Splenic rupture as a rare colonoscopy complication: a case report with clinical and medico-legal insights

Filippo Gibelli[1]^, Giulio Nittari[2]^, Giovanna Ricci[1]^

[1]Section of Legal Medicine, School of Law, University of Camerino, Camerino, Italy; [2]Telemedicine and Telepharmacy Centre, School of Medicinal and Health Products Sciences, University of Camerino, Camerino (MC), Italy

Contributions: (I) Conception and design: F Gibelli; (II) Administrative support: None; (III) Provision of study materials or patients: F Gibelli; (IV) Collection and assembly of data: F Gibelli, G Ricci; (V) Data analysis and interpretation: F Gibelli, G Nittari; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

Correspondence to: Giulio Nittari, PhD, PharmD. Telemedicine and Telepharmacy Centre, School of Medicinal and Health Products Sciences, University of Camerino, Via Madonna delle Carceri, 9, Camerino (MC) 62032, Italy. Email: giulio.nittari@unicam.it.

Background: Splenic rupture is an exceedingly rare but potentially life-threatening complication of colonoscopy, with an estimated incidence of less than 1 in 100,000 procedures and a reported mortality rate of up to 5%. Due to its non-specific and often subtle clinical presentation—typically involving left upper quadrant or generalized abdominal pain—it may be misdiagnosed or diagnosed late, which can result in a significant worsening of patient outcomes. Early recognition and prompt management are therefore essential not only for improving clinical prognosis but also for preventing potential medico-legal disputes related to diagnostic delays or alleged procedural negligence. Raising awareness among clinicians of this rare complication, especially in the presence of risk factors such as difficult colonoscopy, adhesions, or splenomegaly, is of critical importance.

Case Description: A 68-year-old woman underwent a routine colonoscopy for recurrent polyps. The procedure was uneventful, and she was discharged with post-procedural instructions. The following day, she developed persistent abdominal pain, initially treated with analgesics. Progression to hypotension and abdominal distension prompted emergency imaging, revealing hemoperitoneum due to splenic rupture. An emergent splenectomy was performed, confirming multiple splenic lacerations. The patient recovered fully postoperatively with supportive management.

Conclusions: This case highlights the importance of maintaining a high index of suspicion for splenic injury in patients presenting with delayed abdominal pain after colonoscopy. Detailed informed consent, strict post-procedural monitoring, and patient education are essential for minimizing complications and addressing medico-legal challenges.

Keywords: Splenic rupture; colonoscopy complications; case report; medico-legal implications; post-procedural monitoring

Received: 18 December 2024; Accepted: 11 April 2025; Published online: 24 October 2025.

doi: 10.21037/tgh-24-165

View this article at: https://dx.doi.org/10.21037/tgh-24-165

^ ORCID: Filippo Gibelli, 0000-0003-0861-3218; Giulio Nittari, 0000-0002-7918-8442; Giovanna Ricci, 0000-0002-0445-0987.

Introduction

Background

Splenic injury is a rare but potentially life-threatening complication of colonoscopy, with an estimated incidence ranging from 0.00005% to 0.034% (1) and a reported mortality rate of up to 5% (2). There are just over 100 cases reported in the literature (3). The true incidence of the complication, however, is probably underestimated due to underreporting (4).

First described in 1974 by Wherry and Zehner (5), this complication is considered one of the rarest among severe adverse events associated with colonoscopy, which include perforation and bleeding. Unlike these more common complications, splenic injury is often underdiagnosed, as early symptoms—such as abdominal pain and peritonism—are frequently attributed to more benign post-procedure phenomena like air insufflation or colonic distension. This delayed recognition may also be exacerbated by sedation, analgesia, or preexisting conditions, particularly in older or cognitively impaired patients.

The typical patient presenting with splenic rupture following colonoscopy is a female, with reports indicating that 72–75% of cases occur in women (1). The median age for these patients is around 65 years, consistent across various studies, with no significant association found between prior abdominal surgery and an increased risk of injury (6,7). This complication may arise unexpectedly even in seemingly uncomplicated colonoscopies performed by experienced endoscopists.

