

Intestinal Obstruction as a Postoperative Complication, A Narrative Review

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Abstract

Post-operative bowel obstruction, whether functional or mechanical, was a frequent and serious issue that may prevent the resumption of bowel movement and is a major cause of prolonged hospital stays and growing healthcare costs. Numerous different aetiologies are taken into account, even though adhesions are the primary cause of SBOs in the early postoperative period. This review explains the EPSBO condition, describes its unique clinical characteristics, and provides a balanced diagnostic and restorative approach. Post-operative intestinal barriers may even increase the risk of patient illness and mortality following abdominal surgery, according to past studies. Post-operative bowel blockage can be categorised according to how long it has been since the initial surgery. It was clear that the earliest intestinal obstruction following surgery occurred within the first 30 days. If a patient is unable to eat, pass gas, or empty their bowels within five days of having a laparotomy, they are said to have a persistent ileus or EPSBO. The absurdity The obstacle is the more likely diagnosis if the patient has previously discharged flatus or faeces and is still doing so.

Keywords: Intestinal obstruction, Surgical complications, Small intestine, Small bowel obstruction, EPSBO

INTRODUCTION

Early post-operative small bowel obstruction (EPSBO), which is frequently difficult to identify from the ileus, is a unique clinical entity that is typically characterised as a barrier developing within the first 30 days after surgery. When compared to simple bowel obstruction (SBO) in individuals who do not require intraperitoneal hospitalisation and adhesive SBO that develops at a later stage, EPSBO's pathogenesis, diagnosis, and organisational structure are distinct in a number of ways [1, 2]. Numerous different aetiologies are taken into account, even though adhesions are the primary cause of SBOs in the early postoperative period. This review explains the EPSBO condition, describes its unique clinical characteristics, and provides a balanced diagnostic and restorative approach [3, 4].

Mechanical or functional post-operative intestinal barriers were a common and serious consequence that could impede the return of bowel function, lead to extended hospital stays, and drive up medical expenses. According to prior research, patients who have had stomach surgery may even experience an increase in mortality and indisposition due to post-operative bowel obstruction [5, 6]. The strength of the post-operative intestinal blockage is categorised based on how long it has been after the initial surgery. Within the first 30 days following surgery, the first post-operative bowel barrier was considered to have occurred [7]. After the colorectal surgery, Edna *et al.* discovered a 9% frequency of post-

operative minor intestinal blockage [4]. In an abdominal hospital, powered obstruction from grips or paralytic ileus were the two causes of post-operative intestinal obstruction [5].

75% of the reasons of colonic obstruction, ongoing pelvic pain, and infertility in females who have had prior abdominal surgery are adhesions. According to estimates, more than 300,000 individuals get operations each year in the United States to cure small intestine obstructions, which is encouraged by adhesions. As a result, more individuals are being hospitalised as a result of this problem after receiving medical treatment as a first line of defence. Anti-inflammatory drugs, antibiotics, biochemical agents, and physical barriers are only a few of the substances that have

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been tried to inhibit adherence; sadly, none of them have been successful [8, 9].

Any location along the digestive system is susceptible to obstruction. The most important thing is to make an accurate diagnosis and to treat the patient with the utmost precision. Constipation, nausea, and stomach pain associated with colic are typically caused by intestinal blockages. The causes of intestinal obstructions are numerous [10, 11]. The need for patients to stay in the hospital and mechanical obstructions caused by adhesions are considerably reduced by surgeons. Conservative techniques can work if there isn't a surgical backup indication. Patients need to be moved around as soon as possible, and fluid-electrolyte balance needs to be corrected and continuously monitored [12, 13]. Using multivariate numerical approaches, the factors impacting challenges and fatalities following procedures for small bowel obstruction (SBO) were investigated. It is thought that circumstances like old age, comorbidities, intestinal gangrene, and delay in treatment make death after surgery for SBO unfair. There is no known training in which risk factors for death and difficulty have been carefully investigated using contemporary mathematical methods [14].

In children, as in adults, PIO is frequently caused by adhesions. The frequency in the pediatric population ranges from 2.2 % to 2.8 % [15, 16]. In its first stages, PIO in children can be accomplished conservatively [17]. Ultimately, 40 % to 60 % will require sympathetic surgical intervention [16, 18]. Even additional adhesiolysis delay has been reported to increase morbidity [19]. However, a laparoscopic tactic would be expected to be associated with cut adhesion formation and, subsequently, a reduction in PIO. To our knowledge, there are scarce pediatric reports in the prose that assess the incidence of post-operative paste bowel obstruction and compare the possible risk for re-operation among laparoscopic and exposed operations.

