

Original research article

A Comparative Study between Early and Delayed Ileostomy Closure

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Abstract

Background: An ileostomy is an external opening constructed between the small intestine and the abdominal wall, usually by using distal ileum, Ileostomies can be of various types. The most common has been the end ileostomy, using a technique popularised by Brooke and Turnbull. Aim And Objective; To compare the morbidity & mortality incidence of early & delayed ileostomy closure.

Conclusion: In conclusion, from reports of our limited experience with both methods early closure of temporary loop ileostomy within 4 weeks shows no significantly increased morbidity except increased wound infection. Routine allocation of patients with temporary loop stomas to early closure could improve patient well being.

Keywords: Ileostomy, Small bowel resection, Early relaprotomy.

Introduction

An ileostomy is an external opening constructed between the small intestine and the abdominal wall, usually by using distal ileum, but sometimes more proximal small intestine(1). Digestive waste then exits the body through an artificial opening called a stoma (from the Greek word for "mouth"). It is a surgical procedure which is frequently used now a days in various surgical conditions e.g. to protect a rectal anastomosis, to avoid spreading fecal peritonitis if anastomosis is leaking, for fecal diversion in emergency surgery with peritoneal contamination and many more. Ileostomies can be of various types. The most common has been the end ileostomy, using a technique popularised by Brooke and Turnbull. The loop ileostomy is used to protect diseased areas or surgical procedures distally. The loop-end ileostomy is a stoma that uses the principles of a loop ileostomy but is constructed as a permanent stoma when the mesentery and its blood supply need special protection. The continent ileostomy, a technique devised by the Swedish surgeon, Nils Kock, is an internal pouch that does not require the wearing of an external appliance. Patients with ileostomies do have problems, most often related to maintenance of the seal of the appliance because of poor location or defective configuration of the stoma. Other problems experienced by ileostomy patients involve odour and gas control, because there is no sphincter in the ileostomy. The patients usually can manage these problems by paying attention to foods and medications ingested, by using various deodorant products, and by maintaining meticulous personal hygiene(1).

There are some complications related to site of ileostomy itself which includes parastomal hernia, stoma prolapse, retraction of stoma, local skin excoriation etc. Most of these conditions

require immediate attention and even revision surgery. Stoma is a burden for both the patient and society. It has got a very poor physiological and psychological impact with frequent social consequences. Patients with stoma must adjust to a changed body image (perception of own body), changes in daily routines, changes in lifestyle and social standing(2).

The closure of the stoma though thought to be a minor surgical procedure, yet it may be associated with appreciable morbidity. The traditional concept of timing of closing a temporary ileostomy has been a matter of debate for some time now(3). The rationale of this study is thus to create or determine the optimal time of closure of this temporary ileostomy in order to achieve an improved effect on the outcome of patients with temporary ileostomy.

Material and Methods: The study area was the Department of General Surgery, VMMC and Safdarjung Hospital New Delhi. Patients admitted in VMMC and Safdarjung Hospital, through outpatient department and emergency who underwent laparotomy/planned procedure who required temporary ileostomy. study was carried out total 100 patients. 40 patients in early ileostomy closure group & 60 in delayed ileostomy closure group. This Study was conducted between Jan 2019 to Dec 2019.

STUDY DESIGN A single blinded prospective randomized controlled trial (RCT).

STUDY TECHNIQUE Enrollment protocol followed for this study.