The pathophysiological mechanism of splenic injury during colonoscopy is multifactorial and not yet fully understood (8). Direct injury to the spleen can occur due to excessive traction on the splenocolic ligaments, particularly when external pressure is applied to the left hypochondrium to straighten the colonoscope or when looping of the scope increases tension at the splenic flexure (9). Additionally, adhesions from previous abdominal surgeries, splenomegaly, or the presence of a large polyp or mass can increase the likelihood of splenic capsular avulsion and laceration (10). Sedation, which reduces patients' perception of pain, has also been implicated as it may lead to delayed identification of complications. Maneuvers such as excessive torque or force during difficult intubation, or ancillary techniques like repositioning the patient, can exacerbate the risk (11).

Diagnosing splenic rupture after colonoscopy can be challenging because symptoms are often delayed and nonspecific. The majority of patients present with symptoms within the first 24–48 hours, with left upper quadrant abdominal pain being the most common complaint (1). Some patients may also experience generalized abdominal pain, back pain, or chest pain. Kehr's sign, characterized by referred pain to the left shoulder due to diaphragmatic irritation, can be present but is not always reliable (12). Hemodynamic instability, nausea, vomiting, abdominal distension, and guarding may also occur but are inconsistent findings. Imaging studies, particularly computed tomography (CT), are critical for definitive diagnosis as they provide accurate detection of splenic injuries, including hematomas, lacerations, and hemoperitoneum. CT can further guide management decisions by delineating the extent of injury. Ultrasound, though useful for detecting free fluid, may be limited by bowel gas following colonoscopy, while paracentesis and angiography are less frequently used (13,14).

Management of post-colonoscopy splenic rupture depends on the patient's hemodynamic status and the severity of the injury. Splenectomy via laparotomy remains the most common therapeutic intervention, particularly in hemodynamically unstable patients. Conservative management, including close monitoring, bed rest,

Highlight box

Key findings

- This case demonstrates a rare instance of splenic rupture following an otherwise uneventful colonoscopy, underscoring the importance of early recognition and intervention to prevent fatal outcomes.

What is known and what is new?

- Splenic injury is a rare but severe complication of colonoscopy, often presenting with delayed abdominal pain and hypotension. Risk factors include procedural torque, adhesions, and sedation masking symptoms.
- This report reinforces the need for increased awareness among clinicians regarding splenic injury post-colonoscopy. It highlights the medico-legal significance of informed consent, post-procedural monitoring, and standardized discharge protocols. The case presented also clarifies how adequate physician-patient communication regarding the realization of possible complications not necessarily due to malpractice can reduce the risk of litigation.

What is the implication, and what should change now?

- Clinicians should maintain vigilance for post-procedural complications, educate patients about red-flag symptoms, and ensure robust documentation. Medico-legal protocols must address rare complications like splenic rupture to safeguard both patients and healthcare providers. Clear communication between doctor and patient should also be promoted regarding rare complications.

intravenous fluids, blood transfusions, and serial imaging, may be attempted in stable patients with localized hematomas and no active bleeding. Arterial embolization has also been successfully reported as an alternative to surgery, preserving splenic function. Despite advancements in conservative approaches, surgical intervention remains the definitive treatment for significant injuries or failed non-operative management (15,16).

The outcomes of splenic rupture following colonoscopy are generally favorable when promptly recognized and treated, although mortality rates of around 4.5–5% have been reported (2). Delayed diagnosis, however, can significantly worsen patient outcomes, underscoring the importance of maintaining a high index of suspicion in patients who develop abdominal pain or hemodynamic instability following colonoscopy (17-21).

Rationale and knowledge gap

Splenic rupture following colonoscopy is an exceptionally rare yet potentially life-threatening complication. Despite the increasing frequency of colonoscopies as both diagnostic and therapeutic procedures, awareness of this complication remains limited. Most cases of splenic injury are diagnosed late due to non-specific symptoms, such as delayed abdominal pain, which are often misinterpreted or managed inadequately in outpatient settings. The lack of standardized protocols for recognizing and addressing such complications contributes to delays in diagnosis and increases morbidity.

