

Systematic review of surgical management of Acute Mechanical Small Bowel Obstruction

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Abstract: Small bowel obstruction (SBO) occurs when the normal flow of intestinal contents is disrupted. The management of bowel obstruction relies on the etiology, intensity, and area of the obstruction. Severe intestinal blockages prevail incidents amongst patients with shared pelvic and stomach malignancies. This systematic review aimed to focus on the surgical management of mechanical small bowel obstruction, and to overview the different surgical procedures for SBO and evaluate their benefits through choosing evidence based studies. A computerized search of the National Library of Medicine MEDLINE database was undertaken using the PubMed Enters interface. English language citations during the period of 1980 through October 2016 using the primary search strategy, we then searched other two bibliographic databases. Further searching was from references from three standard textbooks and citation tracking of all relevant reports found using the Science Citation Index. The references of all relevant reports and review articles were searched for additional trials. Evaluation and management of SBO continue to evolve with advances in medical technology and techniques. Since the publication of the EAST practice management guideline on SBO in 2008, there has been increased support for the use of CT scans to confirm the diagnosis of SBO and assist in determining the initial clinical management. Minimally invasive surgery is being used with increasing frequency and in more complex cases.

Keywords: surgical management, Small bowel obstruction.

1. INTRODUCCION

Small bowel obstruction (SBO) occurs when the normal flow of intestinal contents is disrupted. The management of bowel obstruction relies on the etiology, intensity, and area of the obstruction. Severe intestinal blockages prevail incidents amongst patients with shared pelvic and stomach malignancies (1). Severe mechanical bowel obstruction is a typical surgical emergency situation and a regularly come across issue in stomach surgery (2,3). It makes up a significant reason for morbidity and monetary expense in healthcare facilities worldwide (4) and a considerable reason for admissions to emergency situation surgical departments (3,5). Intestinal obstruction comes from extremely extreme conditions, needing a right and fast medical diagnosis along with instant, logical and efficient treatment (6,7). Bowel obstruction may be *functional*, due to bowel wall or splanchnic nerve dysfunction, or *mechanical*, due to a mechanical barrier, the causes behind that summarized in (TABLE1) (4). In small bowel obstruction the normal mechanisms of intestinal absorption are jeopardized, so an excess of fluid loss takes place. Throwing up, bowel wall edema and transudation into the peritoneal cavity are present, whereas in the later phases venous pressure increases with following bleeding into the lumen and irritation of hypovolemia (8).

Bowel obstruction might be total or partial, basic or complex. Partial obstruction permits some liquid contents and gas to go through the point of obstruction, whereas total obstruction hinders passage of all bowel contents. Unlike easy obstruction, made complex obstruction shows compromise of the flow to a sector of bowel with resultant anemia, infarction, and perforation (9).

The basic treatment for SBO is expeditious surgery. The reasoning for this method is to decrease the danger for bowel strangulation, which is connected with an increased danger for morbidity and death. The literature would recommend that medical indications supported by easy imaging research studies can recognize the large bulk of patients providing with surgical SBO (10,11). Early personnel intervention in patients with fever, leukocytosis, peritonitis, tachycardia, metabolic acidosis, and constant pain will determine strangulation 45% of the time (12,13,14). Total SBO needs to be run on early

as the main mode of treatment. Research studies would recommend that 31% to 43% of patients with total SBO or peritonitis will deal with without needing some type of bowel resection (12,15). Other reported advantages of the personnel management of SBO is the description by class II information that reports lower reoccurrence rate and longer illness totally free periods with operative intervention when compared with conservative management (16,17,18).

The goals of initial management are to relieve discomfort and restore normal fluid volume and electrolytes in preparation for possible surgical intervention. High-quality data to guide management of SBO are sparse, and clinical practice is highly variable; however, guidelines based upon the available evidence are available from the Eastern Association for the Surgery of Trauma (EAST) (19), and from the World Society of Emergency Surgery (Bologna guidelines). The latter focuses on the management of adhesion-related small bowel obstruction (20,21).

TABLE 1: Etiology of acute Mechanical small bowel obstruction (4)

Mechanical SBO:	
Luminal	1. Gallstone ileus: 1–2% of mechanical obstructions and 25% of obstructions in elderly. 2. Neoplasm 3. Bezoar
Mural	1. Meckel's diverticulum: mechanism of obstruction: <ul style="list-style-type: none"> • Volvulus (twist around mesodiverticular or omphalomesenteric band) • Intussusception (initiated by inverted diverticulum) • Stenosis from adjacent ileal ulcer 2. Crohn's disease: mechanism of obstruction:

This systematic review aimed to focus on the surgical management of mechanical small bowel obstruction, and to overview the different surgical procedures for SBO and evaluate their benefits through choosing evidence based studies.

2. METHODOLOGY

Design:

We conducted a systematic review study according to the guideline of review.

