

## Splenic Rupture after Colonoscopy

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Colonoscopy is a safe procedure with minimal morbidity and anecdotal mortality. Complications are infrequent and consist mostly of intestinal hemorrhage and perforation (incidence of 1–2% and 0.2–1%, respectively) [1]. Uncommon complications have been reported, such as pneumothorax, pneumomediastinum, mesenteric tears, colonic volvulus and others. Rupture of the spleen is an exceedingly rare complication following colonoscopy and, though anecdotal, is potentially lethal. The first case was reported by Wherry and Zhener in 1974 [2]. Vigilance and a high index of suspicion could potentially save lives and minimize the morbidity associated with this rare complication, which can present from within several minutes to several days following the procedure.

We present a case of splenic rupture following routine colonoscopy, with weakness and light-headedness as the only symptoms, diagnosed 2 hours after completion of the procedure. To the best of our knowledge there are 19 reported cases in the English literature to date, with time from procedure to diagnosis ranging from several hours to days, making our case the quickest diagnosis reported.

### Patient Description

A 39 year old woman was referred to our emergency department from the gastroenterology clinic 1 hour after completing an uneventful diagnostic colonoscopy for evaluation of occasional rectal bleeding. Her medical history included a diagnostic laparoscopy for infertility workup 5 years earlier. During observation in the clinic she complained of light-headedness and weakness. Her heart rate was 100/minute, blood pressure 80/60 mmHg and O<sub>2</sub> saturation 97%. She was administered flumazenil and a 1 L fluid bolus, which failed to improve

her condition and she was transferred to the emergency department.

Upon arrival she was found to be very pale, with heart rate 105/min and blood pressure 75/40 mmHg. She complained of marked weakness but no pain whatsoever. Her physical examination was otherwise normal. Her hemoglobin was 7.9 g/dl (pre-procedural 12.5 g/dl) and white blood cell count 13,000 cells/mm<sup>3</sup>. Fluid resuscitation was initiated, and bedside sonography demonstrated free peritoneal fluid. She became hemodynamically unstable and was taken to surgery. Exploration showed free peritoneal blood and clots originating from a capsular tear in the superior aspect of the spleen, and a splenectomy was performed. A thorough exploration revealed no other pathology. Her postoperative course was uneventful and she was discharged home on postoperative day 4.

### Comment

Flexible colonoscopy is a safe procedure that is routinely used for diagnostic and therapeutic purposes. Complications are rare and consist mostly of hemorrhage and perforation [1]. Splenic injury following colonoscopy is a rare event. Moses and Leskovitz [3] reported a single case in 6,012 procedures. In our institution in the last 5 years, 6,814 colonoscopies were performed, with the reported case being the first splenic injury during this period.

The proposed mechanisms of splenic injury are: a) reduced mobility between the colon and the spleen, as with adhesions; b) excessive traction on the splenicocolic ligament with colonoscopic manipulations ("slide-by" advancement, "hooking" of the splenic flexure or external manual pressure); and c) transcolic pressure by the instrument. Both "difficult" (multiple biopsies/difficulty advancing the instrument)

and "easy" procedures, such as our reported case, have been implicated.

A summary of reported cases [Table] shows a slight predilection for older age, with our patient being one of only two under the age of 40. There is a female predominance (74%) and no increased risk with polypectomy. Symptoms usually began within 24 hours of the procedure but some patients were asymptomatic for 36–48 hours before onset of symptoms [Table]. Symptoms included abdominal pain, sometimes radiating to the left shoulder (Kehr sign), nausea, vomiting and weakness. Definite diagnosis was delayed by a few hours to as long as 10 days [4]. The case presented here is the only case without abdominal pain, as well the quickest to be diagnosed.

Laboratory results showed acute anemia (68%), leukocytosis (87%) and other signs of hemorrhagic shock, when present (acidosis, hypoxemia etc.). The diagnosis was made preoperatively in most cases (74%), utilizing computed tomography (9 cases) or ultrasonography (2 cases) [5] (one of these two cases is ours described in this report). The rest were diagnosed during surgery (6 cases) or autopsy (1 case).

The expected abdominal discomfort after colonoscopy (due to colonic distension) and the partial sedation routinely used hamper the clinician in interpreting patients' complaints. Since intraperitoneal blood does not cause peritonitis, diagnosis may be delayed until the patient manifests hemodynamic instability. In a patient with persistent post-colonoscopy abdominal pain and/or hemodynamic instability, perforation and mucosal hemorrhage should always be ruled out first before considering uncommon complications, like splenic tear.

The management of splenic rupture can

**Table.** Splenic rupture following colonoscopy: summary of reported cases

Author	Year	Age	Gender	Procedure	Onset of symptoms	Time to diagnosis	Diagnosis modality	Procedure	Course
Wherry	1974				No data available				
Telmos	1977	53	F	Colonos	< 24 hr	3 days	Angiography	Splenec	Uncompl
Ellis	1979	33	F	Colonos	4 hr	3 days	Laparatomy	Splenec	Uncompl
Casteli	1986	71	F	Colonos	24 hr	1.5 days	Laparatomy	Splenec	Uncompl
Reynolds	1986	76	M	Colonos	14 hr	< 1 day	Laparatomy	Splenec	Died
Doctor	1987	70	F	Polypec	–	< 1 day	Laparatomy	Splenec	Uncompl
Levine	1987	62	F	Polypec	6 hr	1 day	CT	Splenec	Uncompl
Tuso	1987	45	F	Colonos	< 24 hr	< 1 day	Laparatomy	Splenec	Uncompl
Gores	1989	60	F	Polypec	6 hr	< 1 day	Laparatomy	Splenec	Uncompl
Taylor	1989	62	F	Colonos	5 hr	10 days	CT	Non-op	Uncompl
Merchant	1990	66	M	Colonos	2.5 days	5 days	CT	Splenec	Uncompl
Rockey	1990	74	M	Polypec	< 1 day	8 days	CT	Non-op	Uncompl
		90	F	Colonos	6 hr	1.5 days	CT	Non-op	Uncompl
Colarian	191	82	M	Polypec	8 hr	–	Autopsy	–	Died
Org	1991	59	F	Polypec	< 24 hr	6 days	US	Splenec	Uncompl
Heath	1994	66	M	Polypec	36 hr	6 days	CT	Non-op	Uncompl
Espinal	1997	57	F	Polypec	10 hr	1.5 days	CT	Splenec	Uncompl
		60	F	Colonos	8 hr	< 1 day	CT	Splenec	Uncompl
Ahmed	1997	72	F	Polypec	2 days	3 days	CT	Splenec	Uncompl
Goitein	2003	39	F	Colonos	1 hr	2 hr	US	Splenec	Uncompl

(present report)

Colonos = colonoscopy, Polypec = polypectomy, US = ultrasound, Splenec = splenectomy, Non-op = non-operative, Uncompl = uncomplicated.

be operative or non-operative depending on the hemodynamic stability of the patient. Clinical judgment is crucial and standard surgical rationale applies. Four patients (26%) were managed non-surgically. All those who were operated on had a splenectomy. Splenic rupture can be a lethal complication. In the cases reported there were two fatalities (10%) – in one the diagnosis was made preoperatively and in the other it was made only at autopsy [Table]. Some risk factors have been implicated, such as prior abdominal surgeries, inflammatory bowel disease or pancreatitis, which mandate special care

during negotiation of the splenic flexure. As with other rare diagnoses, only awareness of the possibility, together with a high index of suspicion, will facilitate a correct and timely diagnosis of this rare complication.

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