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Splenic rupture following colonoscopy: Case report and literature review



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ABSTRACT

INTRODUCTION: Colonoscopy is a safe and routinely performed diagnostic and therapeutic procedure for colorectal diseases. Although bleeding and perforation are most common complications, extra colonic or visceral injuries have been described. Splenic rupture is rare with few cases reported in current literature. **PRESENTATION OF CASE:** We report the case of a 73-year old man who presented to surgical consultation 50 h after colonoscopy. Clinical, laboratory and imaging findings were suggestive for haemoperitoneum. At surgery an almost complete splenic disruption was evident and urgent splenectomy was performed. **DISCUSSION:** Splenic injury following colonoscopy is exceptional, probably related to instrumental looping with excessive traction on the splenocolic ligament. In patients with an early presentation a sudden onset of symptoms is the rule. By contrast a delayed presentation (>48 h) is nonspecific and subtle with arduous diagnosis.

CONCLUSION: Awareness of this potential complication, high level of suspicion and prompt treatment are at the basis of better outcomes in such patients.

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1. Introduction

Colonoscopy is a safe and routinely performed diagnostic and therapeutic procedure for large bowel diseases. Post procedural bleeding occurs rarely in diagnostic procedures even whenever a biopsy is included (<1%) [1,2]. Bleeding risk is increased in case of therapeutic manoeuvres such as polypectomy (1–2%), stricture dilation and endoscopic mucosal resection (1–6%) [3–5]. Perforation rates varies ranging from 0.01–0.1% in diagnostic colonoscopy to 5–6% in case of endoscopic mucosal resection (EMR), stricture dilation, or colonic stenting [6–8].

Splenic injury is a life threatening, underestimated and rare complication with a variable incidence (0.00005 to 0.017%) [9]. Because of its rarity and lack of awareness, the diagnosis may be delayed with an increased risk of morbidity and mortality [2]. Wherry DC et al. in 1974 firstly described the unusual case of a splenic rupture after colonoscopy [10]. Since then, few cases have been reported even with a late presentation (more than 48 h). We present the case of a delayed splenic rupture successfully managed with urgent splenectomy.

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2. Case report

A 73-year old man, without previous abdominal surgery, no comorbid and no chronic home medications underwent colonoscopy for abdominal pain and weight loss. The exam shows the presence of two sub-centimetric polyps at the splenic flexure both successfully removed with a diathermic loop. The procedure was performed under conscious sedation (Midazolam 5 mg) by a 30-years experienced endoscopist. Colonoscopy lasted 25 min and was completed without complications. Three hours after the procedure the patient does not complaint any warning symptoms, vital parameters were within normal limits, and after physical examination was discharged home. Fifty hours after the procedure, the patient came to the emergency department for sudden left-upper abdominal pain, left shoulder pain, and diffuse peritonism. On medical history recent blunt abdominal trauma wasn't reported. On examination, hypotension (90/50 mmHg) and tachycardia (115 bpm) were immediately noted. On laboratory exams a decrease in haemoglobin and haematocrit level (Hb: 7 g/dl; Ht 21% respectively) were found. White blood cell count and CRP were within normal limits.

Urgent abdominal CT scan demonstrated a large grade III sub-capsular splenic hematoma, suspicious capsule laceration, haemoperitoneum, and no evidence of pneumoperitoneum (Fig. 1). At exploration a large splenic capsule disruption was noted with consensual haemoperitoneum (about two liters of blood). After



Fig. 1. Large sub capsular grade III splenic hematoma (102 × 131 × 140 mm) causing medial organ displacement with consensual haemoperitoneum. No signs of active parenchymal bleeding are appreciable on CT imaging (blush-sign).

medial mobilization, splenectomy was performed with selective hilar vessels ligation. No evidence of colonic wounds and peritoneal contamination were noticed. Postoperative course was uneventful and the patient was discharged home on postoperative day 6. Standard post-splenectomy vaccination were administered after surgery. At histologic examination there was no evidence of underlying splenic disease.

