

A Prospective Study of Hidden Ileostomy in Laparotomy To Prevent Anastomotic or Perforation Leak

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Abstract

Background: Whenever there is very less possibility of anastomotic leak after intestinal resections and anastomosis or after perforation repair and the surgeon on the table doesn't feel the absolute need of a conventional ileostomy, the hidden ileostomy is a good alternative option.

Patients and methods: 30 patients presented to our department of General surgery, underwent this technique "Hidden Ileostomy" for different reasons. The clinical case scenarios, lab findings, risk factors with outcome and the follow-up data, are studied and presented

Results: The mean \pm SD operative time is 136.6 ± 14.7 minutes. The HI was removed after an average of 14th POD. Only 2 out of 30 cases needed to exteriorization of HI in view of anastomotic leak. Thus, 93.3% of the patients were saved from formal ileostomy

Conclusion: Present study suggests that HI can be used alternatively to conventional ileostomy whenever there is a minimal risk of AL and in absence of post-operative AL, patients can be saved from conventional ileostomy.

Keywords: Hidden ileostomy, Anastomotic leak, Post Operative day, Standard deviation.

Introduction

Anastomotic leakage is the most significant complication after gastrointestinal surgeries where anastomosis has been done. The consequences of AL are generalized peritonitis, localized abscess formation, and formation of an enterocutaneous fistula. Most minor leaks are managed conservatively. However, if re-exploration becomes necessary, the mortality rate of this complication is very high. In fact, the mortality rate associated with symptomatic anastomotic leaks varies between 6 and 22%

The role of a protective diverting stoma in avoiding this serious complication has repeatedly been discussed. But there are some arguments that the stoma only decreases the severity of the consequences of leakage but does not lower the leakage rate itself. In addition, ostomy construction and closure are associated with considerable morbidity and there is increased cost of treatment. Also, there is a considerable risk of AL at the time of stoma reversal.

Moreover, the creation of a stoma is hardly acceptable to the patients and represents an added psychological trauma to the patients and caregivers. The quality of life in a patient with a stoma is affected by physical and psychological factors. Therefore, the benefits of a protective stoma in decreasing the rate of AL must be balanced against the morbidity associated with its construction and closure.

Developing another technique to minimize those drawbacks with at least the same clinical success can help patients with anastomotic leak. There a novel technique "Hidden Ileostomy" as an alternative to protective ileostomy that can achieve that balance.

The purpose of this study is to find out benefits of the hidden ileostomy in post-operative anastomotic leak in creating the ileostomy and also if anastomotic leak do not occur the ileostomy followed by stoma closure and associated complications can be avoided.

Patients and Methods

The present study is a prospective single group study. It was conducted on patients who needed emergency or elective laparotomy surgery.

Written informed consent to participate in the study, the purpose of the study and the methods of the treatment were carefully explained to the patients in their own languages.

Type of Study: Prospective study

Sample Size: A total of 30 patients were enrolled in this study.

Inclusion Criteria

All the cases of small intestinal pathology requiring resection and anastomosis or perforation closure where protective ileostomy is beneficial

Exclusion Criteria

1. Where most of the part of ileum is resected
2. Where colostomy is more beneficial

3. Resection and anastomosis, perforation closure done in proximal ileum

Hidden Ileostomy

Operative procedure

After the completion of the anastomosis, a hidden ileostomy can be fashioned. The patient is kept in the supine position and maintained under anaesthesia whether general anaesthesia or combined spinal-epidural anaesthesia

Then, an ileal loop approximately 10 cm from the resection and anastomosis or perforation closure is identified, without any tension or twist at the mesentery. The proximal end of the hidden ileostomy loop is marked by a single seromuscular suture with non absorbable Silk suture. Such marking helps us in identifying the proper orientation of the loop in case the hidden ileostomy needs maturation.

Subsequently, a small (3-4 mm) hole or a window is created in the mesentery of this identified ileal loop with the help of electrocautery and a hemostatic artery forceps, taking care not to injure the vascular arcade. Also, this hole in the mesentery should be away from adjacent vessels and about 2-3 cm from the mesenteric border of the ileum. This is to avoid the possible erosion due to the hanging tube into the adjacent vessels and the gut wall.



Figure 1: Identifying and marking the proximal ileal loop and making a hole in the mesentery of the identified loop.

Next, a small (5-6 Fr) soft infant feeding tube is passed through this small opening in the mesentery of the identified ileal loop (Figure 2).



