Prevalence and Updated Management of Paralytic Ileus: A Simple Review

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Authors’ contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The study aims to summarize the updated evidence regards, epidemiology, causes, clinical manifestations, and management of paralytic ileus. Lower abdominal surgical procedure, particularly big open cuts and increased bowel operations, is linked with an increased hazard of bowel obstruction. Though, numerous risk issues have been revealed to upsurge the probability and resistance of intestinal obstruction, such as prolonged abdominal / pelvic surgery, lower gastrointestinal (GI) surgery, open surgery, retroperitoneal spine surgery, opioid use, cancer peritoneal, intra-abdominal inflammation (sepsis / peritonitis), delayed enteral nutrition or nasogastric (NG) tube placement, and hypokalemia. Signs of intestinal obstruction are tachycardia caused by any interruption of movement, absence of abdominal pain, abdominal distention and tenderness, shortness of breath, and hypovolemia. Bowel sounds disappear and flatulence is not

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discharged, leading to gastric stasis, which can cause hiccups, discomfort, and easy vomiting. Preventive measures include avoiding unnecessary exposure and over-processing of the intestine or traction of the mesentery. Treatment is conservative, as this condition is mostly self-limited. Pharmacologic Therapy have little place, but there are some exceptions of adequate values.

Keywords: Prevalence; updated management; paralytic ileus; lower abdominal surgery.

1. INTRODUCTION

Paralytic intestinal obstruction is a functional motor paralysis of the digestive tract secondary to neuromuscular insufficiency that affects the myenteric nervous plexus (Auerbach) and / or the submucosal nervous plexus (Meissner). The intestine cannot transmit peristaltic waves, which causes dysfunction and allows fluid and gas to accumulate in the intestine [1].

The small intestine is primarily affected, but the stomach and colon can also be affected. The resulting stasis leads to accumulation of fluid and gas in the intestinal cavity, accompanied by vomiting, bloating, reduced bowel sounds, and absolute constipation. Paralytic intestinal obstruction is a neurogenic disease in which there are normal slow electrical waves in smooth muscles, but no action potentials are triggered. This mechanism is thought to be adrenergic stimulation and may involve the release of dopamine, but it has not been proven that blocking adrenergic receptors or inhibiting dopamine has a therapeutic effect [2].

In postoperative POI intestinal obstruction, α2-adrenergic inhibitory reflex and peptide afferent contribute to this process [3]. Movement inhibition is triggered by a variety of stimuli, the most common being tactile stimulation and peritonitis during surgery. Paralytic intestinal obstruction is common in POI and resolves after about 24 to 48 hours or due to hypokalemia caused by diuretic use. The entire intestine may be affected and may become very dilated [4].

The peristalsis of the small intestine recovers within a few hours, and the peristalsis of the stomach and colon recovers within a few days, depending on the degree of trauma. If hypokalemia, hypoproteinemia, or kidney failure occurs, or if the intestines are allowed to become very swollen, it may be prolonged. Uremia can also cause intestinal obstruction, usually accompanied by bloating, vomiting, and hiccups. Peritonitis (infection) can cause intestinal obstruction. Bowel obstruction is also sometimes associated with retroperitoneal trauma and bleeding, spinal or rib fractures, severe trauma outside the abdomen, and casting. This occurs by overstimulation of the reflex sympathetic nerves. Paralytic intestinal obstruction can also be classified based on the location of insufficient exercise [5].

Acute gastric dilation may represent extreme gastric stasis caused by dystonia after any abdominal surgery, with a high risk of aspiration and death [6]. Patients with mental illnesses such as anorexia can occur when taking large doses of psychotropic drugs and diabetic gastric autonomic neuropathy. Although the remedy is performed by inserting a wide nasogastric tube, the electrolyte imbalance caused must be corrected, especially hypokalemia [7]. Acute colonic pseudo-obstruction (Ogilvie syndrome) is caused by hypokinesia of the colon, leading to massive but reversible expansion of the colon. It occurs in critically ill or postoperative patients. If the colonoscopy or surgery fails to recognize or decompress after conservative treatment fails, or if the clinical signs indicate ischemia or perforation without laparotomy, the mortality rate may be as high as 45% [8].

