

Investigation of Mortality and Morbidity In Patients Associated With Low Anterior Resection and Ghost Ileostomy

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Abstract

Background: Ghost ileostomy is a newly invented method that is used in patients with low anterior resection and colorectal anastomosis. Ghost ileostomy can be used instead of a converting stoma. A converting stoma (CS) is critical after low rectal resection procedures due to its role in preventing anastomosis leakage, especially in patients who are at higher risk, but its complications are non-negligible. The authors approached a study of Ghost ileostomy to identify its probable post-operation morbidity and mortality. The purpose of this study was to assess the prevalence of some post-operation morbidity such as anastomosis bleeding or hematoma, prolonged ileus, pulmonary embolism, intra-abdominal abscess, wound site infection, and other complications.

Methods: 26 patients with low anterior resection and colorectal anastomosis due to colon cancer without any risk factor between 2013 and 2014 were selected. Checking of anastomosis leakage after 10-14 days post-operation was analyzed to assess the prevalence of anastomosis leakage and compare post-operation morbidity and mortality.

Results: The mean age of cases was 55 years (40 to 65). 16 (61.5%) were male and 10 (38.5%) females. The average BMI is 23.7 and all of the patients are in the normal range. The authors' mortality rate was negative. 2 patients (0.076%) suffered from prolonged ileus and one patient (0.038%) had a wound site infection. Other post-operation morbidities such as anastomosis bleeding or hematoma, pulmonary embolism, intra-abdominal abscess were negative. The authors had no stoma-related morbidity and also no anastomosis morbidity.

Conclusions: Anastomosis leakage is the most common complication in colorectal surgeries. Diverting stoma can decrease complications of anastomosis leakage but there is no evidence of its preventing role. By using ghost ileostomy, the authors can manage selective loop ileostomy and the complications will be reduced. The most reliable way for anastomosis leakage diagnosis is the surgeon's suspicion. Converting stoma that is used for preventing anastomosis leakage, has significant complications of its own. As the anastomosis leakage does not have a high prevalence, the authors can use ghost ileostomy to reduce the complications and improve the quality of life.

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Introduction

Ghost Ileostomy (GI) or Pre-stage ileostomy is a newly invented method that can replace the traditional Converting Stoma (CS). Multiple complications such as low quality of life in patients with stoma, the need for an extra operation to close the stoma, herniation, stoma site infection, increased hospitalization period, increased recovery time, and finally increased cost for the healthcare system.

GI is a vascular intestinal loop from the terminal ileum that comes out from the mesenteric wall of the intestine without any pressure on it. When there is some evidence of anastomotic leakage, GI can simply turn to GS. Otherwise, after 2 weeks, the vascular loop will be cut. Patient selection is an important issue in GI. Patients with no other risk factors and also low-level anastomoses are good candidates for GI [1]. These risk factors include: 1. Complications (malnutrition-malabsorption -heart disease-steroids) 2. Obesity (BMI>30) 3. More than 1 liter bleeding during operation 4. Bowel obstruction 5. Difficult pelvic dissection 6. Incomplete intestinal loop 7. Evidence of anastomotic leakage like high tension at the anastomose site, bleeding or hematoma [2].

A contrast enema will be done after 2 weeks and if there is no evidence of anastomotic leakage, the GI loop will be cut.

CS is critical after low rectal resection procedures due to its role in preventing anastomosis leakage, especially in patients who are at higher risk. Patients with lower anastomose and with a history of chemoradiotherapy are potentially at risk.

The importance of CS has decreased due to stoma-related complications, the need for reoperation to close the stoma, and high costs of hospital care.