A clear knowledge gap exists regarding the precise mechanisms of splenic rupture during colonoscopy, its predisposing factors, and appropriate preventive measures. The literature remains sparse, consisting primarily of isolated case reports and small retrospective studies. This limits the ability to establish robust clinical guidelines, leaving a significant medico-legal vulnerability in situations where adverse outcomes occur. Addressing this gap is crucial to improve clinical practice, ensure patient safety, and mitigate medico-legal risks for healthcare providers.

Objective

The objective of this case report is to highlight the occurrence of splenic rupture as a rare complication of colonoscopy, emphasizing its clinical presentation, diagnostic challenges, and management. The report aims to underscore the medico-legal implications associated with delayed recognition of this complication, including issues of informed consent, procedural technique, and post-procedural monitoring. By drawing comparisons with existing literature, this analysis seeks to enhance awareness among clinicians, provide recommendations for early diagnosis, promote strategies to minimize the risk of splenic injury during colonoscopy, and reduce the risk of medical-legal litigation. We present this article in accordance with the CARE reporting checklist (available at https://tgh.amegroups.com/article/view/10.21037/tgh-24-165/rc) (22).

Case presentation

A 68-year-old woman with a medical history of hypertension, hypercholesterolemia, carotid stenosis, recurrent gastric and colonic polyps, hiatal hernia, uninvestigated hard palate thickening, and mild aortic stenosis, presented for a scheduled colonoscopy. As far as the biometric data are concerned, the height is not reported, while the weight is 63.5 kg. Her home medications included amlodipine 5 mg daily, cardioaspirin 100 mg daily, rosuvastatin/ezetimibe 5/10 mg daily, and pantoprazole 20 mg daily. The patient signed informed consent to anesthesia and colonoscopy. The informed consent to colonoscopy stated among the possible complications: "*Endoscopic complications: bleeding during examination … colon perforation … rupture of spleen: this is a rare but serious event and may require surgery*". The patient, afebrile and hemodynamically stable, tested negative for coronavirus disease 2019 (COVID-19) via rapid antigen screening. Premedication included midazolam 5 mg, propofol 30 mg, and scopolamine intravenously. Oxygen saturation remained at 99–100%, and heart rate ranged from 67 to 110 bpm during the procedure. The colonoscopy, described as uneventful, revealed small sessile, smooth, pink polyps in the right colon, left colon, and rectal ampulla, which were all removed for histological examination. The polyps were not removed with snare but with biopsy forceps in view of the tiny size of the formations (from the report: "*on the right colon*, *on the left colon and in the ampulla tiny sessile*, *millimetric*, *pinkish*, *smooth polypoid findings* (*all removed with forceps for histological examination*"). The bowel exhibited regular caliber, good distensibility, and intact mucosal integrity (from the report: "*the entire viscera have regular calibre*, *good distensibility to air insufflation*, *regular austral pattern*, *intact mucosal lining with normal transparency of the submucosal vascular pattern. Nothing at ampullary retroversion manoeuvre*"). The patient was discharged in stable condition with advice to refrain from certain activities

for 6–7 hours post-procedure.

The following day, the patient began experiencing abdominal pain localized to the epigastrium and right hypochondrium. Initial management by a general practitioner included analgesia with ketorolac. By the afternoon, the pain persisted, prompting referral to the emergency department (ED) by the gastroenterologist. In the ED, the patient appeared critically ill with a pale complexion, obtunded sensorium, and hypotension. Abdominal examination revealed a tense, distended abdomen with positive Blumberg sign. Emergency imaging, including an abdominal CT with contrast, identified a significant hemoperitoneum, an irregularly enhanced splenic mass consistent with hematoma, and active bleeding in the splenic region. The preoperative haemochromocytometric examination documented a haemoglobinemia of 6.6 g/dL. Immediate surgical intervention was deemed necessary.

The patient underwent emergency exploratory laparotomy within 1 hour of ED admission. Upon entering the peritoneal cavity, over 3 liters of blood were aspirated. Exploration revealed multiple deep splenic lacerations with active hemorrhage. A total splenectomy was performed, followed by thorough lavage of the abdominal cavity, hemostasis with fibrin glue, and placement of drains in the Douglas pouch and subphrenic region. The operation was completed without complications, and the patient was transferred to intensive care for postoperative monitoring and transfusion support.

