CASE REPORT

Emergency splenectomy postelective colonoscopy

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SUMMARY

Colonoscopy is the gold standard for investigation of colorectal carcinoma and inflammatory bowel disease. Splenic injury is a rare but potentially fatal complication of colonoscopy. The present case study outlines the early clinical presentation and rapid deterioration of a patient with a splenic injury after an elective colonoscopy. A 70-year-old female underwent a colonoscopy for investigation of altered bowel habit. The procedure was documented as difficult due to the presence of 'stiff loopy colon'. In recovery, patient's condition deteriorated and she was moved to the ward for further assessment. She gradually became haemodynamically unstable and displayed signs of peritoneal irritation. Initial attempts of fluid resuscitation failed to improve patient's clinical condition. Further testing revealed a significant drop in haemoglobin and CT confirmed the diagnosis of a splenic rupture. She underwent an emergency splenectomy that evening. Postoperatively she was managed in the high dependency unit.

INTRODUCTION

Colonoscopies are being performed more frequently on a routine and red flag basis. The process of obtaining consent for these procedures usually outlines bowel perforation and haemorrhage as the main complications; these risks are documented as <0.1%–2.5% and 0.3%–2.1%, respectively.¹ Damage to visceral organs particularly the spleen is not as widely documented in the literature.

This case study illustrates the early clinical presentation of splenic rupture and the rapid deterioration that ensues following this complication. Early recognition of splenic injury after colonoscopy would lead to a focused examination and management plan and ultimately improve morbidity and mortality rates.

The ability to reflect and learn from a clinical scenario provides endless opportunities for future practice. Although the patient received the definitive treatment, failure of early recognition of the source of the problem could have resulted in a delay in her care. In order to ensure that future splenic injuries are managed in a timely fashion, clinicians and surgeons should have a high index of suspicion of splenic trauma in any patient presenting with severe abdominal pain and haemodynamic instability after colonoscopy.

CASE PRESENTATION

This 71-year-old female underwent a red flag oesophageal gastroduodenostomy (OGD) and colonoscopy on the 11 June 2016 following

attendance at a red flag general surgery outpatient clinic for altered bowels habit.

She had a past medical history of trigeminal neuralgia, fractured neck of femur and hypertension. Previous surgical operations included an appendectomy and open hysterectomy.

The colonoscopy was carried out by a consultant general Surgeon in a District General Hospital and noted to be difficult due to the presence of 'stiff loopy colon'. Three colonic polyps were removed and sent for histopathology. It was difficult to obtain proper positioning of the endoscope during the procedure but no obvious damage to bowel was noted. The patient started to complain of increasing left-sided abdominal pain at the end of the endoscopy and the procedure was terminated.

The abdominal pain increased incrementally in the recovery room and was out of keeping with typical insufflation pain. Blood pressure dropped and she was transferred to the ward for further assessment.

Postoperatively, the patient was assessed using the airway, breathing and circulation (ABCDE) approach. Oxygen requirements increased and she was placed on high flow oxygen. She became haemodynamically unstable, blood pressure failed to respond to fluid resuscitation and urine production was nil. Patient reported to be in severe abdominal pain and appeared pale. Shoulder tip pain was not reported. Intravenous morphine was required as analgesia. Intravenous antibiotics were administered as the patient fulfilled the sepsis criteria. On abdominal examination, signs of peritoneal irritation were observed without overt signs of upper or lower gastrointestinal tract bleeding. The exact diagnosis at this stage was uncertain and further investigations were required to illicit the cause of the patients' significant deterioration.

INVESTIGATIONS

All bloods were sent urgently including full blood count, liver function test, urea and electrolytes, coagulation screen and cross match. Due to the patients' falling oxygen saturations, an arterial blood gas (ABG) was performed. The haemoglobin was 69 on the ABG reading. This was an important turning point in the management of the patient as it illustrated the most likely source of injury.

Once she was stabilised, an urgent CT abdomen was performed to provide a definitive diagnosis.

The CT abdomen revealed a significant left upper quadrant haematoma with displacement of the spleen medially and active extravasation of contrast on the splenic capsule. The report concluded a significant splenic injury and free pelvic blood (figure 1).

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Figure 1 Coronal CT image of ruptured spleen with free fluid (see arrows). Kindly reported by Dr Rice, Consultant Radiologist.

The official haematology laboratory results revealed that her haemoglobin level had dropped from 114 precolonoscopy (12.30) to 55 postcolonoscopy (19.00). A significant loss of almost 6.5 units in 6 hours.

DIFFERENTIAL DIAGNOSIS

Initially, the clinical picture was that of haemodynamic instability, fever and peritoneal irritation. Therefore, bowel perforation and intra-abdominal sepsis were potential differential diagnosis. Fluid resuscitation and administration of broad-spectrum antibiotics covered for this possibility.

As oxygen saturations plummeted, a pneumothorax was a potential cause of hypoxia. High flow oxygen was applied and an ABG was analysed. The ABG revealed a type one respiratory failure with metabolic acidosis. The haemoglobin level was 69, a level that would not be in keeping with a pneumothorax. An erect chest X-ray was performed at the bedside which excluded a pneumothorax and did not reveal pneumoperitoneum.

As there was no evidence of external haemorrhage, a source of internal bleeding became the most likely diagnosis. The clinical picture of haemodynamic instability, pallor and low haemoglobin reinforced this and the CT confirmed intra-abdominal haemorrhage.

