Same Admission Closure of Temporary Bowel Stomas: Feasibility and Outcomes

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ABSTRACT

Background/Aim: This pilot study was designed to investigate the feasibility to close protective loop stomas during the same hospital admission based on data on morbidity and mortality, health-related quality of life and healthcare-related costs shortly after the initial operation as well as to find out the causes that delay the closure and to compare the same admission closure with the delayed closure.

Methodology: We created a temporary small bowel stoma due to various pathology and these patients were divided into two groups i.e one with early closure group (same admission closure within 2-3 weeks and late closure group more than 12 weeks and the results were compared.

Results: In our study early stoma closure was performed in 20 patients, 6 women and 14 men with mean age 35 years at 16.0 ± 2.8 days after first operation, late closure was performed in other 25 patients, 8 women and 17 men with mean age 32 years. The average hospital stay was comparable between the 2 groups 11.62 ± 9.8 days after late closure and 9.5 ± 5.0 days after early closure. Stoma related complications were reported more in delayed closure group as compared with early closure group.

Conclusions: Based on our study and results obtained, in our opinion in otherwise fit and healthy patients with normal wound healing, early stoma closure in same admission stay after first operation is better option. Not only does it reduce hospital stay also ensures early return to work.

Key words: ileostomy, bowel stoma, early stoma closure

INTRODUCTION

Temporary diverting enterostomy is the standard of care for a variety of traumatic and non-traumatic intestinal pathologies. Diversion of the fecal stream by construction of a stoma is still a common procedure in bowel surgery especially in emergency, despite a trend to avoid stomas. (1,2) In elective surgery

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or in emergency surgery if the local or general conditions are unfavourable a temporary ileostomy or colostomy often is constructed to protect a distal anastomosis. However, it is associated with a well-recognized morbidity, cost and unproven need for a long delay until closure.

The overall morbidity (e.g. leakage around the appliance, skin dermatitis, high output and prolapse) associated with the construction and takedown of a ileostomy or colostomy varies between different authors and ranges between 10.8 and 69%. (3,4) This morbidity has an effect on patient's health and psychology, postoperative hospital stay, in-hospital costs (5) and quality of life.

Several individual factors are related to the individual's adaptation to life with a stoma including age, (6) socio-economic profile, (7) personality (8) and sex. (9) Studies have shown inferior quality of life in patients with a stoma compared with those who underwent similar procedures without stoma formation. (10-14)

Stoma closure is a frequently performed procedure for temporary enterostomy in surgical practice. Reversal of a temporary ileostomy is generally associated with a low mortality. (15) However, ostomy reversal may cause complications requiring reoperation, and a recently published review found major complications ranging from 0% to 7–9% and minor complications varying from 4–5% to 30%. (16) Although reversal of the temporary stoma resulted in an increase in quality of life. (10)

This temporary stoma is usually closed 9 to 12 weeks later (17) although currently there is no evidence that this period is required for complete healing of the bowel anastomosis. (18,19,20)

In a developing country like India, enterostomies are ill managed by the patients due to poor education, poverty and unreliable supply of collecting appliances. Therefore, early closure of the stoma could be considered if the patient is physically fit to be operated on again.

This pilot study was designed to investigate the feasibility to close protective loop stomas during the same hospital admission based on data on morbidity and mortality, health-related quality of life and health-care-related costs shortly after the initial operation as well as to find out the causes that delay the closure and to compare the same admission closure with the delayed closure.

METHODOLOGY

Between October 2004 and October 2005, in the

Department of Surgery, Gandhi Medical College and associated Hamidia Hospital Bhopal, We created a temporary small bowel stoma in 51 patients and closed in 45 patients, 18 women and 27 men, mean age 33.5 years (range 24-83). 16 patients had a loop ileostomy above a distal anastomosis because of Typhoid perforation, after traumatic perforation (N = 7), for bowel ischemia (N = 5) or tuberculous perforation (N = 3) and sigmoid volvulus (N = 4), for caecal perforation (N = 4) or others (N = 6).

The cases were closely monitored in the postoperative period after stoma formation and were evaluated for their fitness for early closure, regularly after the 7th post operative day. When a patient was found fit for early closure the distal loop contrast study was done with a water-soluble contrast one day prior to operation.

Patients with age 12 years or below, with non-healing of distal bowel perforation or with persistent postoperative instability or poor general condition, stoma with mucous fistula, steroids in postoperative period or with wound Infection were excluded from early closure group. Patients receive complete oral and written information about the trial, and a written consent has to be signed.

Patients in the intervention group will have the stoma reversed 14-21 days after stoma creation, and patients in the control group will have the stoma reversed after a minimum of 12 weeks.

Closure was performed under general anesthesia with similar prophylactic antibiotic at the time of the incision was given. The elective incision was associated with resection of the stoma and bowel anastomosis or simple closure and closures is done in double layer with 3-0 polyglactin acid thread, the skin was closed with a loose suture.

Per operative blood loss and the time taken for surgery were recorded. In post operative period patients course were recorded. In follow up the patients were routinely called two weeks after the discharge and then monthly for three more months then 6 monthly. All patients will be monitored closely in relation to complications, health-related quality of life and costs.

RESULTS

Early closure was performed in 20 patients, 6 women and 14 men, mean age 35 years (range 26-83) at 16.0 ± 2.8 days after the first operation. The closure was performed in 2 nd week (N = 13) and 3 rd week (N = 7).

Late closure was performed in the other 25 patients, 8 women and 17 men, mean age 32 years, (age range 26-58) 12.2 ± 3.7 weeks after the initial operation. Various factors were responsible for delayed closure (*table 1*).