Histopathological examination of the excised spleen confirmed capsular rupture, parenchymal lacerations, and subcapsular hematomas. Laboratory findings post-surgery showed marked anemia and leukocytosis, consistent with the acute hemorrhagic event and subsequent inflammatory response. The patient required three transfusions and close monitoring of hematological parameters. Postoperative recovery was unremarkable aside from transient thrombocytosis attributed to asplenia. Follow-up imaging showed resolution of abdominal fluid collections, with residual changes consistent with recent surgery.

The patient was discharged 11 days after admission, in stable condition, fully mobilized, and tolerating a light diet. She was prescribed prophylactic antibiotics, anticoagulation, and supportive supplements, with a follow-up scheduled for outpatient evaluation.

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Declaration of Helsinki and its subsequent amendments. Written informed consent for publication of this case report was not obtained from the patient or the relatives after all possible attempts were made.

Discussion

Key findings

This case highlights a rare but serious complication of colonoscopy, splenic rupture, in a 68-year-old woman with pre-existing comorbidities. The patient developed abdominal pain the day following an uneventful colonoscopy, which was initially managed with analgesics without further evaluation. Rapid progression to hypotension, tense abdomen, and critical illness prompted urgent emergency care. Abdominal CT revealed hemoperitoneum, active bleeding, and splenic hematoma, necessitating immediate surgical intervention. Exploration confirmed multiple deep splenic lacerations with significant hemorrhage, leading to a total splenectomy. Postoperative recovery was uncomplicated, with transient thrombocytosis and close monitoring. Prophylactic treatment and follow-up care were appropriately administered. From a medico-legal perspective, the case underscores the importance of recognizing splenic rupture as a potential complication of colonoscopy, timely diagnosis of delayed complications, and ensuring appropriate post-procedural instructions.

Strengths and limitations

The strengths of this case include comprehensive documentation of the procedural details, clinical progression, imaging findings, and surgical management, providing a robust timeline for medico-legal assessment. Prompt escalation of care following persistent symptoms ensured the patient received life-saving intervention without further delay. Histopathological confirmation of splenic rupture supports causality between the colonoscopy and the subsequent hemorrhagic event.

However, the case has some limitations. The lack of prior imaging of the spleen prevents assessment of pre-existing splenic pathology or risk factors, such as splenomegaly or adhesions. The absence of documented post-procedural physical examination before discharge could have identified early signs of intra-abdominal bleeding. Limited exploration of contributing factors, such as sedation depth, mechanical stress during polypectomy, or positional maneuvers, may also have predisposed the patient to splenic injury.

Comparison with similar researches

The case under discussion aligns closely with existing literature on post-colonoscopy splenic rupture. Consistent with reported data, the patient is a female around 65 years old, reflecting the observed higher incidence in women with a median age of approximately 65 years.

The clinical presentation was insidious, with symptoms manifesting within 24 hours post-procedure, a common timeframe noted in similar cases. The use of CT imaging was instrumental in diagnosing the splenic injury, corroborating the literature that identifies CT as the preferred diagnostic modality due to its high sensitivity and specificity.

Therapeutically, the patient underwent a splenectomy, which remains a prevalent treatment approach, especially in hemodynamically unstable patients or when conservative management is unfeasible. The favorable outcome observed in this case is also in line with existing reports, where prompt recognition and appropriate intervention typically lead to positive patient prognoses.

Why does the case we reported deserve to be shared with the scientific community? Because, despite its alignment with the general patterns observed in the literature, our case presents several distinctive features that underscore its uniqueness. Notably, the colonoscopy was described as entirely uneventful, with no technical difficulties, minimal instrumentation (biopsy forceps only), and no signs of trauma or excessive insufflation—factors often implicated in splenic injury. Moreover, the patient was not on anticoagulants or antiplatelet agents beyond low-dose aspirin, and no pre-existing splenic pathology was documented, ruling out common risk enhancers. The delayed yet abrupt clinical deterioration within 24 hours, coupled with an atypical pain distribution (epigastric and right hypochondrial), may have further masked early recognition. The case also stands out for the sheer volume of hemoperitoneum (>3 liters) and the severity of splenic disruption despite the procedural simplicity. Taken together, these elements suggest that even low-risk, technically simple colonoscopies can result in catastrophic complications, reinforcing the need for heightened clinical vigilance regardless of intraoperative findings.