Process stratgy:

A computerized search of the National Library of Medicine MEDLINE database was undertaken using the PubMed Enters interface. English language citations during the period of 1980 through October 2016 using the primary search strategy ,we included the following top-level search terms and phrases in our strategy:: “Intestinal obstruction, ” “intestine”, “small”, “gastrostomy,” “resection,” “bypass,” “ileostomy,” “colostomy,” “obstruction,” “surgical stoma,” “stoma,” “surgery,” “surgical,” “pelvic neoplasms,” “peritoneal neoplasms,” “gastrointestinal neoplasms,” “pancreatic neoplasms,” and “intestinal obstruction/surgery,”. we then searched other two bibliographic databases. Further searching was from references from three standard textbooks and citation tracking of all relevant reports found using the Science Citation Index. The references of all relevant reports and review articles were searched for additional trials.

Case reports articles were also excluded. The PubMed Related Articles algorithm was also employed to identify additional articles similar to the items retrieved by the primary strategy. Of approximately, 350 articles identified by these two techniques, those dealing with either prospective or retrospective studies examining SBO were selected.

3. RESULTS AND DISSCUSION

Mechanical bowel obstruction is an old and common surgical emergency (2,3). As many studies stated that immediate and correct diagnosis of this condition and its etiology is necessary, and proper treatment is of utmost value (6,7,22,23,24). The scientific image, nevertheless, of these clients (7,25,26) in addition to the etiology of obstruction(2,4,24,27,28,29), while suitable management stays questionable (19,30). We, for that reason, performed this methodical evaluation research study to determine and evaluate the proper surgical methods with severe mechanical bowel obstruction, the etiology of obstruction along with management and result of these Patients. We first included nine studies (31-39) concerning MBO surgical interventions were included in our systematic reviews which is the most common cause of acute mechanical SBO. There were eight retrospective studies, and one was prospective cohort with poor follow up. Only three of the

included studies identified confounders and used adjustments for confounders in their study. Only three studies provided a disclosure for a funding source.

Quantitative Findings The characteristics of the nine studies are included in (TABLE 2). All five articles that could be quantitatively synthesized were observational studies. These studies included 313 patients with MBO, of which 249 (79.5%) presented with PC. The mean age was 61.4 (range, 51–67) (Table II). OS for surgical patients was 6.4 months (2.8–19.7, n¼ 190, 3 studies) (Table II). When stratified for surgical technique, the survival for patients that underwent resection, colostomy, and bypass were 7.2 months (n¼ 174, 3 studies), 3.4 months (n¼ 9, 1 study), and 2.7 months (n¼ 7, 1 study), respectively. Major complications occurred in 37.0% of patients that underwent resection (TABLE3). Major complications occurred in 37.0% of patients that underwent resection (n¼ 94, 2 studies).

TABLE 2: Characteristics of Study Populations Included in the Systematic Review Along With Details of Surgical Interventions Utilized in the Respective Studies

Source	Sample Size	Mean Age in Years	Etiology	Patients with peritoneal carcinomatosis (%)	Surgical intervention of interest (n)
Higashi et al. (31)	21	61.7 (20–88)	Colorectal	100	Bypass (9), resection (1), colostomy (7)
Costi et al. (32)	31		Colorectal	100	Resection (15), non-resective surgery (16)
Abbas et al. (33)	79	62 (19–91)		100	Resection (79)
	31	62	Colorectal	100	Resection (31)
	16	51	Melanoma	100	Resection (16)
	19	58	Gynecological	100	Resection (19)
	13	67	Other	100	Resection (13)
Amikura et al. (34)	51	–	Gastrointestinal	100	Bypass, resection, enterostomy (51)
Lee et al. (35)	73	62 (29–88)	Colorectal	20	Resection, bypass (-73)
	71	64.14 (26–87)	Colorectal		Stenting (71)
Chakraborty et al. (36)	35	61 (19–85)	Multiple	43	Bypass (3), resection (3), colostomy (5), adhesiolysis (1)
Parveen et al. (37)	30	–	Ovarian	40	Bypass (7), resection (10), colostomy (3), adhesiolysis (14)
Kim et al. (38)	69	55 (20–86)	Gastric	93.30	Bypass (69)
	111	59 (26–88)			Stenting (111)
Wong and Tan (39)	27	69 (28–85)	Multiple	92.50	Bypass (14), resection (6), colostomy (5), adhesiolysis (2)

TABLE 3. Baseline Demographics and Primary and Secondary Outcomes Associated with Surgical Interventions Studied

Outcome	Bypass (n¼ 7)	Resection (n¼ 174)	Colostomy (n¼ 9)	Stenting (n¼ 182)	Overall (n¼ 372)
Mean age (range) in years	63.1 (61–64.5)	61.0 (51–67)	64.0 (61.7–64.5)	61.0 (59–64.1)	61.4 (51–67)
Male%	–	54.8%	48%	50.5%	51.7%
Median survival, months	2.7	7.2 (3.5–19.7)	3.4	10.8 (8.5–13)	7.1 (2.7–19.7)
ECOG baseline%	–	–	–	52%	52%
Mean hospital length of stay, days	–	–	12	14.4 (13.2–15.5)	13.6 (12–15.5)
Time to chemotherapy, days	–	–	–	16.2-	16.2

