

IS EARLY CLOSURE OF STOMA WARRANTED IN THE MANAGEMENT OF TEMPORARY LOOP ILEOSTOMY?

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ABSTRACT

Objective: To assess the outcome of closure of temporary loop ileostomies by comparing frequency of post operative complication.

Methodology: This was an experimental study conducted at the surgical A unit of Lady Reading Hospital Between Jan 2005 and Dec 2009. All patients who were primarily operated and ended up with temporary loop ileostomy were admitted via the out-patient department. Consecutively allocated into group A whose stomae were closed at 8 weeks and group B whose stomae closed at 4 weeks. Postoperative complications including wound infection, anastamotic leak, dehiscence etc. were recorded and statistical analysis done using version 13.0 SPSS for windows.

Results: Group A included 155 patients and Group B 156 patient with male predominance in both groups ($p=0.869$). The mean age in both groups was similar 33.6 years and 32.7 years respectively. Anastamotic leak rate and wound dehiscence was lower in early closure group but p value was insignificant. The frequency of wound infection was higher in the early stoma closure group ($p=0.001$). The mean hospital stay was similar.

Conclusion: Apart from wound infection the frequency of complication following early closure (4 weeks) of temporary loop stoma is similar to delayed closure. Thus delayed closure of stomae should be abandoned.

Key words: Intestinal stoma, Early, Closure.

INTRODUCTION

Since the introduction of the formation of a small bowel stoma as a diverging procedure to buy time for healing of a pathological process distal to the exit of the proximal effluent, many concerns over the associated morbidity have been varyingly raised in literature¹. With its use by surgeons all over the world and evolving trends regarding the care of stomae, there seems to be great concern on part of the patients and primary health care providers in avoiding the untoward effects of the procedure. Late but fortunate, the emergence of stomae in the third world countries and developing nations has changed the face of the outcome and results of the disease process². For indications like enteric perforation, trauma, distal primary anastamoses etc. the survival rate has dramatically improved^{3,4}.

There are however exhibitions of queries regarding the timing of closure of these proximal diversions⁵. This greatly influences those patients not gaining adequate access to primary health care facilities equipped to manage a safe and socially acceptable stoma. Conditions such as associated nutritional imbalances, metabolic derangements and skin excoriation being only some of the common reasons patients attempt access to tertiary care setups for management increasing burden on the health care budget⁶.

The concept of a mature and adequately safe closure of such stomae has been a matter of debate for some time now. With no meta-analysis determining the safety and recommendations determining the prime time for closure of temporary diversions of small bowel the need to discard the otherwise concept of a 8-12 week

mature stoma, some authors have even provided evidence of safety of closure as early as 10 days postoperatively⁷.

A temporary loop ileostomy is a morbid condition in itself with skin problems, application and cost of stoma devices, lack of working ostomy associations and social/psychological discrimination severely affecting the quality of life. The rationale is thus clear as to create or determine an optimal time for closure of these stomae in countries; where by the lack of facilities and associated morbidities be tackled by early closure exhibiting an improved effect on outcome of the primary disease process.

METHODOLOGY

All patients between January 2005 and December 2009, presenting with a temporary loop ileostomy were included in this experimental study, that was conducted at the present surgical 'A' Unit at Lady Reading Hospital Peshawar. Documents and records were obtained with clear confirmation of the operative steps undertaken and the reason for previous study. Also recorded data on preoperative weight, proximal gut length was obtained from discharge cards. These data were recorded on the proforma of each patient during their hospital stay.

All patients above the age of 18 years with a temporary loop ileostomy presenting during follow-up were enrolled in our out-patient department. They were grouped by non-probability (consecutive) sampling in two groups. In Group 'A' we included all patients scheduled to be candidates for reversal of their stomas at the conventional period of 8 weeks following their first surgery. In the other group 'B' we included patients who would be candidates to have their stomas reversed at 4 weeks following their primary surgery. Those patients with postoperative stomas who had repeated complications of stoma or more than one stoma were excluded from the study. So were patients with large bowel stomas and permanent and end stomas excluded from the study.

The number of patients included in the study was calculated using the sample size calculator software 2.0 recommended by the World Health organization. This value was exclusive of all patients that were lost to follow-up and thus 155 patients were included in both groups.

The permission from ethical committee of our hospital was taken prior to any data collection or enrollment and a written consent was obtained from the patients. Both patient and surgeon were blinded about the status of cases and their presence in the study. Only the most senior consultants with minimal experience of ten years were part of team.

These patients were called to respective dates and put on the next operative list.