1.1 Objectives

The study aims to summarize the updated evidence regards, epidemiology, causes, clinical manifestations, and management of paralytic ileus.

2. METHODOLOGY

2.1 Study Design

Simple review article.

2.2 Study duration

Data was collected during the period from 1 June – 29 July, 2021.

2.3 Data Collection

Medline, Google scholar, EMBASE and PubMed database searches was performed for articles.
about the most important recent developments regards, epidemiology, causes, clinical manifestations, and management of paralytic ileus, published in English around the world. The keyword search headings included “Prevalence, Updated Management, Paralytic Ileus, Lower abdominal surgery”, and a combination of these was used. References list of each included study will be searched for further supportive data.

3. EPIDEMIOLOGY

Ileus is most commonly seen in patients undergoing surgical treatment.

The incidence of intestinal obstruction varies greatly and usually depends on the type of surgery, the amount of bowel manipulation, and preoperative comorbidities. Lower abdominal surgery, especially large open incisions and increased bowel operations, is associated with an increased risk of bowel obstruction [9]. In contrast, laparoscopic surgery and cholecystectomy have the fewest bowel operations and lower risks. The literature shows that depending on the operation, there is a 10% to 20% chance of intestinal obstruction [10].

The incidence of ileus in patients undergoing laparotomy is approximately 9,000 per 100,000 cases worldwide.

The incidence of ileus in patients undergoing thoracic procedures is approximately 1,400 per 100,000 cases worldwide.

The incidence of ileus in patients undergoing orthopedic procedures is approximately 1,500 per 100,000 cases worldwide [10, 11].

Regarding prevalence of ileus, it is a common complication in the postoperative setting and is often considered a normal sequela of surgery and the majority of the cases are not reported. Postoperative ileus has been present in 15% of patients who had partial bowel resection, based on one study [12].

It is estimated that around 10 percent of the patients (or 10,000 per 100,000 cases) undergoing surgical procedures develop ileus that lasts longer than 3 days.

In the United States, approximately 2.7 million patients developed postoperative ileus lasting more than 1 day [13].

Age, patients of all age groups may develop ileus. Ileus is more commonly seen in elderly patients due to underlying comorbidities.

Race, there is no racial predisposition to ileus.

Gender, ileus affects both men and women equally [13, 14].

4. CAUSES

The cause of ileal obstruction is still unclear [15]. However, there are several risk influences that surge the possibility and persistence of bowel obstruction, such as lengthy abdominal/pelvic operation, lower gastrointestinal (GI) surgery, open surgery, retroperitoneal spine surgery, opioid use, peritoneal carcinomatosis, Intra-abdominal inflammation (sepsis/peritonitis), delayed enteral nutrition or nasogastric (NG) tube placement and hypokalemia [16]. The risk of bowel obstruction is influenced by many factors, each affecting a small part of the complex neuro-immune system. These factors include pharmacological agents such as opioids, antihypertensives, and antiemetics, as well as medical conditions such as pneumonia, stroke, and electrolyte abnormalities [17].