Explanations of findings

The etiology of splenic rupture following colonoscopy is multifactorial. Excessive manipulation of the colonoscope, particularly in cases of looping or difficult navigation, can transmit traction forces to the splenocolic ligament, leading to splenic capsular tears or rupture. The patient's recurrent colonic polyps and prior gastrointestinal issues may suggest previous inflammation or adhesions, predisposing the spleen to injury. Deep sedation with propofol and midazolam could reduce the patient's perception of pain during the procedure, masking subtle intra-abdominal injury.

From a medico-legal perspective, these findings highlight the need for detailed informed consent discussing rare complications like splenic rupture. Careful procedural technique to minimize torque and manipulation, along with post-procedural monitoring and patient education, is essential to ensure early recognition of complications.

Implications and actions needed

This case carries significant medico-legal implications and highlights essential actions to mitigate risks in clinical practice. First, colonoscopy consent forms must explicitly include rare but severe complications such as splenic rupture. Importantly, clinicians should explain to patients that splenic rupture can occur even with appropriate and non-negligent traction on the splenocolic ligament, emphasizing the inherent risks associated with the procedure. Providing this information in advance could reduce the likelihood of medico-legal disputes and litigation, as patients may be less inclined to pursue legal action if they feel adequately informed beforehand.

In terms of clinical risk management, specific recommendations should be provided to patients upon discharge, including a detailed explanation of sentinel symptoms of splenic rupture, such as persistent or worsening abdominal pain, left shoulder pain (Kehr's sign), dizziness, or signs of internal bleeding. These instructions should stress the importance of seeking immediate medical care if such symptoms arise.

Additionally, clinicians should implement stricter post-procedural protocols, such as thorough abdominal examinations before discharge, and clear, written post-procedural guidance to ensure patient awareness and compliance.

A particularly heightened surveillance system should be considered in cases where colonoscopy involves challenging manipulations of the colon, such as increased torque or significant stress on the splenocolic ligament. This is especially critical for patients with known risk factors, such as prior abdominal surgery, adhesions, or splenomegaly. In

these situations, clinicians should maintain a low threshold for prolonged observation or additional imaging studies to rule out potential splenic injuries before discharging the patient.

For EDs, maintaining a high index of suspicion for splenic rupture in patients presenting with abdominal pain following colonoscopy is paramount. Prompt recognition, timely imaging (such as CT scans), and appropriate intervention can significantly improve patient outcomes.

From a procedural standpoint, endoscopists must strictly adhere to best practices aimed at minimizing torque and mechanical stress during the procedure, particularly in difficult cases or when encountering anatomical variations.

Comprehensive and detailed procedural documentation remains essential to defend against potential medico-legal claims and to demonstrate adherence to the standard of care.

Finally, this case underscores the need for a multidisciplinary approach to risk mitigation. Combining informed consent practices, rigorous discharge protocols, patient education, and vigilant post-procedural monitoring can not only improve patient safety and outcomes but also significantly reduce medico-legal risks and prevent similar adverse events in the future.

Conclusions

Splenic rupture, though rare, is a potentially life-threatening complication of colonoscopy that requires urgent recognition and management. This case emphasizes the critical role of thorough post-procedural assessment, timely imaging for atypical abdominal symptoms, and patient education to ensure optimal outcomes. Furthermore, proper informed consent and meticulous procedural documentation are necessary to mitigate medico-legal risks for healthcare providers.

Acknowledgments

None.

Footnote

Reporting Checklist: The authors have completed the CARE reporting checklist. Available at https://tgh.amegroups.com/article/view/10.21037/tgh-24-165/rc

Peer Review File: Available at https://tgh.amegroups.com/article/view/10.21037/tgh-24-165/prf

Funding: None.

