

The Medicolegal Fallout From Laparoscopic Bowel Injury

BRIAN CAMAZINE, MD

context Laparoscopic bowel injury is a rare but potentially fatal complication of lower abdominal surgery, with an incidence of 1.3/1000. More than half these injuries are a result of electrocautery. In one study, 69% of the injuries were unrecognized at surgery. Overall, 58% of the injuries were to the small bowel and 32% were to the colon.¹ When diagnosis of a bowel perforation is delayed, sepsis, multiple operations, prolonged hospital stay, and death are known sequelae, as these cases illustrate.¹⁻³ □

CASE 1 | A general surgeon performed a laparoscopic cholecystectomy on a female patient with a history of multiple abdominal operations. Dense adhesions were encountered during the operation, which required lysis.

On postoperative day 1, the patient developed increasing abdominal pain, especially at the umbilical port site. On day 2, she developed leukocytosis, renal failure, and increasing nasogastric output.

Abdominal computed tomography (CT) on day 3 showed a moderate amount of free air. The surgeon and radiologist interpreted this as normal and secondary to the recent laparoscopy.

Progressive symptoms of sepsis and erythema around the umbilicus then ensued. A repeat abdominal CT on day 6 showed left subphrenic and a large anterior abdominal fluid collections, strongly suspicious for abscesses. Anterior abdominal wall subcutaneous emphysema and persistent pneumoperitoneum

were noted. The radiologist interpreted this as a bowel perforation.

The family requested transfer to a tertiary care hospital. There, the receiving surgeon performed a laparotomy, finding a perforated transverse colon. He did an extended right hemicolectomy with primary anastomosis. After a difficult postoperative course, the patient recovered.

The patient sued the first surgeon for negligence in 3 areas:

- Failing to convert to an open cholecystectomy when he encountered a hostile abdomen.
- Injuring the transverse colon during the lysis of adhesions.
- Failing to timely diagnose the colon perforation, especially in light of the misinterpretation of the CT findings.

VERDICT: This case is in litigation.

CASE 2 | A general surgeon performed a laparoscopic cholecystectomy on a man with a history of abdominal aortic aneurysm repair, lysis of adhesions, and 2 open incisional hernia repairs. The cholecystectomy was difficult due to multiple adhesions, and the surgeon placed a drain in the gallbladder fossa.

In 48 hours, the patient developed abdominal distension, sepsis, and multisystem organ failure.

Dr Camazine, a general surgeon and expert witness consultant, is assistant professor of surgery at Texas A&M Health Science Center and staff surgeon in general and thoracic oncology at the Central Texas Veterans Health Care System, Temple, TX. Cases in this column are also selected by the editors from Medical Malpractice Verdicts, Settlements & Experts, with permission of the editor, Lewis Laska, of Nashville, TN (www.verdictslaska.com).

Drain output went from serosanguinous to bilious.

On postoperative day 4, abdominal CT showed free intraabdominal air and extensive subcutaneous emphysema. The patient was transferred to a tertiary care hospital and had an exploratory laparotomy. The surgeon found a large enterotomy in the proximal jejunum and resected it. The patient died 3 days later.

The family sued the first surgeon claiming he was negligent in these 3 areas:

- Failing to convert to an open cholecystectomy when he encountered dense adhesions.
- Injuring the jejunum during the lysis of adhesions.
- Failing to timely diagnose the perforation, despite multiple indicators of an intra-abdominal disaster.

VERDICT: This case is in litigation.

EDITOR'S COMMENT | Laparoscopic bowel injury is not necessarily a complication of inexperienced surgeons. Experienced surgeons have accounted for more than 50% of these injuries, and may tend to operate under difficult circumstances with a high threshold of converting to laparotomy.^{3,4}

Instrument lacerations, trocar punctures, and cautery burns can cause laparoscopic bowel injuries.⁴ The ultrasonic dissector has a lateral energy dispersion less than that of cautery, but it can still cause transmural necrosis to major structures,⁵ especially at higher energy levels and longer activation times.^{6,7}

Because bowel injuries secondary to electrocautery or the ultrasonic dissector by nature tend to manifest after surgery, diagnosis is often delayed.⁴

PREVENTIVE MEDICINE | Many laparoscopic bowel perforations occur during adhesiolysis. A study comparing laparoscopic with open adhesiolysis found that 52% of laparoscopy patients required conversion to laparotomy.⁸ Perforations were twice as common in the laparoscopic group, and intraoperative bowel perforations were more frequent in patients who had 2 or more previous laparotomies. The authors recommended laparoscopic adhesiolysis in patients with fewer than 2 previous laparotomies.

Postoperatively, a high degree of abdominal pain at trocar sites is a key sign of laparoscopic bowel injury.^{1,9} Abdominal distention with nausea and vomiting is also a common sign. Sepsis sets in within 96 hours of surgery, so early diagnosis is critical.^{1,3}

Four Steps to Preventing Bowel Injury

P. Schrenk et al advised these steps to ensure the bowel remains intact during laparoscopy:⁴

1. Dissect adhesions between the bowel and the abdominal wall at their junction with the peritoneal peritoneum, not at the attachment to the bowel.
2. Do not force dissection of dense adhesions.
3. Carefully monitor the position and movement of all laparoscopic instruments. Do not manipulate them outside the visible field.
4. Prevent thermal burns by insulating all instruments down to their tips, using a low-power current, avoiding electrocautery close to the bowel, and using electrocautery only in direct contact with tissue.

Another key to avoiding bowel perforation during intraabdominal laparoscopy: Have an appropriate threshold for converting to an open procedure.

Laparoscopic bowel injury can be easy to diagnose with chest X-ray or CT. Free air after laparoscopic surgery may be normal, but it is uncommon and usually minimal. Finding superdiaphragmatic free air, particularly if moderate or greater in volume, can be diagnostic in patients with intense abdominal pain after laparoscopic procedures.⁹

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