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Small bowel obstruction in the virgin abdomen: the need for a mandatory laparotomy explored

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Abstract

BACKGROUND: A laparotomy is still considered mandatory for patients without previous abdominal surgery presenting with a small bowel obstruction (SBO) because of a perceived high incidence of underlying lesions. However, there is no evidence in literature to support this assumption. We analyzed the etiology of SBO in this subgroup of patients to establish the need for a mandatory laparotomy.

METHODS: A retrospective analysis was conducted over a 5-year period. Basic demographics, radiology results, operative findings, and outpatient investigations were analyzed.

RESULTS: Of 689 patients presenting with an SBO, a total of 62 patients, 9.0%, had a virgin abdomen. A known underlying disease (inflammatory bowel disease, malignancy) was the cause in 13 patients. The remaining 49 patients had adhesions in 75.5% and a newly diagnosed malignancy in 10.2% as a cause.

CONCLUSIONS: Adhesions are by far the most likely cause of SBO in patients without previous abdominal surgery followed by a small number of newly diagnosed malignancies. Both prevalences are in equal proportion to patients with previous abdominal surgery. A trial of nonoperative management may therefore be justified.

"Never let the sun set or rise on a small bowel obstruction (SBO)" is a surgical dogma which has been widely taught.[1–3] In more recent years, management has carefully shifted toward a nonoperative approach for patients with previous abdominal surgery in whom adhesions are considered the main cause for obstruction.[1,2]

However, a subgroup of patients presenting with SBO will not have had any abdominal surgery in the past (virgin abdomen) and in them a laparotomy is still considered mandatory by some large centers.[1,4] The underlying reasoning being that the SBO would likely be caused by an obstructive lesion.[1] There is, however, a paucity of evidence regarding the underlying causes of SBO in patients without previous abdominal surgery to justify any management protocol.

We therefore undertook a retrospect review of all our patients admitted with SBO and focused on the subgroup of patients with virgin abdomens to determine the causes of SBO, their prevalence, and the role of computed tomography (CT) of the abdomen in diagnosis and as a guide to operative management. We hypothesized that the need for a mandatory laparotomy in patients without previous abdominal surgery presenting with an SBO would be guided by the prevalence of the underlying etiologies and the ability of the CT-abdomen to identify these underlying causes.

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Methods

The Canberra Hospital is the only tertiary referral hospital in the Australian Capital Territory and surrounding New South Wales area and one of only 2 hospitals providing acute surgical care.

A retrospective analysis was conducted from January 1, 2007 to December 31, 2011. Patients were identified from the Medical Records Department by ICD-10 codes. The ICD-10 codes are applied throughout the entire admission, so both the initial working diagnosis on admission as the final diagnosis on discharge as any other additional diagnosis made during the admission are coded and recorded.

Included were all patients who presented to the Emergency Department with symptoms and signs of an acute gastrointestinal obstruction, were 16 years or older, had no previous abdominal surgery, and had a confirmed SBO on plain abdominal films or CT-abdomen. Patients with ileus, other forms of gastrointestinal obstructions (eg, colonic obstruction or incarcerated external hernia), or a past history of abdominal surgery were excluded.

A sudden onset of abdominal discomfort or pain with nausea and vomiting combined with distension of the abdomen and absent flatus was considered a typical presentation of a gastrointestinal obstruction.[5] Dilated loops of small bowel with air-fluid levels and an absent colonic gas pattern were considered as confirmation of an SBO by plain abdominal films.[1,5–8] An SBO on CT-scan would show dilated proximal small bowel, a possible transition point, and collapsed small bowel distally.[1,5,6] Previous abdominal surgery was defined as any operation that would have breached the peritoneum.

Since no guidelines exist regarding the management of an SBO in patients with a virgin abdomen, the management was at the discretion of the admitting surgeon. The absence of previous abdominal surgery and the assumption of underlying pathology might have favored an operative approach in these patients. Follow-up investigations were again at the discretion of the admitting surgeon, but again no standard recommendations exist. Being a retrospect study, the exact/in-detail reasoning for a final management approach was difficult to be extracted from the medical records.

Basic demographics of age and sex were collected for all patients admitted with SBO. Of the patients without previous abdominal surgery, medical history, radiology results, operative findings, pathology results, and results of further investigations following discharge were collected. The final diagnosis was primarily based on the operative findings. For nonoperated patients, the final diagnosis was based on the findings of all investigations. If no underlying lesions or other causes could be identified by any of the further investigations, by exclusion adhesions would be concluded.

The accuracy of the CT-abdomen was calculated by comparing the radiological diagnosis with the final diagnosis, either made at laparotomy or by further investigations.

Statistical analysis for basic demographics was performed using StatView 5.0.1 (SAS Institute Inc, Cary, NC). Statistical difference was computed for continuous data using the Mann–Whitney U test and the chi-square test and Fisher's exact test for categorical data. A P value of $<.05$ was considered statistically significant.

Medical ethical approval of this study was obtained from the Human Research Ethics Committee, ACT Government Health Directorate.

Results

From January 1, 2007 to December 31, 2011, 854 patients were identified by ICD-10 codes. An SBO was diagnosed in 689 patients. Of these 62 patients, 9.0% (62/689) of patients had no previous abdominal surgery and formed the study population.

The 62 patients consisted of 21 women and 41 men with a median age of 66 years (range, 18 to 91). Their median age was similar to the patients with previous abdominal surgery (66 years [range, 16 to 97]; $P = .621$), but men were more frequently represented (66.1% vs 49.0%; $P = .011$). A CT-abdomen was performed in 93.5% (58/62) of patients. A laparotomy was undertaken in 61.3% (38/62) of patients. Ischemic small bowel with the subsequent need for bowel resection was found in 5 patients. The final diagnosis of all 62 patients is presented in the flowchart (Fig. 1).

Etiology of small bowel obstruction

A previously diagnosed disease was identified to be the cause of SBO in 13 patients. In 7 patients, a known metastatic disease (colorectal cancer, $n = 4$; prostate cancer, $n = 1$; gastric cancer, $n = 1$; melanoma, $n = 1$) was the cause of the SBO; 3 patients required a laparotomy, 2 patients were palliated, and 2 patients recovered on nonoperative management. Of the 6 patients with known Crohn's disease, only 1 patient required an ileocecal resection, the others were treated medically.

In 49 patients, no previously diagnosed disease as a possible underlying cause for the SBO was present. A laparotomy was performed in 34 patients (69.4%).

Adhesions were the most common cause of obstruction in these 49 patients with a prevalence of 75.5% (37/49). In 25 patients, the adhesions were proven at laparotomy [adhesions at laparotomy 73.5% (25/34)]. An additional phytobezoar and small bowel volvulus were found during laparotomy in 2 patients, both unrecognized by CT-abdomen.

In the absence of a previous disease or any underlying pathology found on CT-abdomen or further investigations in 12 patients, the diagnosis of adhesions was made by