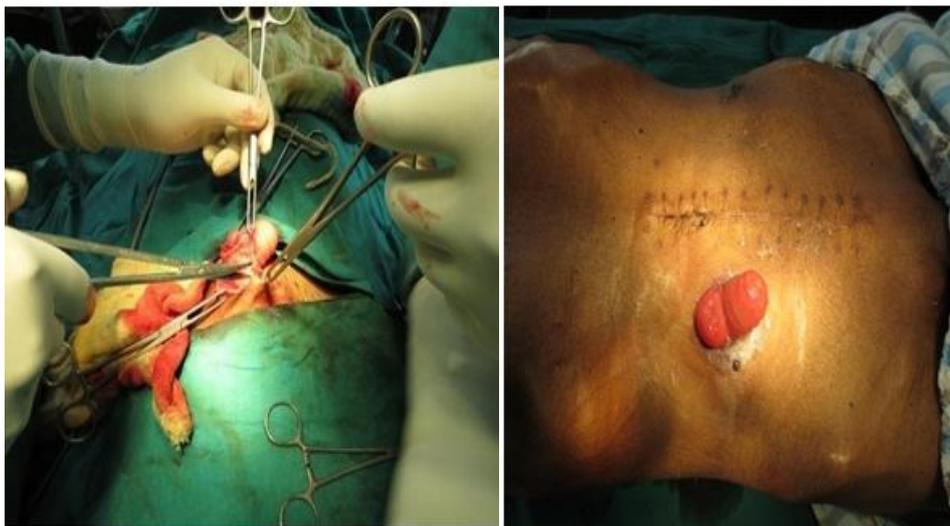
Inclusion Criteria

- *Patients with a temporary ileostomy of diverse etiology.
- *Patients who are physically & mentally fit to undergo surgery within 4 weeks.
- *Patients with clinical Stage-I to Stage-III peritoneal contamination during primary surgery.

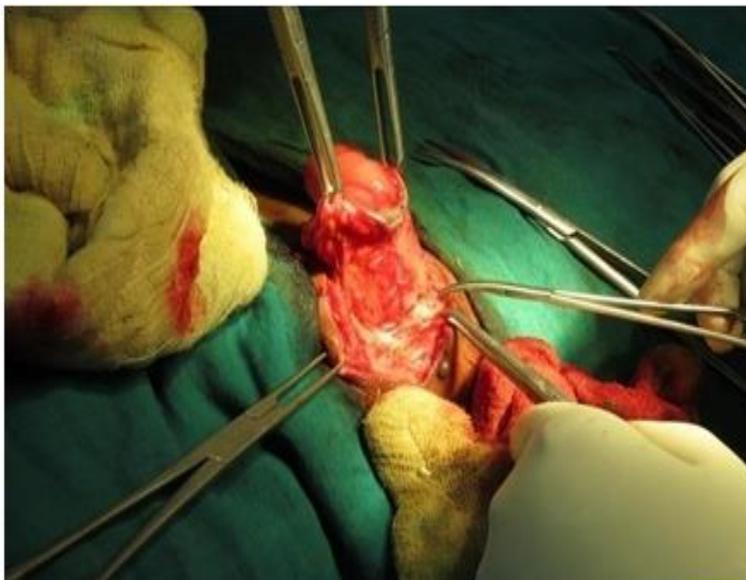
Exclusion Criteria.

- *Patients whose stoma is not reversible.
- *Patients who developed abdominal wall dehiscence after primary operation.
- *Patients with tubercular perforation.*Patients with HIV infection.
- *Circumferential dissection.

Mobilisation of interstinal loop circumferentially.



*Loop ileostomy



Dissection continued until peritoneal cavity is entered.

After closure of the ileostomy, the rectus sheath was closed with a 1-0 polypropylene suture. All the wounds were primarily closed with a 2-0 non absorbable monofilament synthetic suture. These patients, in the postoperative period were observed in the general wards. Nasogastric decompression using a nasogastric tube was not routinely used except in those patients presenting with abdominal distension or persistent vomiting.

All the patients were offered intravenous solutions and antibiotics (2nd generation cephalosporin and Metronidazole). Oral allowance and oral medication was soon added instead of parenteral medication with resumption of bowel sounds. All complications diagnosed within the first 30 days after surgery were included in the present study as morbidity, including those specifically related to the operative procedure.

Statistical Analysis

The record of complications occurring during & after completion of ileostomy closure as reported in patients' record were noted on datasheets and analysed by using Chi Square (χ^2) test and Unpaired t test. All of the statistical analyses were performed using SPSS 10.0 software.

RESULTS**Table1: Age distribution of the patients studied:**

Age groups(years)	Frequency	Percentage
15-25	06	6.0
25-35	16	16.0
35-45	22	22.0
45-55	28	28.0
55-65	20	20.0
65-75	08	8.0
Total	100	100.0

Comment: A total of 100 patients were included in the study. The maximum number of patients were in the age group of 45-55 yrs (28.0%).

Table 2: Sex distribution of the patients studied

Sex	Frequency	Percentage
Male	64	64.0
Female	36	36.0
Total	100	100.0

Comment: Of the total 100 patients included in the study, 64 were male patients and 36 were female patients.