3. Discussion

Firstly described by Wherry DC et al. in 1974, splenic rupture following colonoscopy is exceptional with few cases reported in current literature [10]. The exact mechanism is unclear but probably direct trauma or excessive traction on the splenocolic ligament may cause subcapsular microlaceration [11,12]. Progressive bleeding may determine capsular distension with early abdominal discomfort wrongly attributable to visceral insufflation. Disruption with consequent haemoperitoneum occurs whenever pressure within hematoma exceed the capsular surface tension. Splenomegaly, inflammatory bowel disease, coagulopathies, antiplatelet medications, and inappropriate instrumental looping have been mentioned as predisposing factors [13,14]. Moreover addition of external pressure during the procedure has been advocated as a risk factor [12]. Tse et al. argue that even the position of the patient during the exam may affect the risk of rupture with major risk in supine position opposed to the left lateral that allows the spleen and its ligaments to be lax [15,16].

About 70% of reported cases presented within 24 h from endoscopy with sudden left-sided abdominal pain frequently associated with left-shoulder pain attributable to blood irritation of the left hemidiaphragm (Kehr’s sign) [13]. Significant decrease in haemoglobin and haematocrit level whenever associated with hypotension and tachycardia should raise the suspicion of intra-abdominal bleeding. In patients with a delayed presentation (more than 48 h) signs of splenic rupture are often subtle and nonspecific thus contributing in a delayed diagnosis.

Abdominal CT scan with intravenous contrast is the gold standard for diagnosis, defining splenic injury grading in accordance to the American Association for the Surgery of Trauma (AAST) (Table 1) [17]. Concomitant haemoperitoneum is sign of advanced, extremely unstable condition. Focused assessment with sonography for trauma (FAST) scan is a useful, easily available tool for detecting intraperitoneal fluid.

Depending upon hemodynamic status, splenic injury grading, associated injuries, and comorbidities, patients can be managed with observation, embolization, or surgery. In stable patients, a

Table 1
Splenic injury grading according to the American Association for the Surgery of Trauma (AAST), 2008.

Grade	Injury type	Description of injury
I	Hematoma	Subcapsular, <10% surface area
	Laceration	Capsular tear, <1 cm parenchymal depth
II	Hematoma	Subcapsular, 10% to 50% surface area; intraparenchymal, <5 cm in diameter
	Laceration	Capsular tear, 1–3 cm parenchymal depth that does not involve a trabecular vessel
III	Hematoma	Subcapsular, >50% surface area or expanding; ruptured subcapsular or parenchymal hematoma; intraparenchymal hematoma ≥5 cm or expanding
	Laceration	>3 cm parenchymal depth or involving trabecular vessels
IV	Laceration	Laceration involving segmental or hilar vessels producing major devascularization (>25% of spleen)
V	Hematoma	Completely shattered spleen
	Laceration	Hilar vascular injury devascularizes spleen

conservative approach may be adopted with transfusions, broad-spectrum antibiotics and intensive hemodynamic monitoring. Splenic artery embolization has been described in selected cases. Surgical approach with urgent splenectomy is the treatment of choice being the most frequent adopted option [18].

In the present case, the patient was treated with urgent splenectomy in accordance to AAST rules because of delayed presentation (>48 h), injury grading, and hemodynamic instability.

Overall mortality rate associated with such complication is about 5% with worse results in patients with a delayed presentation and treatment (more than 48 h) [9]. Prompt suspicion, early detection and treatment is the basis of better outcomes.

4. Conclusion

Despite its rarity, splenic rupture after colonoscopy should be taken into account as a possible life threatening complication after colonoscopy. Predisposing factors to such complication are well known but probably a standardised endoscopic scale for grading exam-related difficulty is advisable. Awareness of this potential complication, high level of suspicion and prompt treatment are at the basis of better outcomes in such patients.

Conflicts of interests

None.

Sources of funding

None.

Ethical Approval

Approved from the local ethical committee.
Final judgement: Approved.

Consent section

A written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Zappa M.A. and Porta A. contributed on the study concept or design, data collection, data analysis and data interpretation.

Aiolfi A. contributed on the study concept or design, data collection, data analysis, data interpretation and writing the paper.

Antonini I. and Musolino C.D. contributed on the data collection.

Guarantor

Zappa M.A.

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