5. CLINICAL MANIFESTATION

The sign of ileal obstruction is the cessation of all motor activity. Usually no abdominal pain, definitely no abdominal pain, but can be a little painful from the tension [4]. There may be tachypnea due to displacement of diaphragms and tachycardia due to hypovolemia. The absence of bowel sounds, indigestion of gas and the resulting stagnation of gastric juices can cause easy hiccups, discomfort and vomiting, unless gastric aspiration has been performed. Distended and edematous abdomen. The abdomen is usually silent when listening to the fetal heart or hearing a silent “rumble” due to bowel distension when moving the abdomen. [1,2]. In pseudo-obstruction, peristalsis usually affects the entire gastrointestinal tract, although distension of the colon is often the most important [5]. Colonic dilation with signs of systemic disturbance (“toxin dilation”) is becoming less common as exacerbations of ulcerative colitis are recognized and appropriately treated. Clinical manifestations may be biased by steroids; The danger if surgery is inappropriately delayed is colonic perforation, which always leads to high mortality. Colitis can also occur in Crohn's disease and rarely in
ischemic or infectious colitis (e.g., Yersinia enterocolitica, Campylobacter sp., and Clostridium difficile pseudomembranous colitis). The x-ray of the paralytic ileus is diagnostic. A simple vertical abdominal x-ray shows dilated bowel loops with multiple levels of fluid, showing distension with fluid and air throughout the small intestine and often in several or all of the large intestine [19]. Abdominal and pelvic computed tomography (CT) is used to confirm the diagnosis of postoperative bowel obstruction in the absence of radiologic diagnosis. CT scan results that diagnose POI include multiple levels of intra-abdominal fluid, an elevated diaphragm, dilation of the large and small intestines, and no signs of mechanical obstruction. Computed tomography with IV contrast media and water-soluble contrast media can also differentiate early postoperative bowel obstruction from mechanical obstruction [19].

6. MANAGEMENT

Precautionary measures include avoiding unnecessary contact and manipulation of the bowel or its traction on the mesentery. Treat with caution, as this condition usually resolves on its own.

Recovery is accelerated by correcting any fluid or electrolyte deficiencies by infusion of fluids and nutrients through the gastrointestinal tract, and by means of "degrading" of the small intestine by how to decompress the stomach. Hypokalemia requires special attention [20].

Avoid fluids and oral foods until the bowel sounds return or the distension subsides. It is necessary to find the cause of the intestinal obstruction and treat it. Conservative treatment is often successful in the ileum after surgery and contractility may return, especially if electrolyte and water balance can be restored. Recently, several studies on endotracheal intubation have called into question its effectiveness in upper digestive surgery [21].

Nasogastric catheterization may delay the return of bowel sounds and increase the incidence of nausea and patient discomfort, but it has no effect on the incidence of postoperative bowel obstruction. Fluid lost during intubation is predominantly alkaline, which leads to acidosis. Therefore, intravenous physiological saline infusion should be supplemented with lactate or carbonate or balanced saline solution (Ringer's or Hartmann's solution) [20, 21]. It is important to remember when calculating daily fluid balance that these patients will need fluids to replace not only ongoing losses (eg, nasogastric aspiration) and basic daily requirements, but also fluid deficiency. long term, or the loss of third place [22]. Patients with chronic dehydration may lack 5 L or more of extracellular fluid, which must be replaced slowly over the first 48 hours to avoid excessive expansion in weekly plasma volume [23].

Pharmacotherapy has little room, but anti-motility drugs such as cisapride have been given parenterally to stimulate peristalsis. In laparotomy, many studies have demonstrated the beneficial effects of alvimopan in restoring bowel function [22]. Gastrografin has been recognized to be useful in reducing intestinal edema and thus shortening ileus time, as it is an oral hyperosmolar contrast agent. Multimodal analgesia regimens when used in combination with early enteral feeding have demonstrated benefit in restoring gastrointestinal motility. Attempts at adrenergic blockade combined with cholinergic stimulation have been less successful [24].

Return of function is informed by a decrease in abdominal aspiration and circumference, and the appearance of flatulence. If the bowel obstruction is related to a mechanical cause such as intra-abdominal sepsis, strangulated obstruction, or peritonitis, it is important to relieve distension by intubation and prompt resuscitation prior to surgery, right away [25]. It is physiologically important that patients do not clear the obstruction for more than 48 hours, as local and systemic complications subsequently worsen the prognosis [26].

7. CONCLUSIONS

Paralytic ileus, also known as paralytic ileus, is a functional motor paralysis of the gastrointestinal tract secondary to neuromuscular insufficiency involving the neuromuscular plexus (Auerbach) and submucosa (Auerbach) and the submucosa (Meissner). The intestines fail to transmit peristaltic waves, resulting in functional obstruction and allowing fluids and gases to build up in the intestine. Ileus is most often seen in patients undergoing surgical treatment.