TREATMENT

Patient was resuscitated with blood products using the massive transfusion protocol. Four units of type specific blood were requested and two units of urgent group specific blood were also requested. Blood transfusions were erected but the patient continued to remain haemodynamically unstable. With the involvement of the anaesthetics team, she was rushed to theatre for an emergency laparotomy and splenectomy. Approximately 3 L of blood was lost intraoperatively.

In total, she received six units of packed red cells, four units of fresh frozen plasma and two units of platelets.

Postoperatively, she was monitored in the high dependency unit with a central line inserted for central venous pressure monitoring and an arterial line which allowed serial ABG measurements.

OUTCOME AND FOLLOW-UP

Despite developing acute respiratory distress syndrome postoperatively, she made a full recovery and was discharged 10 days postoperatively. After splenectomy, follow-up included administration of immunisations and lifelong antibiotic prophylaxis.

Histopathology reports from the colonic biopsies revealed a tubular adenoma with low-grade dysplasia and no other significant pathology. Surveillance for which involves five yearly colonoscopies.

DISCUSSION

Splenic injury is an infrequent complication of colonoscopy with an incidence of <0.02% cited in the literature.¹ The first report of splenic rupture postcolonoscopy was released in 1974²; Wherry and Zehner identified one case of splenic injury out of 247 colonoscopies. Since then over 100 case reports of splenic injury have been published internationally.³

In this case, the colonoscopy was performed by an experienced consultant general surgeon on a Saturday afternoon list. The procedure was difficult due to the presence of 'stiff loopy bowel' and navigation around the splenic flexure was documented as challenging. Polypectomy was performed, and biopsies were sent to histopathology. Patient presented with severe pain in the left upper quadrant and the procedure had to be terminated prematurely. Interestingly, some evidence suggests that polypectomy and biopsies are risk factors for splenic injury during colonoscopy.⁴

In the cohort of cases documented, the majority of patients were female and the mean patient age was 63.⁵ Clinical features usually presented <24 hours after colonoscopy, and some of these cases were discharged and re-presented to the emergency department.^{6,7} Similarly, the present case is female, in the same age bracket and presented <24 hours after colonoscopy.

The clinical presentation of left upper quadrant pain, tachycardia and hypotension are shared features in the literature.^{8,9} Kehr's sign (referred pain from phrenic nerve to shoulder tip caused by diaphragmatic irritation) though not elicited in this case is reported in up to 56% of cases of splenic injury.^{9,10} As splenic bleeding after colonoscopy can be life threatening, fluid resuscitation and early diagnosis is pivotal in the management of this potentially fatal complication.⁴ Once haemodynamically stable, urgent CT scanning should be arranged. CT is gold standard as its sensitivity and specificity for detection of visceral injuries have been quoted as high as 99% and 100% in one study.¹¹

Certain conditions such as splenomegaly and inflammatory bowel disease have been identified as potential risk factors in certain papers.^{12,13} Conversely, this has been disputed by other studies which reported no such data regarding these issues.⁴ The possible underlying mechanism of splenic injury involves traction on the splenocolic ligament, which can result in capsular tears and ultimately lead to a splenic rupture.^{6,13} Predisposing factors such as intra-abdominal adhesions from previous surgeries may lead to excessive traction on the splenocolic ligament.^{2,4,14} This can then result in avulsion of the splenic capsule and parenchymal disruption.⁴ Furthermore, excess external pressure to the left hypochondrium, direct trauma by the endoscope and a technically difficult colonoscopy are other risk factors to splenic trauma.¹⁵ Some of the literature suggests that positional manoeuvres such as lying in the left lateral position may reduce the risk of traction on the splenocolic ligament and thus decrease the risk of splenic injury.¹⁶

The grade of splenic injury and clinical status of the patient determines the ultimate management plan. Splenic trauma is universally graded according to the American Association for the Surgery of Trauma. Traditionally grades I–III can be managed conservatively whereas grades IV and V tend to be managed surgically.¹⁷ Open laparotomy and splenectomy is the most common surgical option for haemodynamically unstable

patients and was the surgical intervention of choice in this case. Three other treatment options include non-surgical conservative management, splenic artery embolisation by interventional radiologists and laparoscopic splenectomy. Splenic artery embolisation is a newer management option that has shown promising results in the literature although not widely available in every hospital.⁴ This endovascular approach has been documented to be more beneficial in stable patients with splenic injuries graded I–II.¹⁸ One successful case of laparoscopic splenectomy for traumatic splenic injury after screening colonoscopy has also been documented.⁷ These innovative minimally invasive management options may pave the way for the management of future splenic injury following colonoscopy.

Learning points

- Splenic rupture is a rare but potentially fatal complication of colonoscopy. Prevention of future splenic injuries during colonoscopy may not be attainable but generating an increased awareness enables earlier detection rates in the future. Splenic injury should be suspected in any patient who had a recent colonoscopy and presents with left upper quadrant pain, peritoneal irritation, haemodynamic instability and failure to respond to fluid challenge.
- Aggressive fluid resuscitation and circulatory support should be the mainstay of treatment in order to stabilise the patient prior to surgery/CT.
- If splenic injury is suspected, an abdominal CT should be performed in a timely manner as CT is the gold standard investigation.
- The definitive treatment approach depends on the haemodynamic status of the patient, the grade of injury assessed by imaging, patients' co-morbidities and availability of interventional radiology. Patients who are haemodynamically unstable with grades III–V splenic injury will most frequently require surgical intervention.

Contributors CC: responsible for collecting data (including patient and radiologist consent), literature review and writing of paper. JG: responsible for editing and supervising paper. GM: responsible for emergency splenectomy.

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