Following admission they were investigated with a distal loopogram (distal segment contrast) study. This was to evaluate any distal obstruction. Apart from that, routine investigations like hemoglobin, electrolytes, serum proteins, chest X-ray, blood urea, serum creatinine etc. were performed to rule fitness and risk of surgery.

The operative technique was clearly the same for both groups where through the same stoma site stoma was released along with elimination of adhesion and single layer extramucosal anastomosis with 3/0 vicryl was performed. The stoma site was repaired with prolene 1 to avoid a defect in the abdominal wall. No attempt was made to close the skin site to avoid risk of developing operative site SSI's.

These patients, in the postoperative period were observed in the general wards under care of their respective attending surgeons. Nasogastric decompression using a nasogastric tube was not routinely used except in those patients presenting abdominal distension or persistent vomiting. Prophylactic antibiotics were not according to a fixed protocol but anaerobic cover using Metronidazole during stay was given to all patients. Intravenous fluids were given until resumption of oral fluids. Oral allowance and oral medication was soon added instead of parenteral medication with resumption of bowel sounds and passage of flatus.

All this data and the postoperative complications including leak and wound infection was recorded on a pre-formed proforma. The diagnosis and investigations pertaining to diagnosing complications was decided by the attending surgeon. This was recorded by the attending surgeon on day 5 post-operatively or on day of discharge if stay was less than 5 days. Then a final follow up at 30 days was performed and data again recollected in the outpatient department.

Using version 13.0 of SPSS for windows, all data was recorded and analyzed. All categorical data was compared between groups using chi-square test and all continuous data was compared between groups using the student-t test. *p* values less than 0.05 was considered significant and represented in tabulated form.

RESULTS

During four years of this prospective interventional study conducted at Surgical Unit 'A' at Lady Reading Hospital 311 patients were consecutively enrolled into the study and were

alternately allocated into two groups. One hundred and fifty five patients were part of group 'A' which were asked to return for reversal of their stomae at 8 weeks from its formation where as the other group 'B' was asked to return to reverse their stomas after 4 weeks. Demographically both groups were similar with a male predominance in both group and statistically insignificant differences rendering both groups similar with no confounding figures for both gender and age.

To avoid biasing patients based on their clinical presentation preoperative weight loss and proximal gut length were also compared with statistically insignificant results again rendering both groups comparable and eliminating bias. The average gut lengths in both groups were well recorded and found above any potential to cause short gut syndrome. Thus a lower number of patients presented with weight loss greater than 10% (Table 1).

Many of these patients were operated primarily in the emergency department majority as

a part of laparotomies for trauma and enteric perforations that arise secondary to typhoid fever. They are frequently performed in cases where there is fear of a primary repair due to active disease, contamination or lack of expertise. Yet the number of indications in either group was comparatively similar with a p value of 0.866 (Table 2).

Skin excoriation that is frequently observed following the formation of small gut stomae was seen mainly in group 'A' and this figure was statistically also significant. This could in part be due to more duration of exposure to intestinal contents. Neither of the postoperative complications showed significant values following the closure of the temporary stomae. The mortality of both groups was similar and mainly due to high morbidity of the primary disease. In all only three patients expired (Table 3).

The most common complication in both groups following the closure of temporary ileostomies was wound infection and although

Table 1: Preoperative and demographic variables

Variable	Group 'A' n= 155	Group 'B' n=156	P value
Age(years) (s.d)	33.68(11.3)	32.75(11.2)	>0.05 ^T
Gender	Male	86(55.4%)	88(56.41%)
	Female	69(44.51%)	68(43.58%)
Pre-operative weight loss			
<5% of total body weight	58(37.41%)	73(46.79%)	0.09 [?]
5-10% of total body weight	60(38.7%)	66(42.3%)	
>10% of total body weight	37(23.8%)	17(10.8%)	
Proximal Gut Length (cm)(s.d)	217.19(39.2)	214.55(41.49)	>0.05 ^T
Post operative stay (days) (s.d)	5.03(3.55)	4.83(3.46)	>0.05 ^T
Post-op passage of flatus	1.94(2.01)	1.93(2.56)	>0.05 ^T

Chi square test= [?] Student t test= ^T

Table 2: Indications for temporary loop stoma formation

Indication	Group 'A' n=155	Group 'B' n=156
Enteric perforation	74(47.74%)	75(48.07%)
Trauma	63(40.6%)	67(42.94%)
Tuberculosis	04(2.58%)	06(3.8%)
Crohn's Disease	03(1.9%)	01(0.64%)
Ulcerative Colitis	00	01(0.64%)
Colorectal cancer	02(1.29%)	01(0.64%)
Other gut resection	09(5.8%)	05(3.2%)

Table 3: Postoperative complications

Variable	Group 'A' n=155	Group 'B' n=156	P value
Skin excoriation	40(25.8%)	14(8.97%)	0.001 [?]
Wound infection	16(10.32%)	26(16.66%)	0.102 [?]
Wound dehiscence	10(6.45%)	06(3.8%)	0.298 [?]
Anastamotic leak/Fistula	13(8.38%)	9(5.76%)	0.368 [?]
Mortality	01(0.6%)	02(1.2%)	0.566 [?]