The incidence of bowel obstruction varies widely, often depending on the type of surgery, the number of bowel manipulations, and preoperative co-morbidities. Lower abdominal
surgery, especially with large open incisions and multiple bowel manipulations, is associated with a higher risk of bowel obstruction. In contrast, laparoscopic surgery with minimal bowel manipulation, such as cholecystectomy, has a lower risk. The literature shows a risk of intestinal obstruction of approximately 1020% depending on the procedure. The cause of ileal obstruction is not yet clear. However, a number of risk factors have been shown to increase the likelihood and persistence of bowel obstruction, such as prolonged abdominal / pelvic surgery, lower gastrointestinal (GI) surgery, surgery and open surgery, retroperitoneal spine surgery, opioid use, peritoneal carcinomatosis, intra-abdominal inflammation (sepsis / peritonitis), delayed enteral nutrition or nasal catheterization - stomach (NG) and hypokalemia. Signs of ileal obstruction are cessation of all motor activity, absence of abdominal pain and abdominal tenderness due to oppression, tachypnea, and tachycardia due to hypovolaemia. Intestine.

Treatment is conservative, as the condition is mostly self-limiting. Pharmacologic Therapy have little place, but there are some exceptions of adequate values.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Schwarz NT, Beer-Stotz D, Bauer AJ. Pathogenesis of paralytic ileus. Ann. Surg. 2002;235(1):31–40. [PMC free article] [PubMed] [Google Scholar]
2. Vather R, O’Grady G, Bissett IP, Dinning PG. Postoperative ileus: mechanisms and future directions for research. Clin. Exp. Pharmacol. Physiol. 2014;41(05):358–70. [PubMed] [Google Scholar]
3. Harnsberger CR, Markel JA, Avavi K. Postoperative ileus. Clin. Colon Rectal Surg. 2019;32(3):166–70. [PMC free article] [PubMed] [Google Scholar]
4. Lubawski J, Saclarides T. Postoperative ileus: strategies for reduction. Ther. Clin. Risk Manag. 2008;4(5):913–7. [PMC free article] [PubMed] [Google Scholar]
5. Vanek VW, Al-Salti M. Acute pseudo-obstruction of the colon (Ogilvie’s syndrome). An analysis of 400 cases. Dis. Colon Rectum. 1986;29(3):203–10. [PubMed] [Google Scholar]
6. Stakenborg N, Gomez-Pinilla J, Boeckstaas GE. Postoperative ileus: Pathophysiology. Current therapeutic approaches. Hands Exp. Pharmacol. 2017;239:39–57. [PubMed] [Google Scholar]
7. Vather R, O’Grady G, Bissett IP, Dinning PG. Postoperative ileus: mechanisms and future directions for research. Clin. Exp. Pharmacol. Physiol. 2014;41(05):358–370. [PubMed] [Google Scholar]
8. Vather R, Bissett IP. Risk factors for the development of prolonged post-operative ileus following elective colorectal surgery. Int J Colorectal Dis. 2013;28(10):1385–1391. [PubMed] [Google Scholar]
9. Moghadamyeghaneh Z, Hwang GS, Hanna MH, Phelan M, Carmichael JC, Mills S, Pigazzi A, Stamos MJ. Risk factors for prolonged ileus following colon surgery. Surg Endosc. 2016 Feb;30(2):603-609. [PubMed]
10. Nazzani S, Bandini M, Preisser F, Mazzone E, Marchioni M, Tian Z, Stubinski R, Clementi MC, Saad F, Shariat SF, Montanari E, Briganti A, Carmignani L, Karakiewicz PI. Postoperative paralytic ileus after major oncological procedures in the enhanced recovery after surgery era: A population-based analysis. Surg Oncol. 2019 Mar;28:201-207. [PubMed]