Material and Methods

This is a prospective and cross-sectional study conducted from 21 March 2013 to 22 May 2014 in patients who underwent low anterior resection with Ghost Ileostomy (GI) surgery due to colon cancer. Patients with the following conditions usually require a Converting Stoma (CS) procedure:

1. Some medical conditions: (malnutrition, malabsorption, severe heart disease, steroids)
2. BMI>30
3. > 1 liter bleeding during surgery
4. Difficult pelvic dissection
5. Poor blood supply due to vascular disease
6. Incomplete intestinal loop or other anatomical abnormalities
7. Bowel obstruction
8. Evidence of anastomosis defects like bleeding, traction, hematoma, pelvic abscess

Patients without any risk factors are good candidates for GI. Post-operation morbidity and mortality within the first 30 days after surgery include:

1. Respiratory infections
2. Urinary retention
3. Anastomosis bleeding or hematoma
4. Prolonged ileus
5. Pulmonary embolism
6. Myocardial infarction
7. Intra-abdominal abscess
8. Wound site infection

Anastomosis-related morbidities consist of anastomosis complications after primary surgery (low anterior resection due to colon cancer or IBD) or any other defects that disrupt the integrity of the intestinal wall and will cause the connection of internal and external intestinal space like pelvic abscess and bleeding or hematoma at the anastomosis site.

Stoma-related morbidities consist of complications directly caused by the stoma after placement or closure. All of these morbidities will be assessed after 30 days post-operatively. A contrast enema can show any complications about the anastomosis site.

Patients with low anterior resection whose anastomosis site is more than 8cm from the anal verge have been added to the study.

Stoma-related complications are: 1. Bleeding 2. Abscesses 3. Fistula 4. Prestomal dermatitis 5. Herniation 6. Prolapse 7. Stenosis 8. Retraction

Results

Among 26 patients, there were 16 males and 10 females, with an average age of 55 years old and an average BMI of 23.7, all of whom are in the normal range. All anastomoses were performed 8cm from the anal verge with an end-to-end type. Patients with an anastomose distance from the anal verge of less than 8cm were disqualified for our study. All patients had a course of neo-adjuvant chemoradiotherapy.

The authors represented a definition as a protocol for converting CS to GI. This protocol is as follows:

- Checking CRP on the 5th day post-operation, if CRP > 100, the next step is an abdominopelvic CT scan for evaluating anastomosis leakage. If anastomosis leakage is proven, then the patient is a candidate for converting CS to GI.

The authors' mortality rate was negative. Two patients suffered from prolonged ileus and one patient had a wound site infection. The authors had no stoma-related morbidity and also no anastomosis morbidity. The recovery time in GI patients was 5 days after the initial operation and 1 day after cutting the ileostomy.

GIs were generally cut after 10 days in patients with no complications. In complicated cases with

anastomosis leakage, patients must schedule for laparotomy again and after washing the abdomen, GI will turn to CS.

In all 26 patients, GI was cut after 10 days. All patients were under supervision for 30 days and they were visited twice a month. Seven days after GI surgery, patients were checked with a contrast enema to rule out any anastomosis leakage. All of the anastomoses were performed by a double stapler. In order to perform a ghost ileostomy, an intestinal loop is inserted at a distance of 30-40 cm from the ileocecal. This is a vascular loop that attaches to the target place. The proximal loop is placed at the cephalic side and the distal loop is placed at the caudal side. The intestinal loop is taken out without any pressure and is fixed to the cutaneous with a non-absorbable stitch.

Discussion

Total mesorectal anterior resection with excision (TME) is the gold standard treatment for colon cancer. TME frequently causes anastomosis leakage [3]. Anastomosis leakage is the most common complication in colorectal surgeries. The risk of anastomosis in different studies is between 2.6-26% [4-8]. In international studies, anastomosis leakage is defined as any defect or disruption in the integrity of the intestinal wall that causes a connection between the inside and outside of the intestinal lumen. Pelvic abscesses may occur due to anastomosis leakage [9]. Several factors are related to anastomosis leakage: anastomosis length, surgeon's expertise, vascular diseases, diabetes, corticosteroids, BMI>30, smokers, females, malnutrition, splenic flexure mobility. These factors can increase the risk of anastomosis leakage [10]. The mortality rate due to anastomosis leakage has been estimated between 25-37%. The cause of death in most cases was peritonitis and sepsis [11-13]. Although a diverting stoma can decrease complications of anastomosis leakage, there is no evidence of its preventative role [14-21]. In a meta-analysis by Mentori and his colleagues, only 19.6% of patients who did not have diverting stoma leakage symptoms appeared. Although the traditional diverting stoma decreased the mortality of anastomosis leakage, complications and re-operation for closing the stoma had been imposed on the patients, therefore, ghost ileostomy has been created for these reasons. In a study by Ding, it was proven that anastomosis complications are the same in both groups but there were fewer stoma complications in patients who had GI [2].