**Ileostomy retraction.****Ileostomy prolapsed.**

Review of Literature

Although the history of colostomy dates back to the early 1700s, the ileostomy is a much more recent event. The first reported creation of an ileostomy was by Baum in Germany in 1879. Baum performed a diverting ileostomy in the treatment of an obstructing right colon cancer. In 1883 Mayd of Vienna, the inventor of the colostomy rod, performed the first successful ileostomy in combination with colonic resection.

Six years later, J.M.T.Finney described the flush-loop ileostomy for the treatment of small bowel obstruction in association with appendiceal abscess(4). Severe skin irritation resulted, and the procedure never gained any popularity.

The widespread use of ileostomy was a result of the work of John Young Brown (1865–1919), a St. Louis surgeon. Minor improvements occurred in the 1930s and 1940s. Rankin of the Mayo Clinic described creating an ileostomy in a separate wound in the right lower quadrant.

The use of skin grafting around the stoma to prevent serositis gained some brief popularity. However, subsequent stenosis of the grafted skin led to ileostomy obstruction and dysfunction, and therefore the idea was abandoned. No significant advances occurred until the 1950s, when Crile and Turnbull of the Cleveland Clinic described ileostomy dysfunction and Bryan Brooke of the University of Birmingham in London described the now famous Brooke ileostomy.

Discussion

Since the first report of this procedure by Turnbull in 1966(28) loop ileostomies gained increased popularity because of its technical simplicity, lack of odour, liquid discharge, decreased rates of stoma related complications(29-34).

Loop ileostomy can be a life saving procedure in the emergency setup. In colorectal surgery, a temporary loop ileostomy is often constructed to protect a distal anastomosis(35). The loop ileostomy is favoured by most surgeons because it is easy to construct(36).

Traditionally restoration of intestinal continuity is usually performed after 8–12 weeks. However, during this time, stoma related complications occur in quarter of patients with adverse effects on quality of life(37,38).

There is debate as to the interval between primary surgery and closure. If attempted too early, patients may not have cured adequately from primary surgery and the stoma will still be edematous(39,40). If however, closure is carried out too late, there may be difficulty with adhesions and the patients quality of life will be affected by a larger period with a stoma.

A prospective study in 2003 showed that earlier reversal of the stoma (11 days rather than 2-3 months) was not associated with increased morbidity or mortality(8).

Overall complication rates after ileostomy closure have been reported to be in the range of 10 to 30%.(41-49) Some authors have reported a higher morbidity after ileostomy closure associated with restorative proctocolectomy than that associated with low colorectal or coloanal anastomoses.(41-46) Perez et al(48) in their study confirm the same thing. Complication rates for the reports by Van de Pavoordt et al(41) and Phanget al(49) were 17 and 28% respectively.

In the present study, most of the complications in two groups were statistically insignificant. Stoma related complications were seen more commonly among delayed ileostomy closure group e.g. stoma prolapse seen in 11.66% of patients of DC group in comparison to none in EC group, stoma retraction seen in 3.33% patients of DC group in comparison to none in EC

group although the difference recorded were statistically insignificant. Among intraoperative parameters intraoperative adhesion was significantly higher in delayed ileostomy closure group (38.33%) with a p value of 0.0096. Operative time for stoma closure was marginally high in delayed closure group (mean 78min) compared to early closure group (mean 76.12min), which was not statistically significant. Among postoperative complications incidence of skin excoriation was higher in delayed closure group (35%) compared to early ileostomy closure group and it was statistically significant ($p=0.0226$). The frequency of ileostomy wound closure site infection was slightly more in early ileostomy closure group (25.0%), but it was not statistically significant. In a study conducted by Alves et al (39) in the early closure group frequency of wound infection was published higher (17%). Incidence of anastomotic leak in this study was 5%, all of which were promptly diagnosed & intervened. Unfortunately one patient expired due to sepsis. Other parameters like incidence of wound dehiscence, fecal fistula & intestinal obstruction were all studied among post operative morbidity. In the present study, all parameters were slightly higher in delayed closure group. Mean length of hospital stay was found to be longer in the delayed closure group than in the early closure group. The difference between two groups was statistically significant ($p<0.0001$). These figures may vary results from other parts of the world (52). Whether the disease process or the lack of technique could alter the outcome following closure of these stoma can be debated.

