OCCURRENCE OF OBSTRUCTION AFTER STOMA CREATION

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ABSTRACT

BACKGROUND

Small-bowel obstruction (SBO) is a common surgical emergency that occurs in 9% of patients after abdominal surgery. Up to 73% are caused by peritoneal adhesions.[1] The primary purpose of this study is to evaluate the rate of adhesive SBO in a cohort of patients who underwent a range of ileal and colonic stoma surgery.

MATERIALS AND METHODS

This is a retrospective descriptive study. Data was analysed from a prospectively collected database and cross checked with operating theatre records and hospital patient management systems.

RESULTS

The study period was from August 2017 to November 2018, a 14-month period in the department of general surgery, SMIMER Hospital, Surat. Total 62 (100%) patients had ostomy. 48 (77%) patients had ileostomy, 6 (10%) patients had transverse colostomy and 8 (13%) patients had sigmoidostomy. 5 (10%) patients had developed intestinal obstruction. From them, 2 (4%) patients had developed obstruction immediately after surgery. 3 (6%) patients had developed obstruction after 3 weeks of first surgery. The cause obstruction was adhesion in all cases.

CONCLUSION

Stoma formation is associated with a 2-fold increase in SBO. Adhesional SBO obstruction is a common complication after ileocolonic stoma surgery.

KEY WORDS

Ileal Colonic Stoma Surgery, Intestinal Obstruction, Adhesion, Resurgery.

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BACKGROUND

A bowel obstruction is when the normal movement of food, fluid, gas is prevented from occurring within the bowel (intestines). Obstructions can be either partial, meaning some of the fluid and gas passes through, but usually solids don't or complete, meaning nothing is able to pass through the bowel.[2] Acute small-bowel obstruction (SBO) is one of the most common surgical emergencies. The incidence of SBO after abdominal surgery is estimated at 9%.[3] Peritoneal adhesions are reported to be the cause of 56% to 75% of all SBOs,[1,4] making them the most common cause of SBO. Approximately one-third of people who develop an adhesional obstruction within 1 year of surgery,[5] and 7.7% to 18% of patients with adhesional SBO require reoperation with adhesiolysis for definitive treatment.[6] The incidence of adhesive SBO depends on patient factors as well as the nature of previous surgery.[3] Paediatric patients tend to have the highest incidence of adhesive SBO, which may be explained, at least in part, by a longer postoperative life span than that of the adult population.[7]

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Abdominal adhesions are most commonly caused after abdominal surgery by unavoidable handling of organs. It has been shown that adhesions that form after surgery are a result of the body's normal healing process and that they develop during the first three to five days. Almost everybody who undergoes abdominal surgery develops adhesions, however the risk is greater after lower abdominal and pelvic operations, including bowel and gynaecological surgery. They may become larger and tighter as time passes, causing problems.[8] Small bowel obstruction is a significant consequence of post-surgical adhesions. The adhesions can kink, twist or pull the intestine out of place and prevent the flow of content through the digestive tract.[9] Abdominal adhesions in the ileum or colon may cause blockage as well. Abdominal adhesions are bands of fibrous tissue that form between abdominal tissues and organs, causing them to kink or narrow. [10]Signs and symptoms may include Severe abdominal pain or cramping, Abdominal distention, Vomiting, Abnormal bowel sounds, Inability to pass stool and flatus through stoma.

Aim of The Study

The aim of our study was to evaluate the causes of development of obstruction after stoma surgery.

Study Design

Retrospective descriptive study.

MATERIALS AND METHODS

We studied patients operated from August 2017 to November 2018 for intestinal obstruction after previous stoma surgery

in department of General Surgery, SMIMER Hospital, Surat. It is a retrospective descriptive study. Data were analysed and cross checked with operating theatre records and hospital patient's management systems. Total 62 patients had stoma surgery. 8 patients out of them developed intestinal obstruction. They were operated and found to have adhesions.

The diagnosis of SBO was defined by a combination of different clinical criteria including pain, nausea, vomiting, cessation of passage of stools, abdominal distention and abnormal bowel sound, in addition to imaging confirmation (Dilated small bowel loops and multiple abnormal air fluid levels on x-ray abdominal erect posture) (Figure 1). All patients with suspicious of SBO underwent a computed tomographic (CT Scan) of abdomen to confirm diagnosis. All admissions for SBO were recorded. The data included the interval from the date of surgery to the occurrence of SBO, type of surgery, readmission length, intraoperative findings and management.

