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Original Article

Outcome of Early and late closure of diversion ileostomy after laparoscopic low anterior resection- A retrospective study of 17 patients

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Abstract

Introduction: After laparoscopic low anterior resection surgery, diversion ileostomy is a conceded procedure. However, reversal time of diversion ileostomy is still arbitrary. Ileostomy affects the patients' Quality of Life and demands reversal but short gap between two surgeries is very crucial particularly for elderly patients.

Methods: This is a retrospective study. Data of eighteen patients, who underwent anterior resection for rectal tumors and diversion ileostomy were collected. The study was conducted at Popular Medical college Hospital in Dhaka, Bangladesh between March 2018 and January 2022. The patients were divided in Early Closure and Late Closure groups.

Results: Early closure (mean interval time was 16.5 days) of covering ileostomy was undertaken among 9 patients. Among them. three developed surgical site infection following ileostomy reversal and no other major complication was experienced by any of them. On the other hand, 8 patients were destined to undergo ileostomy closure after 3 months of initial surgery. Of these 8 patients, 6 patients underwent ileostomy closure without any anastomotic stricture related problem. One patient endured anastomotic stricture but that was managed by pre and post reversal dilation. Another patient sought ileostomy reversal surgery after 6 months of initial surgery, but ileostomy reversal was not attempted due to the development of severe anastomotic stricture.

Conclusion: This study statistically cannot conclude that, early closure gives a better outcome. However, the chance of developing anastomotic strictures (benign) is more, if the site of anastomosis left nonfunctional for long.

Keywords: Diversion ileostomy, Ileostomy reversal, anastomotic stricture.

Background

Diversion Ileostomy (DI) is well accepted procedure to prevent anastomotic leakage after Low anterior resection (LAR) [1,2]. There is no consensus regarding the best timing for temporary stoma closure after LAR. Customarily, ileostomy closure has been under taken after one and half months of first surgery. However, some complications like para stomal skin excoriations, leaking from stomal bag and stoma related psychosis affect the paint's quality of life and prolong hospital stay [3-10]. DI may cause major psychological and physical stress thus; patients often request an earlier reversal. It has been observed that stoma psychosis drops remarkably if it has been reversed early [11-13]. Nonetheless, reversal surgery is not immune from complications. On an average in 4.5% cases develop major post-operative complication and minor complication occur in 4% to 30% cases[14]. Although colorectal surgery has been proven to be safe in elderly patients, second surgical interventions within a short period of time may jeopardize the health in patients

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with poor general health[15].A multicenter randomized control trial inferred that rates of severe post-operative complications in both early closing (8–13 days) of ileostomy after rectal resection and late closure (12 weeks after initial surgery) of ileostomy after rectal resection are almost similar. Therefore, the reports on early versus conventional stoma closure are conflicting[16, 17, 18]. Our current study is aimed to evaluate whether the early closer (before 30 days of initial surgery) of DI after LAR, outweighs the morbidities of conventional closer (after 6 weeks of initial surgery) of DI.

Method

In this retrospective study, data of eighteen patients, who underwent anterior resection for rectal tumors and diversion ileostomy at the Popular Medical college Hospital in Dhaka, Bangladesh between March 2018 and January 2022 were collected. Traditionally, stoma closure has been carried out 6 weeks after initial surgery, we have divided our patients into two groups. Those who had the closure within 3 weeks of initial surgery had been grouped as Early Closure (EC) group (9 patients) and who had closure 3 weeks after the first surgery labeled as Late Closure (LC) group (8 Patients) and another patient did not get her stoma reversal between aforementioned period due to development of anastomotic site stricture. Complication related data of the patients had been collected up to six months after second surgery. Among these 18 patients, 6 patients (Four belonged to EC group and other two belonged to LC group) had received neo-adjuvant chemo-radiotherapy. Low anterior resection was performed with total mesorectal excision. End-to-end anastomosis was performed using the Circular GI Stapler. In all eighteen cases Diversion Ileostomy was performed. Enhanced recovery after surgery (ERAS) protocol had been followed in every patient. Water intake was usually allowed on the first postoperative day, and oral intake of solid food was initiated from the second postoperative day. Typically, we closed the defunctioning ileostomy within 3–6 months after the initial operation; however, no stipulated guideline currently exists regarding interval of ileostomy closure Barium enema study had been carried to test the integrity of anastomosis, The procedure for ileostomy closure began with an elliptical skin incision around the ileostomy. After that ileal stoma has been mobilized from the anterior abdominal wall. After trimming the exteriorized ileal external ileal wall, it has been closed by absorbable suture material in interrupted sero-muscular bites.

Incidence of postoperative complications according to the Clavien-Dindo Classification, in both early closure and late closure groups were compared using Fisher's exact test. The p value <0.05 was considered statistically significant. As the sample size was small, no other multivariate analysis was undertaken. EZR version 1.40 was used for statistical analysis.

Result

The mean age of the patients was 51 years, and 59.6% patients were male (Table I). Patients who had been diagnosed with early rectal cancer had only been included in this study, and they were treated with laparoscopic low anterior resection. Stoma closure within 21 days (EC group) was performed in 9 (62%) of 17 cases. The mean interval time between initial surgery and stoma closure was 78.38 days [range; 15–371 days]. The mean time to stoma closure was 16.5 days (range: 15–21 days) and 158 days (range: 91–371 days) in the EC and LC groups, respectively.

