.6 g/dl, and platelet count 223,000/μl. The patient was admitted for strict observation. On hospital day 1, vital signs remained stable, but repeat blood work showed a concerning decrease in hemoglobin to 10.9 g/dl.

Abdominal computed tomography (CT) angiography revealed a large, high-density mass-like lesion in the left upper quadrant with substantial high-density ascites. Notably, an approximately 1-cm enhancing nodular lesion was observed near a branch of the splenic artery supplying the short gastric vessels (**Figure 1**). These findings initially raised a strong suspicion of a splenic artery aneurysm rupture with active extravasation. Given the declining hemoglobin level, urgent selective and super selective angiography was performed. However, during the angiographic procedure of the splenic and short gastric arteries, no active bleeding focus or extravasation was identified, suggesting temporary spontaneous hemostasis (**Figure 2**). Because the patient's vital signs remained relatively stable and there was no definitive target for embolization, a critical decision was made to employ intensive clinical observation with rigorous hemodynamic monitoring rather than proceeding with surgical exploration.

A follow-up CT scan performed three days after the angiography demonstrated a persistent huge hematoma occupying the gastrosplenic space. Crucially, there was no evidence of active contrast extravasation (**Figure 3**). The patient's condition continued to improve without the need for operative intervention. He was discharged without complication and returned to normal activities.

Discussion

Abdominal apoplexy is a rare yet severe clinical condition that can occur spontaneously due to various underlying mechanisms. (3,5–7) This case report presents a 23-year-old male who experienced spontaneous rupture of the short gastric artery following episodes of vomiting. The association between gastric rupture and emesis is noteworthy, as it underscores critical clinical insights.

Vomiting leads to a significant increase in intra-abdominal pressure, which substantially affects the organs and blood vessels within the abdominal cavity. During emesis, abdominal muscles contract vigorously. In cases of repeated vomiting, the stomach distends due to the increased burden, subsequently stretching the gastrosplenic ligament that lies between the stomach and spleen. This mechanical stress can exert excessive tensile forces on the short gastric artery and its associated vessels, thereby heightening the risk of rupture. (1,2,4,5) The study by Hayes et al. frequently cites the mechanism by which vomiting may precipitate the rupture of the short gastric artery. (1)

This case emphasizes the necessity of considering abdominal apoplexy in patients presenting with abdominal pain and antecedent vomiting. Early diagnosis of rare pathologies such as short gastric artery rupture is imperative to prevent progression to hemorrhagic shock. (3,4) The utilization of CT scanning facilitates rapid identification of vascular rupture. (8–10) In our case, the initial radiological presentation, featuring a 1-cm enhancing nodule, strongly mimicked a ruptured splenic artery aneurysm. This highlights the profound diagnostic ambiguity often encountered in these acute presentations, where rapid imaging interpretation is critical yet challenging.

In this case, despite the initial CT scan demonstrating active extravasation, subsequent urgent angiography failed to localize the bleeding source because spontaneous hemostasis and the tamponade effect of the expanding hematoma had occurred. (8,9) When an active bleeding site cannot be identified angiographically, a critical decision-making dilemma emerges: to proceed with prophylactic ex-

ploratory laparotomy or to commit to intensive observation. In our patient, the absence of ongoing hemodynamic instability allowed for a non-operative approach consisting of intensive hemodynamic monitoring and serial hemoglobin assessments. Rigorous observation of hemodynamically stable patients avoids the significant morbidity associated with exploratory laparotomy. (6,10) The successful resolution without rebleeding validates intensive clinical observation as a viable strategy in carefully selected cases, provided they are managed in a critical care setting with immediate access to surgical intervention if needed. (10)

Conclusion

This case report illustrates that spontaneous rupture of the short gastric artery, while clinically rare, can occur in young patients and poses a hidden risk of hemorrhagic shock. Furthermore, this case demonstrates that in the presence of negative angiography and hemodynamic stability, the difficult decision between operative and non-operative management can be successfully navigated through rigorous intensive observation. Timely diagnostic imaging, combined with critical decision-making and strict clinical monitoring, can substantially improve patient outcomes, asserting the importance of vigilance and adaptability in acute care surgery and critical care practice.

Conflict of interest

The authors have no conflicts of interest to disclose.