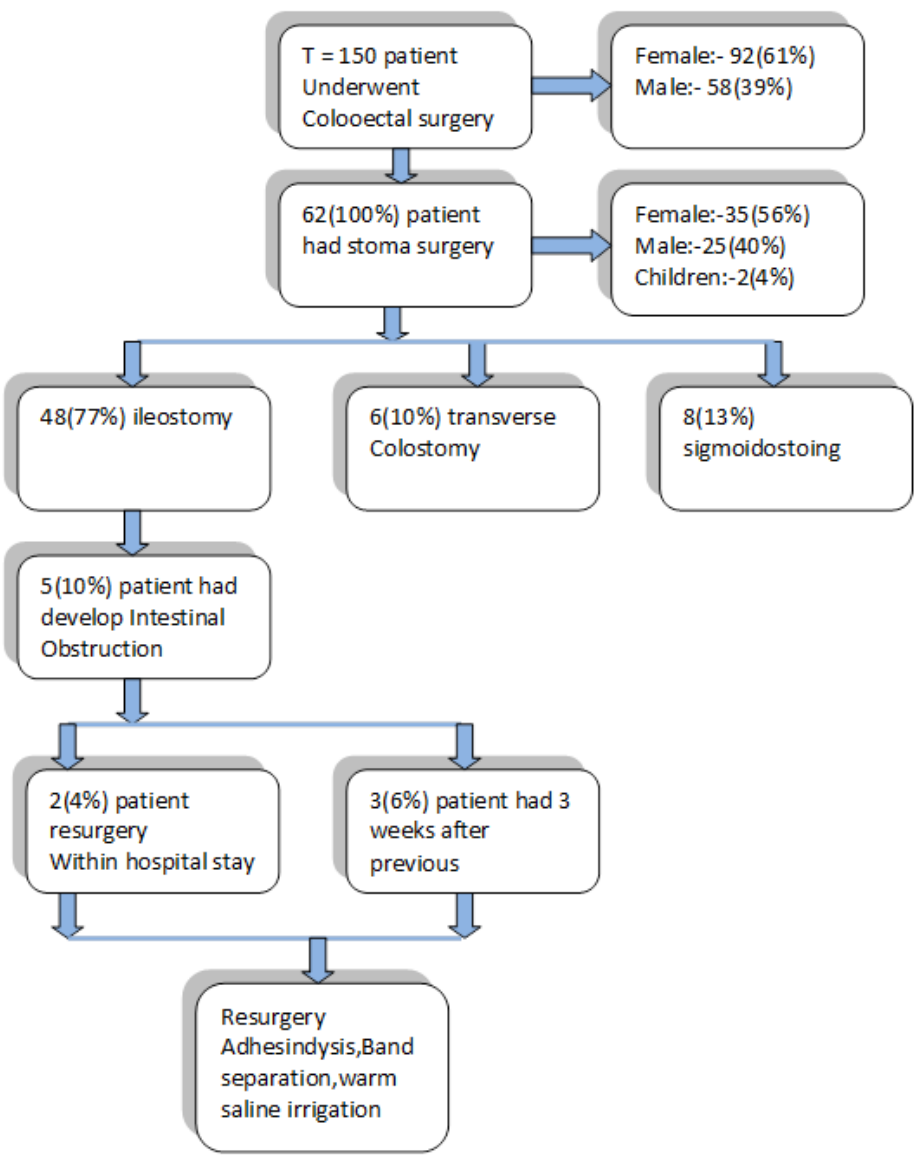
RESULTS

(Flow Chart-1)

A total 62 patients with stoma, 48 (77%) had ileostomy, 6 (10%) with transverse colostomy, 8 (13%) patients with sigmoidostomy. (Flow-Chart 1)

Out of 48 patients of ileostomy, 5 (10%) patients developed intestinal obstruction. Out of them, 2 (4%) patients had developed intestinal obstruction during same hospitalization. They were immediately diagnosed and reoperated. 3 (6%) patients had developed after 3 weeks of first surgery with complaint of vomiting, abdominal distention and stool not coming out from stoma. These 3 patients were re-operated. All patients had bowel adhesions, band formation and impacted hard stool in bowel (Figure 2). All bowels were inflamed and had thickened wall. An obese female patient had retracted stoma with stenosis and bowel adhesions.