11. Wolff BG, Viscusi ER, Delaney CP, Du W, Techner L. Patterns of gastrointestinal recovery after bowel resection and total abdominal hysterectomy: pooled results from the placebo arms of alvimopan phase III North American clinical trials. J Am Coll Surg. 2007 Jul;205(1):43-51. [PubMed]
12. Su’a BU, Pollock TT, Lemunu DP, MacCormick AD, Connolly AB, Hill AG. Chewing gum and postoperative ileus in adults: a systematic literature review and meta-analysis. Int J Surg. 2015 Feb;14:49-55. [PubMed]
13. Flores-Funes D, Campillo-Soto Á, Pellicer-Franco E, Aguayo-Albaisini JL. The use of coffee, chewing-gum and gastrografin in the management of postoperative ileus: A
14. Wehner S, Vilz TO, Stoffels B, Kalff JC. Immune mediators of postoperative ileus. Langenbecks Arch Surg. 2012 Apr;397(4):591-601. [PubMed]
15. Huge A, Kreis ME, Jehle EC, Ehrlein HJ, Starlinger M, Becker HD, Zittel TT. A model to investigate postoperative ileus with strain gauge transducers in awake rats. J Surg Res. 1998 Feb 01;74(2):112-8. [PubMed]
16. Condon RE, Cowles V, Ekborn GA, Schulte WJ, Hess G. Effects of halothane, enflurane, and nitrous oxide on colon motility. Surgery. 1987 Jan;101(1):81-5. [PubMed]
17. Hollenbeck BK, Miller DC, Taub D, Dunn RL, Khuri SF, Henderson WG, Montie JE, Underwood W, Wei JT. Identifying risk factors for potentially avoidable complications following radical cystectomy. J Urol. 2005 Oct;174(4 Pt 1):1231-7;discussion 1237. [PubMed]
18. Vather R, Josephson R, Jaung R, Kahokehr A, Sammour T, Bissell I. Gastrografin in prolonged postoperative ileus:a double-blinded randomized controlled trial. Ann. Surg. 2015; 262(01):23–30. [PubMed] [Google Scholar]
19. Frager DH, Baer JW, Rothepearl A, Bossart PA. "Distinction between postoperative ileus and mechanical small-bowel obstruction: value of CT compared with clinical and other radiographic findings". AJR Am. J. Roentgenol. 1995;164(4):891–4. [PubMed] [Google Scholar]
20. Jangjoo A, Mohammadipoor F, Fazel A, Mehrabi Bahar M, Aliakbarian M, Jabbari Nooghabi M. The role of nasogastric intubation on postoperative gastrointestinal function in patients with obstructive jaundice. Indian J. Surg. 2012;74(5):376–80. [PMC free article] [PubMed] [Google Scholar]
21. Koukouras D, Mastronikolis NS, Tzoracoleftherakis E, Angelopoulou E, Kalfarentzos F, Androulakis J. The role of nasogastric tube after elective abdominal surgery. Clin. Ter. 2001;152:241–4. [PubMed] [Google Scholar]
22. Keller D S, Flores-Gonzalez J R, Ibarra S, Mahmoud A, Haas E M. Is there value in alvimopan in minimally invasive colorectal surgery? Am J Surg. 2016;212(05):851–856. [PubMed] [Google Scholar]
23. Wittbrodt E. The impact of postoperative ileus and emerging therapies. Pharm. Treatment 2006;31:39–59. [Google Scholar]
24. Gero D, Gié O, Hübner M, Demartines N, Hahnlser D. Postoperative ileus:in search of an international consensus on definition, diagnosis, and treatment. Langenbecks Arch Surg. 2017;402(1):149-158. [PubMed]
25. Chen J Y, Ko T L, Wen Y R et al.Opioid-sparing effects of ketorolac and its correlation with the recovery of postoperative bowel function in colorectal surgery patients:a prospective randomized double-blinded study. Clin J Pain. 2009;25(06):485–489. [PubMed] [Google Scholar]
26. Traut U, Brügger L, Kunz R, Pauli-Magnus C, Haug K, Bucher HC, Koller MT. Systemic prokinetic pharmacologic treatment for postoperative adynamic ileus following abdominal surgery in adults. Cochrane Database Syst Rev. 2008 Jan 23;(1):CD004930. [PubMed]

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