Figure 2: Passing a small infant feeding tube through the hole in the mesentery

Again, a small 5 mm incision is made at the pre-operatively marked proposed ileostomy site on the parietal wall in the right iliac fossa region. A Kelly hemostatic forceps is then introduced

through this small incision to get out the two limbs of infant feeding tube, which has already been looped around the identified ileal loop

These two limbs of the feeding tube are subsequently cut short and fixed to each other and to the surrounding skin with 2-0 silk sutures

Take care to keep the tubing loop loose enough to avoid any tension to the vascular supply and without causing any luminal compression of the ileal loop.

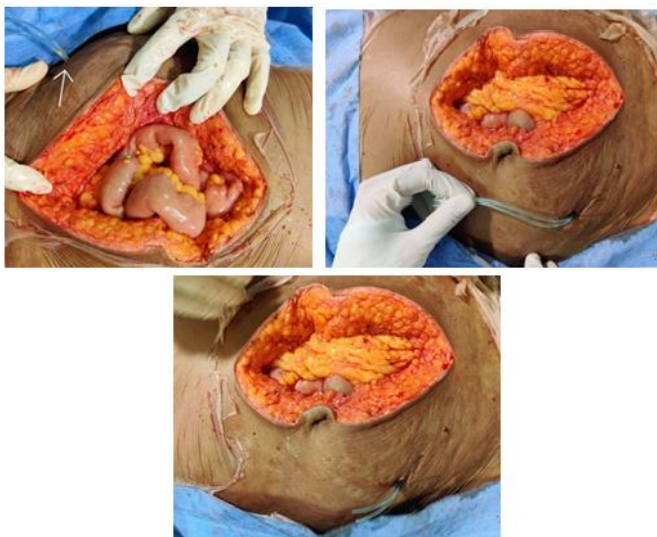


Figure 3-5: Final external appearance

After fixation of the infant feeding tube, the main laparotomy incision is closed, taking care to keep away the hidden ileostomy loop from the main wound and also to cover the laparotomy incision area from inside with omentum, preventing the adherence of the HI loop to the main laparotomy wound.

In this way, in the case that the HI needs maturation, this ileal loop is free of adhesions with the parietal wall and main incision site and can be easily mobilized and exteriorized

Removal of infant feeding tube and release down of hidden ileostomy:

After the confirmation that there is no anastomotic leak, the removal of the hanging IFT loop from the abdominal cavity in order to release the tucked ileal loop is referred to as the 'release down' of HI. It can be done after the seventh POD but should be preferably done after the tenth POD. In the case of an uncomplicated postoperative course, this fixing tube of the hidden ileostomy is removed in the ward without the need for any anesthesia as described in the following steps:

1. Keep the patient in the supine position on his/her bed and uncover the area of the HI
2. Apply betadine paint on the HI tubing and the skin around it.
3. Cut the fixing suture of the HI tube to free the tubing from the surrounding skin.
4. Slightly pull both limbs of the tubing and cut one limb with the help of scissors.
5. Gently pull one end of the tubing from the abdominal cavity to release down the already tucked ileal loop.
6. Clean the wound area and apply a small antiseptic dressing.

Maturation of Hidden ileostomy

To mitigate the consequences of AL after bowel anastomosis, the pre-stage HI is converted into a full-

fledged formal diversion loop ileostomy. This conversion into a formal diversion loop ileostomy is referred to as maturation or exteriorization of the HI.

In case of AL suspected on clinical plus radiological grounds, the pre-stage HI is easily transformed into a formal diversion ileostomy as described in the following steps:

The exteriorization of the HI is usually done under local anaesthesia by infiltrating about 15 ml of diluted lignocaine-adrenaline solution around the HI site into the subcutaneous plane and in-between the parietal wall muscles (transverse abdominis plane block). Alternately, if the patient is anxious and uncooperative, spinal anaesthesia can be used

- The patient is kept in the supine position on the operating table. After painting and draping the patient, hold the two limbs of the looped infant feeding tube with the help of an artery forceps
- A circular incision about 2-2.5 cm diameter is made around the HI tubing with the help of monopolar cautery.
- This circular incision is deepened up to the parietal wall sheath and the disc-shaped skin patch is excised along with the fat in order to enter the peritoneal cavity.
- A cruciate incision is given on the sheath around the tubing of the HI taking care not to injure the underlying ileal loop. This cruciate incision should be large enough to admit 2-3 fingers so that the ileal

loop can be easily pulled up and accommodated as loop ileostomy.

- To get the desired ileal loop out of the peritoneal cavity through this incision, gently pull the tubing up along with the tucked ileal loop. If the ileal loop does not come out easily, gently sweep your finger around the ileal loop to break the adhesions and make this loop mobile before pulling up any further
- Bring out the adequate length of the ileal loop sufficient to construct the formal loop ileostomy. Cut the tubing around the ileal loop and proper orientation to the ileostomy is achieved.
- Identify the proximal and distal ends of the loop by identifying the already placed suture marks (described in the above section)

Now, make a transverse incision on the antimesenteric border of this ileal loop and complete the ileostomy in the standard fashion by taking simple sutures between full thickness bowel wall, followed by a seromuscular bite just proximal to skin and finally a bite of the dermal layer.