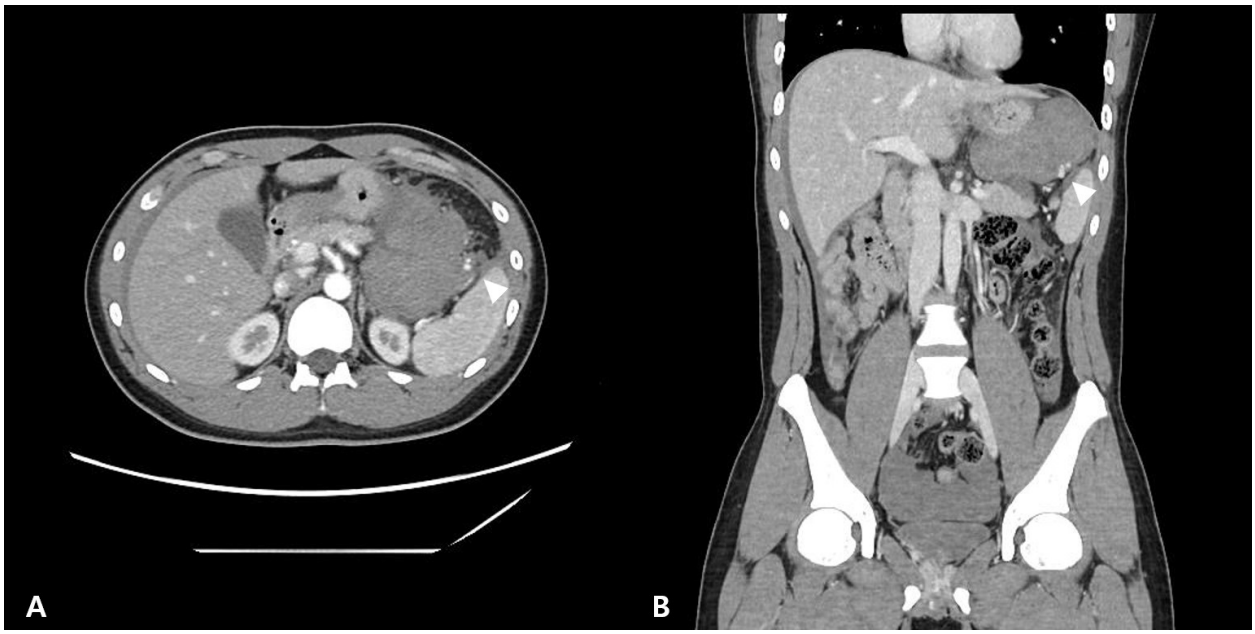
Source of funding

The authors received no funding for this report.

Informed consent

Consent was obtained from the patient for the report.

Figure 1. Initial contrast-enhanced abdominal computed tomography findings

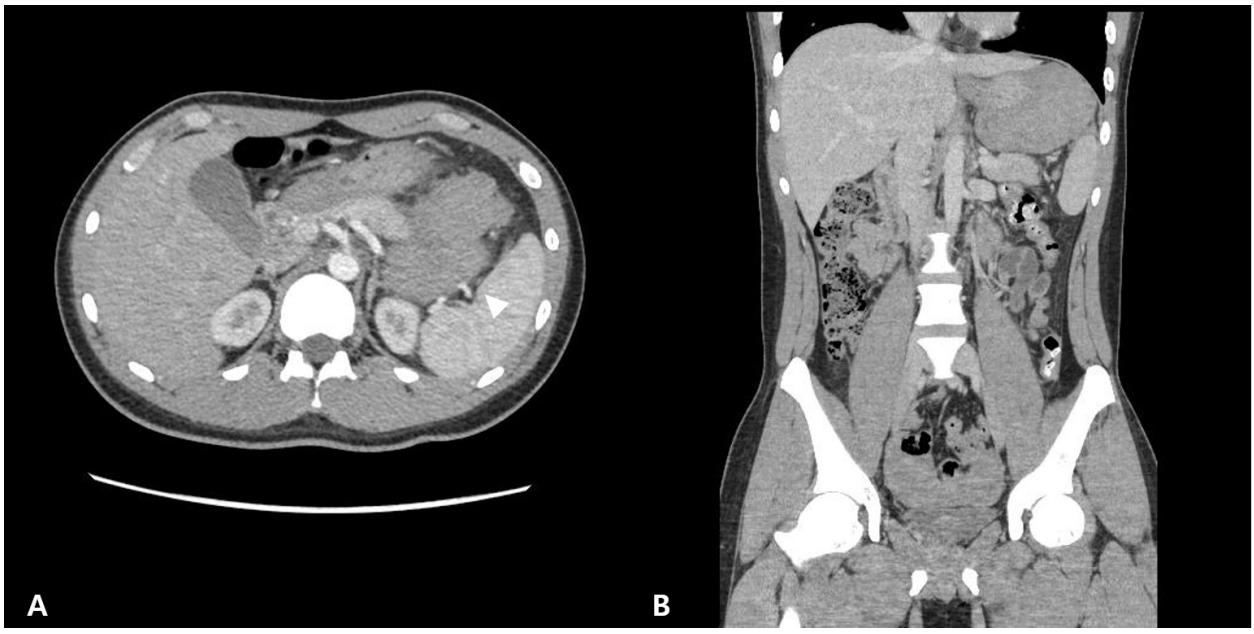


Legend: Axial (A) and coronal (B) views demonstrate a large, high-density, mass-like lesion with equivocal enhancement in the left upper quadrant, representing an extensive hematoma. An approximately 1-cm enhancing nodular lesion is noted near a branch of the splenic artery (arrowheads), indicating active contrast extravasation. Additionally, a large amount of high-density ascites is present, consistent with hemoperitoneum.

Figure 2. Urgent selective abdominal angiography

Legend: (A) Selective angiogram of the splenic artery demonstrates intact vascular structures with no evidence of active contrast extravasation. (B) Super selective angiogram of the short gastric artery branches also reveals no active bleeding focus. The absence of ongoing hemorrhage during the procedure suggests temporary spontaneous hemostasis, which supported the critical decision to proceed with intensive clinical observation rather than surgical intervention.

Figure 3. A follow-up abdominal computed tomography scan obtained three days after angiography



Legend: Axial (A) and coronal (B) views demonstrate a large, persistent hematoma occupying the gastrosplenic space between the stomach and the spleen. Crucially, there is no evidence of active contrast extravasation or ongoing hemorrhage, validating the success of the intensive clinical observation.

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