Pathophysiology and Causes

Inflammation

An intra-abdominal edoema or phlegmon are examples of local inflammatory grazes that may stick to the small bowel, which is crucial to EPSBO. These "septic" or "inflammatory" adhesions were the cause of EPSBO in three of 41 and 4% [10] of patients, respectively. In a different order, 12 of the 26 patients with EPSBO had an intraperitoneal abscess [11]. However, with such luggage, it is impossible to determine in retrospect whether the obstructing process was paste or paralytic (ileus) [20, 21].

Adhesions

The majority of EPSBO episodes dissolve on their own and are most likely brought on by adhesions. In two separate sequences, 91% [5] and 92% [8] of patients who underwent necessary surgery had adhesion as the aetiology of the obstruction. Peritoneal infection and pollution are the main

causes of adhesions following any surgical peritoneal damage. This causes an inflammatory reaction, the initiation of complement and coagulation cascades, and the exudation of watery fluid that is high in fibrinogen. Fibrin is produced when thrombin converts fibrinogen, and it adheres to nearby injured surfaces. If fibrin is not broken down at this stage, fibroblasts spread throughout the matrix and collagen synthesis takes place, changing the fibrinous unions to fibrous unions [1, 6].

Herniation Within

Any internal flaw has the potential to result in EPSBO through an internal herniation. The small bowel may herniate finished, resulting in EPSBO, once a mesenteric or omental defect is established, or an opening is left in the "gutters" behindhand a colostomy or enterostomy [2]. Any internal flaw has the potential to result in EPSBO through an internal herniation. The small bowel may herniate finished, resulting in EPSBO, once a mesenteric or omental defect is established, or an opening is left in the "gutters" behindhand a colostomy or enterostomy [3, 4].

Other Factors

Intussusception and a duodenal haematoma in the intramural region are two other unusual causes. 6,8. Without a clear "leading point," post-operative duodenal intussusception may develop and may be linked to a longer healing phase and post-operative ileus [12]. It appears to be more prevalent following paediatric procedures, whether or not there is an essential point; an upturned appendicular stub following appendectomy may also indicate the latter [13].

Risk Factors

The recovery of bowel function could be hampered by post-operative intestinal obstruction, either mechanical or functional, which could lead to extended hospital stays and rising medical expenses. Post-operative intestinal barriers have been shown in prior research to even increase mortality and damage in individuals who have undergone abdominal surgery [1, 2]. Depending on how long after the primary operation they were, post-operative intestinal obstructions can be categorised. It was evident that the early postoperative intestinal obstruction happened within the first 30 days following the operation [3]. According to Edna *et al.*, 9% of colorectal surgery patients experienced postoperative small intestinal obstructions [4]. Either mechanical blocking from adhesions or paralytic ileus after stomach surgery were the causes of postoperative intestinal obstruction [5].

Age, female, ASA status, [22] number, and places of prior procedures were the only preoperative risk factors that did not change ($n = 7$) according to a classification previously established [23]: Abdominal organs, mid and hindgut (abdominal wall, small intestine, appendix, rectum, colon), and female reproductive system. The length of time between the most recent procedure and the enclosure glue post-operative SBO operation were two other well-known facts.

Diagnosis

A tenacious ileus or EPSBO is indicated if the patient is unable to eat, pass gas, or empty the bowel within five days of a laparotomy. If the patient has previously passed flatus or stool and then surfaces to do so, the barrier is the more likely diagnosis. However, the patient frequently makes a full recovery on their own without the cause being identified. Abdominal imaging must next be carried out in order to determine the issue's root cause and formulate a plan of action [7].

Complications Following a Procedure

Internal Hernias

The flange of the viscera over a normal or pathological peritoneal or mesenteric orifice inside the peritoneal hollow is what is known as an internal hernia (IH) [24, 25]. Both genetic and acquired hernias are possible. Paraduodenal (53%), transmesenteric hernias (8%), and pericecal (13%) hernias through the foramen of Winslow (8%), and intersigmoid hernias (6%) are the main orderings of internal hernias [24, 25].

Prison and Closed-Loop Bowel Blockage

A type of mechanical duodenal blockage known as a closed-loop intestinal barrier or imprisonment occurs when a piece of bowel is blocked at two different points along its length, nearly often next to one another [26].

External Hernias

An incisional hernia is a type of external hernia brought on by a surgical wound that has partially closed. Typically, peritoneal fat protrudes through the hernial defect with or without the inclusion of intestinal loops.