By using ghost ileostomy, the authors can manage selective loop ileostomy and the complications will be reduced. A contrast enema or angiographic study

in some cases at the end of surgery can reveal any sign of anastomosis leakage, if no leakage exists, GI will be cut. If leakage is limited to a presacral abscess without any sign of peritonitis, conservative management with antibiotics and CT-guided drainage is enough [22, 23].

Anastomosis leakage generally is the most common and the most lethal complication after these surgeries. Usually, clinical signs and symptoms of anastomosis leakage are not expected before the 5th post-op day and surgeons believe this complication happens during the 7-8th post-op day. The most reliable way to diagnose is the surgeon's suspicion and the most reason for delayed and false-negative diagnosis is radiologic procedures [16-18, 24, 25].

There are several ways for diagnosing anastomosis leakage including the surgeon's suspicion, rectal exam, radiology, laboratory tests like inflammatory markers and cytokines, especially drain's fluid microscopic and macroscopic check and evaluating inflammatory markers like Interleukin and Lipopolysaccharide [19-21, 26].

There are other intraoperative ways that can predict the risk of leakage, such as colonoscopy, leak test, and diverting stoma after a methylene blue enema. However, these methods are not so reliable because leakage is a complication that typically occurs after the 5th day, as previously mentioned [26-32].

The most practical and available method is radiologic methods like a CT scan. Although its specificity and sensitivity are 100%, its ability to diagnose intraluminal anastomosis leakage is 10% [29]. Another method used in our center is a water-soluble contrast enema. This modality can be used after surgery and also after closing the stoma. A contrast enema should not be performed before the 5th postoperative day due to increasing complications. The best time for evaluating anastomosis with an enema is the 7-8th postoperative day, at the peak of risk. Some studies have reported evidence of leakage in radiology (without any clinical symptoms) that never leads to any clinical problems. The majority of surgeons believe that when there is some evidence of anastomosis leakage in radiologic modalities but there are no signs of clinical symptoms, the best treatment is to wait and watch with conservative treatment. The accuracy of a contrast enema is 93% (sensitivity=91% and specificity=94%) [32-36].

None of the modalities are known as a gold standard overall, and no one can announce a day as a definite leakage day. Some researchers admit that even laparotomy and seeing fecal matter at the sutures line cannot 100% prove leakage. The best way to diagnose is the surgeon's suspicion, with a wait and watch and protect mechanism [16].

Conclusion

In patients who have undergone LAR surgery, improvising CS has no clear benefit. The creation of this type of stoma is associated with significant problems such as prolonged recovery, the need for additional anesthesia and surgery for closing the stoma, decreased quality of life, and prolonged hospitalization. Despite the lethal risks of anastomosis leakage, this complication is not common in patients without any risk factors.

Ghost ileostomy can help patients avoid stoma-related complications, and if there is any sign of anastomosis leakage, it can be converted to CS. If there is no evidence of leakage, GI can be routinely cut after 10-14 days.

GI has lower costs, shorter hospitalization, improved quality of life, and no complications related to the stoma. Patients selected for GI are highly exclusive and must pass serious steps to be chosen for this procedure. Ghost ileostomy can be recommended as a cost-effective method with fewer complications and greater patient satisfaction.

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