Chi square test= [?] Student t test= ^T

higher in group 'B' this was statistically insignificant. There was a lower frequency of wound dehiscence in patients undergoing early closure but this was statistically not proven ($p=0.298$). A lower leak rate was also seen after early closure although the morbidity associated with leak in this group was higher from observing individual cases. ($p=0.368$) (Table 3).

DISCUSSION

Loop stomae can be a life saving procedure in the emergency setup seen from comparison of this study with others as a far share of the procedure along which it was performed was in the emergency department^{8,9}. The query on which time frame is ideal for optimal closure has been recently debated.

In this study there is clear lack of statistical evidence to prove that the conventionally 8 weeks period is superior to an early closure. In a study conducted by Galais et al¹⁰ a similar study design with lower number of patients were observed and there were far higher number of stomas formed at elective setting. If the results from studies conducted by authors such as **Velmahos** et al¹¹ were deceiving a more surprising element in this study was lower frequency of leak in the early group. Yet in both studies the frequency of wound infection was similar despite attempts to delayed closure of skin and avoiding infection. Why the incidence is higher in the early group is debatable, whether due to higher bacterial load or due to virulence of the invading organisms is to be answered¹².

The frequency of leak following closure of stomae in this study is also higher overall than in other studies¹³. This could be mainly due to the indications for formation of the stomae or due to the ongoing disease process¹⁴. In a study conducted by **Krand** et al¹⁵ the frequency of wound infection and leak rate was lower and more so the number of patients included in their study were only 50 patients. The complication rate in both groups in

their study was also similar 16% versus 8%. Much of the recent publications are in favor of early stoma closure as the results of surgery are similar yet avoiding the physical and psychological morbidity of caring for a stoma in communities where stoma-care is lacking¹⁶.

The day at which the recording of data was done is in concordance of a higher frequency of fistula formation or anastamotic leak to be observed on days 5-7 post-operatively¹⁷. This figure was similarly observed in other studies but the rate of fistula or leak in other studies can be deceptive as the number of patients included by most studies was not as significant as in our study^{11,15,16}. The frequency of wound infection was again published higher in a study conducted by **Alves** et al¹⁸ in the early closure group which was 17% this was similar to the infection rate in our study 16.66%. But in our study this was not significant as reported earlier. ($p=0.102$)

Apart from leaks the long term follow up of these patients was required to assess the technical failures during surgery as some patients presented with long term complications of small bowel obstruction¹⁹. This is probably due to a narrow anastomosis at initial closure although a single layer extramucosal technique was used.

The mean time to passage of flatus and resumption of bowel sounds after surgery was comparable to most western studies²⁰; which was similar in both groups and roughly about 2 days post-operatively. The role of routine nasogastric decompression was elucidated in trials in previous years and was not routine practice considering the elective nature of the procedure²¹. Only a small share of these patients required decompression, thus to increase morbidity and duration of hospital stay. The hospital stay in our study was around 5 days in both groups. The difference in both groups was insignificant where by the results from **Galais** et al¹⁰ were different as their patients showed significantly decreased hospital stay amongst patients in the early closure group.

In a recent study conducted locally by Afridi et al²² the most common indication for stoma formation was perforation of small bowel and ileocecal tuberculosis. These figures greatly vary results from other parts of the world²³. Whether the disease process or the lack of technique could alter the outcome following closure of these stomae can be debated. The leak rate in this study overall was higher than in most western studies²⁴. This gives a more clear idea that the primary disease might have much to alter the outcome of stoma closure if such is the case following trauma and enteric perforation. This would require a larger recruit of patients and comparison of disease specific outcome of stoma closure.

CONCLUSION

Early closure of temporary loop ileostomy at 4 weeks shows no significantly increased morbidity except increased wound infection. Routine allocation of patients with temporary loop stomas to early closure could cut costs and improve patient well being. The routine practice of reserving patients to prolonged stoma care should be abandoned and future studies on comparison of disease specific outcomes of closure are warranted.

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