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://tgh.amegroups.com/article/view/10.21037/tgh-24-165/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Declaration of Helsinki and its subsequent amendments. Written informed consent for publication of this case report was not obtained from the patient or the relatives after all possible attempts were made.

References

1. Ha JF, Minchin D. Splenic injury in colonoscopy: a review. Int J Surg 2009;7:424-7.
2. Goitein D, Goitein O, Pikarski A. Splenic rupture after colonoscopy. Isr Med Assoc J 2004;6:61-2.
3. Piccolo G, Di Vita M, Cavallaro A, et al. Presentation and management of splenic injury after colonoscopy: a systematic review. Surg Laparosc Endosc Percutan Tech 2014;24:95-102.
4. Barbeiro S, Atalaia-Martins C, Marcos P, et al. Splenic Rupture as a Complication of Colonoscopy. GE Port J Gastroenterol 2017;24:188-92.
5. Wherry DC, Zehner H Jr. Colonoscopy-fiberoptic endoscopic approach to the colon and polypectomy. Med Ann Dist Columbia 1974;43:189-92.
6. Lalor PF, Mann BD. Splenic rupture after colonoscopy. JSLS 2007;11:151-6.
7. Shatz DV, Rivas LA, Doherty JC. Management options of

colonoscopic splenic injury. JSLS 2006;10:239-43.
8. García García MJ, Castañera González R, Martín Rivas B, et al. Splenic rupture after colorectal cancer screening. Rev Esp Enferm Dig 2015;107:705-6.
9. Abunnaja S, Panait L, Palesty JA, et al. Laparoscopic splenectomy for traumatic splenic injury after screening colonoscopy. Case Rep Gastroenterol 2012;6:624-8.
10. Espinal EA, Hoak T, Porter JA, et al. Splenic rupture from colonoscopy. A report of two cases and review of the literature. Surg Endosc 1997;11:71-3.
11. Corcillo A, Aellen S, Zingg T, et al. Endovascular treatment of active splenic bleeding after colonoscopy: a systematic review of the literature. Cardiovasc Intervent Radiol 2013;36:1270-9.
12. Tsoraides SS, Gupta SK, Estes NC. Splenic rupture after colonoscopy: case report and literature review. J Trauma 2007;62:255-7.
13. Johnson C, Mader M, Edwards DM, et al. Splenic rupture following colonoscopy: two cases with CT findings. Emerg Radiol 2006;13:47-9.
14. Castelli M. Splenic rupture: an unusual late complication of colonoscopy. CMAJ 1986;134:916-7.
15. Ahmed A, Eller PM, Schiffman FJ. Splenic rupture: an unusual complication of colonoscopy. Am J Gastroenterol 1997;92:1201-4.
16. Holubar S, Dwivedi A, Eisdorfer J, et al. Splenic rupture: an unusual complication of colonoscopy. Am Surg 2007;73:393-6.
17. Ong E, Böhmler U, Wurbs D. Splenic injury as a complication of endoscopy: two case reports and a literature review. Endoscopy 1991;23:302-4.
18. Dodds LJ, Hensman C. Splenic trauma following colonoscopy. Aust N Z J Surg 1993;63:905-6.
19. Reynolds FS, Moss LK, Majeski JA, et al. Splenic rupture following colonoscopy. Gastrointest Endosc 1986;32:307-8.
20. Sarhan M, Ramcharan A, Ponnapalli S. Splenic injury after elective colonoscopy. JSLS 2009;13:616-9.
21. Petersen CR, Adamsen S, Gocht-Jensen P, et al. Splenic injury after colonoscopy. Endoscopy 2008;40:76-9.
22. Gagnier JJ, Kienle G, Altman DG, et al. The CARE Guidelines: Consensus-based Clinical Case Reporting Guideline Development. Glob Adv Health Med 2013;2:38-43.

doi: 10.21037/tgh-24-165
Cite this article as: Gibelli F, Nittari G, Ricci G. Splenic rupture as a rare colonoscopy complication: a case report with clinical and medico-legal insights. Transl Gastroenterol Hepatol 2025;10:75.