Conclusion

In conclusion, from reports of our limited experience with both methods early closure of temporary loop ileostomy within 4 weeks shows no significantly increased morbidity except increased wound infection. Routine allocation of patients with temporary loop stomas to early closure could improve patient well being.

The routine practice of reserving patients to prolonged stoma care should be individualised and future studies on comparison of disease specific outcomes of closure are warranted.

References.

1. Everett WG. Suture material in general surgery. *Prog Surg* 1970; 8:14 – 37.
2. Hulten L, Kewenter J, Persson E, Ahren C. 1970 Vitamin B12 absorption in ileostomy patients after operation for ulcerative colitis. *Scand J Gastroenterol*; 5:113–116.
3. Kock NG. 1973 Continent ileostomy. *Progr Surg*; 12:180–201.
4. Hill GL. *Ileostomy: Surgery, Physiology, and Management*. New York: Grune and Stratton, 1976:65.
5. Wara P, Sorensen K, Berg V. Proximal fecal diversion: review of ten year's experience. *Dis Colon Rectum* 1981; 24:114-9
6. Fasth S, Hulten L. Loop ileostomy: a superior diverting stoma in colorectal surgery. *World J Surg* 1984; 8:401-7
7. Williams NS, Nasmyth DG, Jones D, Smith AH. Defunctioning stomas: a prospective controlled trial comparing loop ileostomy with loop transverse colostomy. *Br JSurg* 1986; 73:566-70
8. Van de Pavoordt HD, Fazio VW, Jagelman DG, Lavery IC, Weakley FL. The outcome of loop ileostomy closure in 293 cases. *Int J Colorectal Dis* 1987; 2:214-7
9. Ladas SD, Isaacs PE, Murphy GM, Sladen GE. Fasting and post-prandial ileal function in adapted ileostomates and normal subjects. *Gut* 1986; 27: 906–912.
10. Soper NJ, Orkin BA, Kelly KA, Phillips SF, Brown ML. Gastrointestinal transit after proctocolectomy with ileal pouch-anal anastomosis or ileostomy. *JSurg Res* 1989; 46:300–305.
11. Lewis P, Bartolo DC. Closure of loop ileostomy after restorative proctocolectomy. *Ann R*

- Coll Surg Engl 1990; 72:263-5
12. Winslet MC, Barsoum G, Pringle W, Fox K, Keighley MR. Loop ileostomy after pouch-anal anastomosis– is it necessary? *Dis Colon Rectum* 1991; 34:267-70
 13. Hosie KB, Grobler SP, Keighley MR. Temporary loop ileostomy following restorative proctocolectomy. *Br J Surg* 1992; 79:33-4
 14. Wexner SD, Taranow DA, Johansen OB. Loop ileostomy is a safe option for fecal diversion. *Dis Colon Rectum* 1993; 36:349-54
 15. Senapati A, Nicholls RJ, Ritchie JK, Tibbs CJ, Hawley PR. Temporary loop ileostomy for restorative proctocolectomy. *Br J Surg* 1993; 80:628-30
 16. Cheape JD, Hooks VK. Loop ileostomy: a reliable method of diversion. *South Med J* 1994; 87:370-4
 17. Irving M, O'Dwyer S. Surgical management of anastomotic and intra- abdominal sepsis. In: Fielding LP, Goldberg SM, eds. *Surgery of the colon, rectum and anus*. London: Chapman & Hall Medical, 1996: 93- 104.
 18. Tang CL, Yunus A, Leong APK, Seow-Choen F, Goh HS. Ileostomy output in the early post-operative period. 1998 *Br J Surg*; 82:607–608.
 19. Huber F-X, Stern J, Hinz U, Werle E, Haack D, Kienle P, Heuschen U, Aulmann M, Decker-Baumann C, Herfarth C. Effects of restorative proctocolectomy on renal and adrenal function. *Dis Colon Rectum* 1999;42:1318–1324.
 20. Montgomery RK, Mulberg AE, Grand RJ: Development of the human gastrointestinal tract: Twenty years of progress. *Gastroenterol* 116:702, 1999. [PMID: 10029630]

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