SMALL BOWEL OBSTRUCTION

SUMMARY

Small bowel obstructions have troubled patients and frustrated physicians for centuries. There has not been a true and reliable algorithm or definitive plan for management. In recent times with the advent of computed tomography to aid in the diagnosis, the outcome and clinical decision making process has become more accurate. Additionally, with advancements in operative techniques and imaging studies, treatment has since become more streamline. The data points to surgeons performing earlier operations which equate to better outcomes.

RECOMMENDATIONS

- **Level 1**
  - **All patients with suspected small bowel obstruction (SBO) should have a CT scan of the abdomen and pelvis with oral and IV contrast.**
  - **Non-operative management is acceptable in all stable patients.**
  - **Patients with SBO that have strangulated hernia, peritonitis, fever, leukocytosis, tachycardia, and or acidosis should undergo timely exploration.**
- **Level 2**
  - **CT scan findings that are suggestive of ischemia should prompt a low threshold to operate.**
  - **Water soluble contrast (Gastrograffin) should be considered if a patient fails to progress to normal bowel function after 48 hrs (i.e., consider small bowel follow through [SBFT]).**
  - **Complete obstruction demonstrated on SBFT requires surgical intervention.**
  - **Patients experience better outcomes with early versus late exploration.**
- **Level 3**
  - **Laparoscopic exploration may be considered a safe alternative to open exploratory laparotomy; however, patient selection and surgeon experience are determining factors.**
  - **Nasogastric tubes can be considered for decompression**.

INTRODUCTION

"Never let the sun rise or set on a bowel obstruction," was the motto preached to surgical residents a century ago, and these words still hold merit today. These words of wisdom may hold more truth than realized when they were originally spoken. In the modern era, there are several questions about adhesive small bowel obstructions (ABSO) that are under careful analysis and review. Several aspects of the care of these patients still plague surgeons today. When is the optimal time to operate? What patients require an operation? And what patients will gain the most benefit from non-operative management? Using the

EVIDENCE DEFINITIONS

- **Class I:** Prospective randomized controlled trial.
- **Class II:** Prospective clinical study or retrospective analysis of reliable data. Includes observational, cohort, prevalence, or case control studies.
- **Class III:** Retrospective study. Includes database or registry reviews, large series of case reports, expert opinion.
- **Technology assessment:** A technology study which does not lend itself to classification in the above-mentioned format. Devices are evaluated in terms of their accuracy, reliability, therapeutic potential, or cost effectiveness.

LEVEL OF RECOMMENDATION DEFINITIONS

- **Level 1:** Convincingly justifiable based on available scientific information alone. Usually based on Class I data or strong Class II evidence if randomized testing is inappropriate. Conversely, low quality or contradictory Class I data may be insufficient to support a Level I recommendation.
- **Level 2:** Reasonably justifiable based on available scientific evidence and strongly supported by expert opinion. Usually supported by Class II data or a preponderance of Class III evidence.
- **Level 3:** Supported by available data, but scientific evidence is lacking. Generally supported by Class III data. Useful for educational purposes and in guiding future clinical research.

literature as a guide to evidence based medicine, certain practices can help surgeons answer these challenging questions.

LITERATURE REVIEW

Imaging Modalities

Level II and III data illustrates that CT scans with contrast are superior to radiographs in the diagnosis of SBO. CT scans have an accuracy of 83-94%. A critical finding in CT images that help to facilitate an accurate diagnosis of SBO include a clear transition point. This is a finding in which the proximal lumen of bowel is dilated and the distal portion is collapsed. Additionally, if there is failure of intraluminal contrast to progress through the lumen at the transition point or the colon is completely decompressed, this also suggests the presence of SBO. These two radiographic findings together may be indicative of a high-grade obstruction. Plain radiographs of the abdomen and pelvis are neither sensitive nor specific for obstruction.

Operative versus non-operative management

Retrospective data suggest that 60-80% of all ASBOs will respond to non-operative management. Non-operative management is defined as:

1. Nasogastric tube decompression
2. Fluid resuscitation
3. NPO (nothing by mouth)
4. Serial abdominal exams

The difficult question to answer is which patients will fail non-operative management. This is of particular importance because multiple studies have shown that delays in operative treatment lead to increases in mortality and complications. In a prospective study by Texiera et al., if surgery was delayed by 72 hours, there was a three-fold increase in mortality and a two-fold increase in infectious complications.

In order to elicit which patients will fail non-operative management, several prospective and retrospective studies have outlined factors that predict high probability of treatment failure. In a large prospective trial, Biondo et al randomized two arms of patients both undergoing non-operative management of ASBO. One arm was to receive Gastrograffin (100mL) if they failed to resolve within 48 hours, while the other arm would not receive the dose of Gastrograffin. At the conclusion of the study there was 85% resolution of the ASBO in the Gastrograffin arm with early operation on those that did not have progression of Gastrograffin into the colon within 24 hours. In the other arm there was a 55% operative rate with increased length of stay and complication rate. The study had no mortalities.

Galardi et al also showed that Gastrograffin studies (small-bowel follow through) allowed for a shorter time to diagnose complete bowel obstruction. This identified those that needed operative intervention earlier. Additionally, the patients that received Gastrograffin were more likely to be successfully managed with non-operative management. The authors postulated that Gastrograffin acts both as a pro-kinetic and as an osmotic agent, drawing water intraluminally from the bowel wall, reducing the edema and helping propel contents forward. Normal transit time to the colon should be approximately 3 to 6 hours.

The conclusions that can be extrapolated from the current literature is that SBFT seems to be a more definitive assessment of whether a SBO will resolve on its own or if operative intervention will be necessary.

The literature also agrees that if intervention is needed, early intervention is superior to delayed treatment. This fact was validated by Schrafinajel et al. who looked at 27,046 patients and concluded that those who underwent delayed treatment had worse outcomes. Once operative intervention has been chosen, there is a body of literature that shows laparoscopic exploration is a safe alternative to open laparotomy. The caveat is that patient selection, the difficulty of the operation, and surgeon's skill level all play an integral role in the success of the procedure. Joseph et al showed in retrospective analysis that

early operation less than 48 hours with a laparoscope had a more rapid return of bowel function and decreased complication rates when compared to open exploratory laparotomy.

Kelly et al showed in a retrospective analysis that there was a decreased hospital length of stay and decreased complication rate for patients who underwent laparoscopic surgery for ASBO. This study included 9,000 patients, but only 14.9% were operated on laparoscopically.

Surgical Management

Any patient who has a strangulated hernia, peritonitis, tachycardia with acidosis, and an obstruction requires timely operative intervention. All authors agree on this topic. This patient population does not need an algorithm, and they are immediately deemed candidates for an exploratory operation in a timely manner.

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Primary Author: Paul Wisniewski, DO; Alvin T. de Torres, MD; Michael L. Renda, DO; Lilly A. Bayouth, MD.
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Please direct any questions or concerns to: webmaster@surgicalcriticalcare.net