The stoma should protrude adequately, with its functional end occupying approximately 80% of the trephine circumference

Observation

Sr.no.		Ezzy et al.(2021)	
1	No.of cases	8	30
2	Male to female ratio	1:1	7:3
3	Mean SD age	69.5±13.8 years	40.1±5.9 years
4	Mean SD operative time	40.1±5.9 min	136.6±14.7 min

5	HI removed on	POD 8	POD14
6	No. Of pt with anastomotic leak	1	3
7	No. Of pt with exteriorization of HI	1	2
8	Post-operative stay	Average 10days and 28days in pt with AL	Average 10 days and 21 days in pt with AL

The present study was compared with study Ezzy et al. Which was published in year 2021 and included eight cases where 4 were males and 4 were females. The mean \pm SD age of included patients was 69.5 ± 13.8 years. BMI was 24.65 ± 4.2 kg/m². The mean \pm SD operative time was 196.3 ± 16.4 min and The hidden ileostomy was removed after an average of 8 days

The present study includes total 30 cases and the male to female ratio is 7:3 while mean \pm SD age is 40.13 ± 5.9 years. The mean \pm SD BMI is 23.5 ± 0.8 Kg/m² The mean \pm SD operative time is 136.6 ± 14.7 minutes. The hidden ileostomy was removed after an average of 14th post-operative day. Only 2 out of 30 cases needed to exteriorization of HI in view of anastomotic leak. Average post-operative hospital stay was 21days in patient with exteriorization and 10days in all other cases. Total 15 patients were ASA grade 1, 3 patients were ASA grade II, 9 with ASA grade III and 3 with ASA grade IV

3 Cases out of 30 had reported anastomotic leak on post-operative day 7,9 and 2. Amongst them 2 cases undergone exteriorization of previously fashioned HI. Thus, 93.3% of the patients were saved from formal ileostomy and hence shorter overall hospital stay, lesser degree of total morbidity, lesser overall cost of treatment, and higher rates of stoma-free life. These 93.3% patients are also saved from the another operative procedure after 3 to 6 months for stoma closure and cost, comorbidities related to it.

Discussion

Whenever there is any possibility of anastomotic leak after intestinal resections and anastomosis and the surgeon on the table doesn't feel the absolute need of a conventional ileostomy, the hidden ileostomy is a good alternative option and can be constructed in the situations like single or multiple distal ileal perforations, perforated appendix with inflamed caecum with risk of future caecal perforation, Tumor masses involving terminal ileum or ascending or transverse colon, etc.

Though there is no absolute contraindication for HI done in elective settings, patients with multiple risk factors for AL should be covered with a conventional ileostomy. The HI should be avoided in the following groups: patients with significant risk factors for AL, immunosuppressed patients due to infectious diseases like pulmonary or abdominal Koch, uncontrolled systemic diseases, patients massive blood loss due to trauma, 2 to 3 days old intestinal perforations with fecal peritonitis, septicaemia, and importantly, malnourished patients with severe pre-operative Hypoalbuminemia

In the present study, I did not come across any significant complications apart from the conversion to formal loop ileostomy in two patients, there are possible complications related to hidden loop and one must be vigilant t prevent, identify and treat those complications if they occur, eg. bow obstruction due to kink or luminal compression of the ileal loop by the tight fixed IFT tubing, bleeding in the mesentary, compression of the ileal vasculaturu resulting in chronic ischemia of the ileal loop with the possibility of subsequent stricture

formation and difficulty of removing the tubing at the time of release down.

Conclusion

In the present study following conclusions are derived Overall operative time is less as it takes hardly 10minutes to create hidden loop ileostomy than conventional ileostomies.

Present study suggests that HI can be used alternatively to conventional ileostomy whenever there is a minimal risk of AL and the surgeon on the table doesn't feel the absolute need of a conventional ileostomy

In absence of post-operative AL, patients can be saved from conventional ileostomy, treatment cost, re-operation for stoma closure, complications and morbidity associated with it.

However, when we have to construct formal ileostomy from hidden ileostomy we cannot guarantee complete drainage of peritonitis which may remain inside peritoneal cavity and further complicate to form abscess or fistula

If there is anastomotic site or perforation repair site leakage, formal ileostomy from HI should be constructed at the earliest to get the benefit.

In our study only two patients were required construction of formal ileostomy from HI out of which one patient had fistula formation.

We had inadequate data to study patients' post-operative course and complications of formal ileostomy from HI

In our study we could not find much benefit of hidden ileostomy.

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