Adhesiolysis, division of band, milking of bowel content up to stoma, warm normal saline wash were done. Refreshing stoma margin was done in obese female who had stoma stenosis.



Flow Chart 1. Analysis of Study

Figure 1. X-Ray Abdomen- Standing

Figure 2. Intraoperative Findings Adhesions

DISCUSSION

Bowel obstruction has been documented throughout history with cases detailed in the Praxagorus in 350 BC and by Hippocrates.[9] It constitutes a major cause of morbidity and financial expenditure in hospitals around the world and is significant cause of admissions to emergency surgical departments.[10,11]

About 20% of people admitted to hospital with an acute abdomen, have an obstruction of their bowel. Of these 20%, the majority (80%) will have a small bowel obstruction after ileal colonic surgery.[12] There are several reasons why bowel obstructions occur, however, most common is adhesions (Scar tissue).

Adhesions are bands of tissue, like scar tissue, that can abnormally connect or bind adjacent sections of the bowel together or bind the bowel to other organs within the abdomen or tack the bowel to the inside of the abdominal wall. This scar tissue can prevent the normal movement of food, fluids, and gas through the intestine. Most scar tissue results from some sort of event that disrupts normal tissues. As the body repairs the disruption, it creates scar tissue. Events that can initiate this process include surgery, an infection within the abdomen, trauma, or radiation therapy. Adhesions is the most common complication of surgery, occurring in more than 90% of people who undergo a surgical procedure.[13,14] The adhesions begin to form within days after surgery. In most instances, adhesions do not cause any pain or complications and people are not aware of its presence. The use of magnification, proper handling of tissues, constant irrigation, meticulous hemostasis and the use of microsurgical instruments and fine nonreactive sutures are of most importance. Peritoneal reapproximation, which was previously advocated is now no longer recommended.[15] After peritoneal tissue is resected, natural healing is associated with less adhesion formation than occurs after reapproximation with staples or sutures as demonstrated by McDonald in a rabbit model.[16] The type of injury to the peritoneum can control the formation of intra-abdominal adhesions. The potential to form adhesions is significantly higher in visceral than in parietal peritoneal lesions.

The present study clearly confirms that operated adhesive postoperative SBO may be classified as a high-risk factor for intestinal obstruction. Thus, our overall and surgical recurrence rates (15.9% and 5.8%) may also compare with those reported in high risk surgical procedures of adhesive postoperative SBO, like colorectal surgery in Maclean et al study. [16]

In our study 10% had developed intestinal obstruction after first stoma surgery. All patients had ileostomy in previous surgery. According to Beck DE, Opelka FG, Bailey HR, et al. study Incidence of small-bowel obstruction and adhesiolysis after open colorectal stoma surgery is 35% and 78% had ileostomy in previous surgery.[17,18] Beck and colleagues estimated that 1 in 6 colorectal surgery patients are readmitted for adhesive SBO with in 2 years of their previous stoma surgery. According to Marcello, Roberts et al study, diverting loop ileostomy is associated with a increased risk of a SBO. Which is correlated with our study.

When early obstructions, which are probably most often due to the ileostomy or postoperative oedema, were excluded, the rate of postoperative obstruction (Late SBO) was only 16.8%. Of those patients who developed one late SBO, the risk of having a second obstruction was 23.5%. The latter is on the lower end of the spectrum of previous reports. For instance, Barkan et al reported recurrence rate of 53% after an initial episode of SBO and 85% or more after a second, third, or later episode.[19]

The use of a diverting ileostomy was associated with an increased risk of SBO. This was true for both early and late obstructions. Possible reasons for this are that the small bowel might rotate around the ileostomy, and after closure adhesions may occur at this site, possibly as a result of difficulties in fully mobilizing the ileostomy. Several other studies have also shown ileostomy to be a risk factor for the

development of SBO. Although construction of an ileostomy is associated with an increased risk of SBO, a leak from the ileoanal anastomosis can cause significant complications and is still the most significant complication leading to pouch failure. In some situations, it may be safe to omit the ileostomy. However, if the risk of an ileoanal anastomosis leak is significant, the ileostomy should not be omitted. Instead, in these situations, strategies aimed at reducing adhesions should be adopted. The second risk factor associated with development of late SBO was pouch reconstruction. This was likely due to the multiple operations that these patients undergo.