Table I : *Clinical cues of the patients*

	Total (N-17)	Early closer Group (N-9)	Late closer Group (N-8)
Age- Median (range) yrs	55 (17-)	53(17-65)	55(46-82)
Sex- Male/Female	10/7	6/3	4/4
Duke staging of the tumor			
Stage-A	10	6	4
Stage-B	7	3	4
Stage-C	0	0	0
Neo-adjuvant treatment	17	9	8
Interval between 1st and 2nd surgery in days mean(range)	78.38 (15-371)	16.5 (15-21)	158 (91-371)

Table II : *List of complications*

Complication after 1st Surgery (Laparoscopic LAR)			
Complication	Total (N-17)	Early closer Group (N-9)	Late closer Group (N-8)
Surgical Site Infection	4	2	2
Paralytic Ileus	1	0	1
UTI	2	2	0
Basal Atelectasis	2	2	0
Stomal Site Skin Excoriation	4	1	3
Stomal Prolapse	1	0	1
Para-stomal hernia	1	0	1
Stoma related psychosis	2	0	2
Complication after 2nd Surgery (leostomy Closure)			
Complication	Total (N-17)	Early closer Group (N-9)	Late closer Group (N-8)
Stoma reversal site wound infection	5	3	2
Post ileostomy reversal diarrhea	4	2	2
Anastomotic Stricture (benign)	1	0	1

After initial surgery, postoperative complications developed in 11 (61%) of 18 patients; however, there were no surgery-related deaths (Table II). Among these 11 patients, within 3 weeks of first surgery: 9 patients suffered from the complications related to the surgery, such as Superficial Surgical Site (4 patients), Paralytic ileus (1 patient), Urinary Sepsis (2 patients), Basal Atelectasis (2 patients) stoma site skin irritation (4 patients). No complication exceeded the Clavien Dindo grade-I in patients who belong to early closer group. However, the patients who had been carrying the stoma more than 2 months faced some other complications like stomal prolapsed (1 patient) and parastomal hernia (1 patient) and stoma related psychosis (2 patients). Stomal prolapsed and parastomal hernia had been managed by doing stomal reversal and psychosis was managed by anti-depressants. In addition, one patient had not got her stoma reversal due to development of anastomotic site benign stricture.

After the second surgery the patients of early closure group did not experience any major complication. Three patients had wound infection and 2 patients developed post ileostomy reversal diarrhea. All these complications had been managed without any major intervention. On the other hand, among the late closure strata, two patients needed to receive antibiotic for surgical site infection and 2 patients received some conservative treatment for post stoma reversal diarrhea. Amongst the 8 patients who were destined to undergo late stomal closure, one patient endured anastomotic site stricture that had been managed by dilation treatment. One patient who got included in our study but cannot be stratified in any group as her diversion ileostomy never been reversed due to severe anstomotic stricture (benign) that revealed after obtaining distal loopogram. This patient had received 6 cycles of adjuvant chemotherapy and after that she sought for ileostomy reversal 6 months after 1st surgery. Strictureplasty was attempted through anus. However, it could not be done.

Discussion

Very few studies have described a link between closing time and morbidity. Only one prospective randomized trial clearly showed a higher incidence of stoma-related morbidity and a higher rate of minor postoperative complications in the group where the stoma was closed after about two months. The study showed no difference in mortality or in the number of complications requiring reoperation[19]. Our retrospective study showed no association between the early closure and development of major complications. However, EC is

likely associated with higher occurrence of minor complications (SSI-33% in EC group and 20% in LC group). This finding has also been reflected in the study of Danielsen A K et al [20]. One explanation for this could be patients who underwent early stoma closure could have had a worse general condition, or local inflammation around the stoma, leading to the high incidence of minor postoperative complications. A clinical trial (Bausys A et al) demonstrated that stoma closure at 30 days after the initial operation increased the rate of severe postoperative complications when compared with that of late stoma closure[21]. However, our study does not corroborate the findings. In our study it has been observed that after the initial surgery the patients (37%, 3 out of 8) of LC group ran into some major complications like Parastomal hernia or stomal prolapse. On the other side, in case of EC group no patient developed such a kind of complication. Figueiredo M. N. et al in their study also postulated that the chances of parastomal hernia and peristomal evisceration are higher in the patients who underwent closure of loop ileostomy before 60 days in comparison to the patents who underwent closer of ileostomy after 60 days[22]. The most thought-provoking finding in our study that, we came across two patients who developed stenosis at the anastomotic site underwent or attempted ileostomy closure after 120 days. One patient developed stricture that was pinned down by loopogram before going for ileostomy closure, and another patient sustained stricture at anastomotic site that revealed after reversion of ileostomy. Zhang H. et al in their multivariate analysis have concluded that preventive ileostomy was the only factor associated with stenosis both in patients receiving preoperative radiotherapy and without radiotherapy[23]. Non-reversal ileostomy and long time between ileostomy and restoration increased the possibility of stenosis. The small number of patients and unpoised comparison between the two groups are the weak points of this study. As the occurrence of postoperative complications is intricate, a simple comparison may exaggerate the differences. Thus, we focused on the statistical comparison of severe complications, resulting in the obscurity of other complications.

Conclusion

Prolong gap between two surgeries (after three months or more) may end up with some crippling complications like benign anastomotic site stenosis and stomal prolapse. Contrary, some early closure patients experienced SSI and two consecutive surgeries within 3 weeks cannot be withstood by the frail patients. However, more studies would be necessary to figure out the optimum period in between two surgeries.

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