Other included studies in our review, a recent meta-analysis (40) of bowel obstruction in patients has suggested that resection and primary anastomosis has the greatest operative survival (7.2 months) followed by defunctioning stoma development (3.4 months) and enteral bypass (2.7 months) (40). Significant issues took place in 37.0% of clients that went through resections. This latter point is necessary, as while durability is preferable, lifestyle need to be thought about vital in clients with a restricted life span. No evaluation was made from lifestyle in the evaluated research studies. It is likewise essential to keep in mind that a single level of obstruction is most likely to be open to resection and anastomosis, so this result advantage might show the relative seriousness of intra-abdominal illness. When any surgery is being carried out, it should be remembered the recurring length of working intestinal tract that will be left in connection. It is usually thought about that 200 cm of small bowel in seclusion is the minimum length able to keep appropriate function, or 50-- 70 cm of small bowel when the colon is still in connection (41). Lengths listed below this are connected with substantial physical and mental sequelae (42). Probability of fistulation or adherence to other soft tissues or stomach organs need to likewise be examined when evaluating clients for surgery, as exenterative surgery or en bloc resection with significant restorations are not likely to benefit this mate of clients. Intraoperative tumour debulking is not of advantage in non-gynaecological malignancies (43).

The procedure of surgical decision-making trusts an evaluation of the most likely advantages and threats of the proposed treatment to the patient. This balance ends up being rather harder to translate in sophisticated malignancy, especially when the advantage of the treatment might be connected to just a boost in the lifestyle, with high personnel dangers of morbidity and death (44). Broadly, factor to consider for palliative surgery in MBO need to be given up circumstances where the clients are not actively passing away, and turnaround of enteral failure might make healing alternatives feasible (40). Clear interaction with the patient, caretakers and the multidisciplinary group is most likely to be the most rewarding, and the least most likely to be impacted by a single celebrations program. Completion of life is obviously a mentally terrible time for all included, however the patient is possibly under a wide variety of impacts, which might cloud judgement consisting of opiates, steroids, biochemical imbalance, pain or pre-existing psychological health concerns. Anecdotal proof exists of clients intending to reduce or end their lives by going through intrusive treatments, and undoubtedly of maleficent family members with ulterior intentions. Usually, nevertheless, loved ones are simply worried that 'whatever possible must be done' for the patient (45). Clear evaluations have to be made from the patient's understanding of the possible results, and most likely advantages of personnel intervention (46).

Laparoscopic Operative Approach :

Successful laparoscopic surgery for bowel obstruction is being reported with greater frequency. Reported data suggest that up to 60% of SBO cases brought on by adhesions might be open to laparoscopic treatment (47). The reported conversion rate is 20% to 51.9% (47-55) and the issue rate (bowel injury) is 6.5% to 18.0% (47,48). Conversion to open treatment have actually been reported secondary to density of adhesions, failure to repair the obstruction, reason for obstruction not open to laparoscopic treatment, intestinal necrosis, and intestinal perforation. Elements that prefer laparoscopic success are SBO postappendectomy, with bands as cause, with less than 2 previous operations, and much shorter time of signs (50). When the surgery is directed by preoperative enteroclysis (56), it has actually been reported that conversion rate can be reduced to as low as 6.9%. The laparoscopic treatment of SBO seems efficient and results in a much shorter healthcare facility remain in an extremely chosen group of clients (50,58). There has actually likewise been literature to support that clients treated with laparoscopic intervention have lower hernia rate and SBO however need the very same quantity of personnel intervention (58). Clients fitting the requirements for factor to consider of laparoscopic management consist of those with (A) moderate stomach distention enabling appropriate visualization, (B) a proximal obstruction, (C) a partial obstruction, and (D) an awaited single-band obstruction. Presently, clients who have actually advanced, total, or distal SBOs are not prospects for laparoscopic treatment. Unfortunately, the majority of patients with obstruction are in this group. Similarly, patients with matted adhesions or those who remain distended after nasogastric intubation should be managed with conventional laparotomy.

4. CONCLUSION

Early operative management should be pursued in patients with suspected bowel strangulation because this is associated with an increased morbidity and mortality. Clinical indicators, which include fever, leukocytosis, tachycardia, continuous pain, metabolic acidosis, peritonitis, and the systemic inflammatory response syndrome (SIRS).

Evaluation and management of SBO continue to evolve with advances in medical technology and techniques. Since the publication of the EAST practice management guideline on SBO in 2008, there has been increased support for the use of CT scans to confirm the diagnosis of SBO and assist in determining the initial clinical management. Minimally invasive surgery is being used with increasing frequency and in more complex cases.

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