The development of SBO is associated with significant patient complications and some deaths and is a burden on our healthcare system. For patients who required surgical intervention for SBO, the obstruction was most commonly due to pelvic adhesions, followed by adhesions at the ileostomy closure site. This has implications with regard to adhesion prevention strategies. In this group of patients, these two sites represented more than half of the obstructions requiring surgery. Strategies that reduce the risk of adhesions, particularly in these two sites, are warranted to improve patient outcome and decrease healthcare costs. Trials studying hyaluronic acid-based bioresorbable membranes are in progress, but it remains to be seen whether these will decrease the incidence of postoperative SBO in a cost-effective manner.

As per the review of literature, a complication rate of 41% associated with loop ileostomy construction, with 6% of all patients requiring surgical intervention has been reported.[7] Others had a complication rate of 25% related to loop ileostomy construction and all required surgical intervention.[8] Complication rate of 5.7-10.8% have also been reported.[9] There are many factors suggestive to predispose to stoma complications like high body mass index, inflammatory bowel disease, use of steroids, and immunosuppressant drugs, diabetes mellitus, old age, emergency surgery, surgical technique, and surgeon experience.[20]

A loop ileostomy has an adverse effect on quality of life, which is further enhanced if stoma related complications occur. Complication rates of temporary loop ileostomy range between 5-100%. These rates vary due to varying length of follow-up. Age of patient, urgency of surgery, diagnosis at the time of presentation are the factors associated with high level of morbidity and mortality. Complication rates between 20 and 60 percent were also reported, and this wide difference may be related with different time points.[1] Furthermore, stoma related complications improve with time.[21]

Prevention of Adhesion Formation[22,23,24]

Mechanical Barriers/Intraperitoneal Solutions

Mechanical barriers are available in two forms: free-floating abdominal instillates or membrane barriers; both prevent adhesion formation by preventing tissue apposition during the time period of peritoneal repair and adhesion development.

Anti-Adhesion Adjuvants

The pathogenesis of adhesion formation that has been discussed should direct surgeons toward the best adhesion-preventing techniques. While meticulous microsurgical technique should always be maintained, there are new modalities that can aid in adhesion prevention. Multiple agents have been developed to decrease the formation of adhesions with varying degrees of success.

Intercede combines hyaluronic acid with ferric ion, increasing its viscosity and time spent in the peritoneal cavity. In a multicenter American and European prospective randomized trial by Johns et al., Interceed was found to decrease the number, severity and extent of postoperative adhesions after laparotomy. Adhesion prevention occurred not only at the sites of application but throughout the peritoneal cavity. However, what is called "possible Interceed Reaction Syndrome" (pIRS) including prolonged ileus, peritonitis, and anastomotic dehiscence was described after using Interceed.

ACP gel (Baxter, Italy) is a new cross-linked derivative of hyaluronic acid. A relatively new agent, Adept (Baxter, Deerfield, IL), has been approved by the FDA to be used in laparoscopy and holds promising results as an adhesion preventing agent. It is a 4% Icodextrin solution that in the recent ARIEL (Adept Registry for Clinical Evaluation)

Fibrin glue has also been found to decrease adhesion formation in multiple animal models. It is composed of human fibrinogen obtained either from cryoprecipitate or fresh frozen plasma, thrombin, calcium chloride, factor XIII, and aprotinin solution. Nonsteroidal anti-inflammatory drugs (NSAIDs) and steroids have been extensively studied for their possible anti-adhesion benefits.

CONCLUSION

Adhesional SBO obstruction is a common complication. Development of early SBO is highly associated with a need for further surgical intervention. However, surgeons should keep in mind this future complication when treating a patient by improving surgical techniques, less handling of bowel, proper bowel wash by using newer modality agents.

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