

Laparoscopic Surgery for Adhesive Small Bowel Obstruction Is Associated With a Higher Risk of Bowel Injury

A Population-based Analysis of 8584 Patients

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Objective: We set out to compare the incidence of bowel repair and/or resection in a large cohort of patients with adhesive small bowel obstruction (SBO) managed operatively.

Background: Laparoscopic lysis of adhesions for adhesive SBO (aSBO) is becoming more common, yet might increase the risk of bowel injury given the distended and/or potentially compromised small bowel.

Methods: We used administrative discharge data derived from a large geographic region, identifying patients who underwent surgery for their first episode of aSBO during 2005 to 2014. Procedure codes were used to determine the exposure: either an open approach or a laparoscopic approach (including procedures converted to open). The primary outcome was incidence of bowel intervention, defined as intraoperative enterotomy, suture repair of intestine, or bowel resection. We estimated the odds of bowel intervention after adjusting for patient and clinical factors.

Results: A total of 8584 patients underwent operation for aSBO. Patients undergoing laparoscopic procedures were younger with fewer comorbid conditions. The rate of laparoscopic approaches increased more than 3-fold during the study period (4.3%–14.3%, $P < 0.0001$). The incidence of bowel intervention was 53.5% versus 43.4% in laparoscopic versus open procedures ($P < 0.0001$). After adjustment for potential confounders, the odds of bowel intervention among patients treated laparoscopically versus open was 1.6 (95% confidence interval: 1.4–1.9).

Conclusions: Laparoscopic procedures for aSBO are associated with a greater likelihood of intervention for bowel injury and/or repair. This increase might be due to challenges inherent with laparoscopic approaches in patients with distended small bowel. Surgeons should approach laparoscopic lysis of

adhesions with a higher level of awareness and use strategies to mitigate this risk.

Keywords: adhesion, adhesive small bowel obstruction, bowel injury, bowel resection, laparoscopy, small bowel obstruction

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Small bowel obstruction (SBO) is one of the most common reasons for admission to a surgical service in developed countries, accounting for 4% of all emergency admissions and up to 20% of surgical admissions for acute abdomen.^{1–3} In the United States, more than 350,000 adhesiolysis operations are performed annually, resulting in more than 960,000 days of care and \$2.3 billion in healthcare costs.^{4,5}

Approximately 75% of SBOs are caused by adhesions [adhesive SBO (aSBO)], many of which are formed after intra-abdominal operations.⁶ An estimated 20% to 30% of admissions aSBO are managed with surgical intervention.^{2,7,8} With the proliferation of laparoscopy and its increased use in acute care surgery, a growing number of patients treated operatively for aSBO undergo laparoscopic procedures.^{9–14}

Laparoscopic surgery for aSBO has many unique challenges, including the introduction of trocars into a distended abdomen and laparoscopic handling of distended small bowel. These challenges potentially increase the risk of bowel injury in patients undergoing surgery for aSBO. To test this hypothesis, we set out to compare the incidence of bowel injury and/or bowel resection in patients undergoing laparoscopic and open procedures for aSBO.

METHODS

Design

This is a retrospective population-based cohort study of patients who underwent operative management for aSBO between April 1, 2005 and March 31, 2014. We compared rates of intraoperative and perioperative events between patients who underwent laparoscopic procedures and those who underwent open procedures. The research ethics board at Sunnybrook Health Sciences Centre in Toronto, Canada, approved this study.

Data Sources

We used linked health administrative records for the province of Ontario, Canada. In Ontario's universally accessible healthcare system, data associated with all healthcare encounters for Ontario's 13.6 million residents are collected by the Ministry of Health and Long-term Care.

Data were obtained from the following sources: (1) Discharge Abstract Database—an administrative database that captures demographic, diagnostic, and discharge data, including the reasons for

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