The mean operative time taken was 96 ± 3.15 mins in delayed closure group and 84 ± 5.85 mins in early closure group (p value < 0.0001). Mean per operative blood loss was 44 ± 4.8 ml in delayed closure group and 46 ± 4.2 ml in early closure group (p value = 0.15) (*table 2*).

The average hospital stay after closure was comparable between the two groups: 11.62 ± 9.8 days after late closure and 9.5 ± 5.0 days after early closure. Total mean hospital stay, calculated from the date of the initial admission, was longer in the late closure group (36.9 ± 12.6 days for two stays, 24.3 ± 13.6 days and 11.6 ± 9.8 days) than in the early closure group (30.1 ± 8.6 days in one stay) (*table 2*).

There were 3 patients in delayed closure group presented with leak and none from early closure group (p value = 0.24). This leak was not from anastomotic dehiscence but a missed iatrogenic tear, which was perhaps made during the dissection. Wound infection presented in 6 patients in delayed closure group and 3 patients in early closure group (p value = 0.71). 1 patient presented with small bowel obstruction in delayed closure group and 1 patient presented with small bowel obstruction and 1 with chest infection in early closure group and there was no mortality after closure of stoma in any of the group (*table 2*).

Stoma related complications were reported in 18 patients in delayed closure group and in that parastomal skin excoriation/erythema ($n = 13$) is most frequently encountered stoma related complication

Table 1 - Showing various factors that led to delay in closure

Causes	Cases	Percentages
Wound infection	9	36
Low BMI	5	20
Chest Complications	4	16
Hypoproteinemia	3	12
Distal Bowel Leak	2	8
Deranged Renal Function	1	4
Not giving Consent	1	4

■ Wound infection ■ Low BMI ■ Chest Complications
 ■ Hypoproteinemia ■ Distal Bowel Leak ■ Deranged Renal Function
 ■ Not giving Consent

and in 7 patients in early closure group (p value = 0.018) (*table 3*).

DISCUSSION

An intestinal stoma is an opening of intestine on the anterior abdominal wall made surgically. (21) Stoma creation is a treatment that eliminates disease, relieves pain and improves health, whereby stoma creation may also have a positive impact. (22) Shock, marked blood loss, significant faecal contamination, associated injuries, time till presentation and multiplicity of injury

Table 2 - Comparing various parameters between delayed vs early stoma closure group

Group	Delayed closure group	Early closure group	p value *
Total patients	25	20	
Mean operation time (in mins)	96 ± 3.15	84 ± 5.85	< 0.0001
Mean per operative blood loss (in ml)	44 ± 4.8	46 ± 4.2	0.15
Average hospital stay after closure (in Days)	11.62 ± 9.8	9.5 ± 5.0	0.38
Total mean hospital stay (in Days)	36.9 ± 12.6	30.1 ± 8.6	0.046
Stoma leak	3	0	0.24
Wound infection	6	3	0.71
Small Bowel Obstruction	1	1	1
Chest Infections	0	1	0.44
Mortality	0	0	1

* p value < 0.05 is statistically significant

Table 3 - Comparing stoma related complication between delayed vs early stoma closure group

S. NO.	Complication	Delayed closure group	Early closure group	p value*
1.	Parastomal skin excoriation/erythema	13	3	
2.	Hypocalcemia	1	1	
3.	Parastomal Hernia	1	0	
4.	Prolapse	1	2	
5.	Dehydration	1	1	
6.	Psychosis	1	-	
	TOTAL	18	7	0.018

* p value < 0.05 is statistically significant

are important factors favouring stoma formation than primary repair. (23) A stoma can produces social, domestic and psychological upsets. These can be early including metabolic derangements, skin irritation, ischaemia and stoma retraction. Late complications are parastomal hernia, prolapse and stenosis. Parenteral nutritional support may also be needed if the stoma is very proximal, with the infectious and other risks related to insertion of a central venous catheter. The different problems encountered in these patients prompted us to undertake this study of early stoma closure in selected patients. Two prerequisites had to be met in our study. First the closure had to be performed late enough to allow the anastomosis to heal (protective role of the stoma). The risk of anastomotic leak is maximal from day 5 to day 7 postoperatively. (24) Likewise; the stoma had to be closed early enough to avoid excessive postoperative inflammatory reactions which could compromise peristomal dissection. We thus choose 14 days as the average delay before stoma closure. Using this time, we found that, despite the selection bias which excluded patients with a high risk of leak, early closer of small bowel stomas is feasible and that it significantly reduces the total duration of hospitalization without increase in morbidity and mortality. We reported significantly less operative time, insignificantly more blood loss and higher chest complication in early stoma closure group as compare to delayed closure group. We found a higher rate of wound infection after late closure than after early closure as against study by Velmahos et al. (25) This difference was not significant in our study, but probably only because of the small number of patients in each group. There is also significantly higher stoma related complications reported in delayed closure group as compared to early closure group.

CONCLUSION

Same admission ostomy closure is based upon sound principles. Collagen synthesis and content of stoma wound are optimal, seven to eleven days after the stoma construction. Closure of ostomies during this proliferative phase of wound healing will ensure better anastomotic healing and strength. Hence, after radiological confirmation of the healing of the primary process or injury distal to the stoma, same admission closure can be safely undertaken one week after stoma construction. Delayed (after 8 weeks) closure has been practiced to date to ensure repletion of lean body mass, resolution of peritonitis, sepsis, and inflammation in the region of the primary pathology, and healing of anastomosis or injuries distal to the stoma.

In our opinion, in otherwise fit and healthy patients with normal wound healing same admission closure is an attractive option. Not only does it reduce hospital stay but also ensures early return to work. Even more important, in developing countries where healthcare systems are not well established and poverty is rife, same admission closure ensures that patients never have to learn stoma care, purchase appliances or deal with stoma related problems chores.

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