Adhesions

Funiculate formations known as adhesive bands are formed between the peritoneum of tissues and organs, frequently as a result of trauma sustained during surgery. They are gathered from fat deposits and soft fibrous tissue [27].

Afferent Loop Syndrome

When combined with Billroth II operation and Whipple or Roux-en-Y operation, afferent loop condition (ALS) symbolises the mechanical obstruction of the afferent loop and occurs in 0.3–2% of gastroenterostomies [28-30].

Anastomotic Strictures

Anastomotic strictures might occur more frequently or less frequently depending on the hospital setting. The stricture's origins have not yet been fully defined [31].

Problems Brought on by Illness

Repeated Neoplastic Growth

Many months or even years after the operation, a tumor's recurrence may be the source of obstruction.

As it clearly demonstrates an ornamental mass or an asymmetric wall-thickening adjacent to the location of the first excised growth, CT is the modality of choice in this situation [32]. Return of inflammatory bowel disease.

Crohn's Disease

The majority of Crohn's disease (CD) patients eventually need surgery, and they are susceptible to relapses at any location in the GI tract, whether near the intestinal anastomosis or far from it. These relapses may involve sores, fistulae, or new strictures in the body [33].

Most Common Ways to Prevent Intestinal Obstruction as a Post-Operative Complication

Every preventive measure must be risk-free, efficient, workable, and profitable. Although combining preventative strategies can increase their effectiveness, there isn't much information available to the general population.

Wound Closure

Fascia, hypodermic fat, and skin are the coverings to take into account during mid-line wound closure. Numerous research on the ideal fascia conclusion for laparotomy have been conducted.

Surgical Technique

The laparotomy approach should be compared to laparoscopy first. Because less peritoneum stress occurs during laparoscopy, it is thought to lessen the formation of devotions. Laparoscopy and laparotomy are comparable to colorectal surgery according to two acknowledged possible randomised trials on post-operative obstructions [21]. The sum of the studies revealed no alteration in the level of post-operative blockage. The highest blockage rate was seen in topics needing conversion in Taylor *et al.* study, which followed-up on the CLASICC trial topics.

Gels

SprayGel is a polymerizable gel that, when applied, endures for 5-7 days. It is a more viscous Adept solution designed to promote better wall-to-adherence development. A pointless randomised experiment using ring ileostomy closure was conducted. SprayGel was connected to a group that didn't care about the anti-adherent barrier at all. Researchers came to the conclusion that the use of SprayGel significantly reduced surgery time and adherence [34].

Installing Chemical Substances

The only chemical substance that has been authorised by the US Food and Drug Administration for this use so far is icodextrin 4% (Adept) (FDA). After surgery, one litre of the solution is injected into the abdomen and left there, with the goal of separating the injured peritoneal shells from other tissues during the first post-operative phase once adhesions start to form [34].

Barriers

Hyaluronic acid films with a carboxymethylcellulose outline (Seprafilm; Genzyme Company, Cambridge, MA, USA) and oxidised cellulose are the two most often employed powered barriers [6].

Hydroflotation

In order to prevent the formation of adhesions during the first healing period, the primary concept behind hydroflotation is the separation of the peritoneal exteriors. To provide this benefit, crystalloid solutions—such as Ringer's lactate—must be injected into the peritoneal cavity [6].

Treatment

Hospitalization

A duodenal blockage necessitates hospitalisation of the patient. Conduct includes bowel rest with no food or drink (NPO), intravenous (in the vein) fluids, and, occasionally, bowel decompression using a nasogastric tube (a tube that is implanted into the nose and goes straight to the gut) [34].

Anti-Emetics

The use of medications to treat nausea and vomiting while at sea may be required. Surgery can be required if the small intestine is entirely obstructed or garroted. The goal of surgery is to locate and address the causes of intestinal blockage. Sometimes, certain intestine portions may require surgery. It could be necessary to re-section the affected area to remove it [35].

CONCLUSION

Preventive therapy is crucial, especially for high-risk patients, as adhesion-related illness places a considerable financial burden on healthcare facilities. In high-risk bags, precautionary measures and isolated barriers should be taken into account. An increasingly recognised source of difficulties, post-operative adhesions range from pain to intestinal obstruction and frequently necessitate expensive surgical treatments that put the patient's life and health at risk. Usually, adhesions are identified during a "second check" including a laparotomy, which is frequently insufficient and late. Depending on the surgery type and procedure, there are differences in the frequency and severity of post-operative adhesions.

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