Primary Repair Versus Colostomy in Colonic Injuries

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ABSTRACT

Objective: To compare the primary repair versus colostomy in colonic injuries at tertiary care hospital in terms of morbidity and hospital stay.
Design & duration: This quasi-experimental study was carried out from 27-1-07 to 26-07-07.
Setting: Department of Surgery, Mayo Hospital Lahore.
Patients and methods: Sixty patients presented within 10 hours after penetrating injury and damaged colon part is <1 cm with minimal faecal contamination, were included in the study. The patients who have injury of >2 abdominal viscera, frank faecal contamination, shock and immuno-compromised were excluded from the study. Patients were randomly divided in two groups; Group A (Primary repair), Group B (Colostomy), 30 patients in each group. Follow up in group A patients was done twice after 2 weeks and after one month. Follow up in group B was done for multiple times. Initially the visit was advised after every two week until the patient was called back for colostomy closure.
Results: Out of sixty patients, 27 were males and 3 were females in group A and 28 were males and 2 were females in group B with Mean±SD ages were 28.9±8.1 years and 30.1±14.0 years. Mean hospital stay in group A was 8.9±3.6 days and in group B was 11.0±4.7 days. At two week follow up, in group A there was 1 patient of abscess, 1 patient of suture repair leak, 1 patient of sepsis and 2 patients of wound infection. In group B, there were 2 patients of abscess, 1 patient of suture repair leak, 3 patients of sepsis and 4 patients of wound infection.
Conclusion: It is concluded that primary repair was safe and effective treatment modality in the management of colonic injuries as compared to colostomy.
Key words: Colonic injuries, Primary repair, Colostomy

INTRODUCTION

The morbidity in patients with colon trauma has diminished ever since the first and second World War, this was due to the improvements in pre and post-operative, the advances in antibiotics therapy and the reduction of time between the injury and the surgical intervention.Colon trauma is frequent and its prevalence is difficult to establish because of the different factors that intervene in its origin[1.2]. The surgeons all over the world have been working out different strategies to avoid colostomy and its associated problems. These included primary repair exteriorization of the repaired segment with early drop back and more recently use of intra-colonic bypass tube after repair of left colon and rectum. With improved facilities in patient care and proper use of antibiotics the surgeons today are more included to primary repair of colon[3]. Colonic injury is still widely recognized as one of the most serious intra-abdominal injuries in civilian practice because of lethal consequences of peritoneal contamination. This injury has been associated with a high risk of septic complications and mortality[4]. There is strong evidence that the vast majority of colonic injuries can be safely managed by primary repair. It seems, however, that there is a limited role for colostomy, particularly in high-risk patients with destructive injuries of the left colon[5.]

Early postoperative results after primary repair, and resection anastomosis were good. The primary repair or resection and anastomosis can be performed with acceptable morbidity for perforations of the colon and rectum[6]. The experience of selective primary repair for colonic injuries incorporating a number of procedures. Primary repair was a safe and effective treatment for colonic injuries during war[7]. Primary repair of colonic injuries has less morbidity and is less expensive as compared to colostomy and is ideal method of management for colonic injury[8]. Primary repair is a safe method of managing penetrating colon injuries in carefully selected patients[9]. Penetrating colon injury carries a high rate of infectious morbidity. The development of infectious complications is related to the injury severity and haemodynamic status of the patient, not the type of operation performed[10].

The survival rate in colonic injuries dramatically increased by exteriorization of injury as a colostomy during 1939-45 war and third led to strong support for its extensive use in civilian practice[11]. With advancing age colostomy was accepted as a standard method of management for colonic injuries and in selected cases primary repair with proximal colostomy was adopted as chosen treatment[12]. The colostomy method of treatment has dual purpose. In exteriorization of the colonic injury, possible intra-abdominal sepsis is avoided followed by safe closure later on. In case of primary repair with colostomy, proximal decompression is achieved and chances of failure of anastomosis are eliminated. An exteriorization of primary repair, with subsequent delayed return of the repaired bowel to its intra abdominal location has been proposed as an alternative to colostomy or primary repair. This technique represents an intermediate between primary repair and colostomy. The injured bowel is repaired but is exteriorized on the anterior abdominal wall. It is returned to the abdomen in 5-7 days. Various reports prove above 50% failure with this technique. It requires intensive nursing care and occasionally causes colonic obstruction[13].

PATIENTS AND METHODS

This quasi-experimental study was carried out from 27th January 2007 to 26th July 2007 in the Department of Surgery, Mayo Hospital Lahore. Sixty patients presented within 10 hours after penetrating injury and damaged colon part is <1 cm with minimal faecal contamination were included in the study. The patients who have injury of >2 abdominal viscera, frank faecal contamination, shock and immuno-compromised were excluded from the study. Patients were randomly divided in two groups; Group A (Primary repair), Group B (Colostomy), 30 patients in each group. Post-operative events were recorded till the patient is discharged. Follow up in group A patients was done twice after 2 weeks and after one month. The follow up in group B was done for multiple times. Initially the visit was advised after every two weeks until the patient was called back for colostomy closure. After colostomy closure the patient was advised follow up twice a month for one month. Confounding variables were controlled through matching. At the completion of study data was transferred to the computer and analyzed with the help of SPSS version 12. Student's't' test was applied on hospital stay and time interval between injury and operation to find out the significance between the two groups. Chi Square test was applied on morbidities (abscess, suture repair leak, sepsis and wound infection) to find out the significance between the groups. P value $\leq$0.05 was considered as significant.

RESULTS

Sixty patients were selected from the Emergency Department of Surgery, Mayo Hospital, Lahore. Patients were randomly allocated in two groups Group A (Primary repair), Group B (Colostomy), 30 patients in each group. In group A, there were 7(23.3%) patients in the age range of 15-20 years, 13(43.3%) patients in the age range of 21-30 years, 9(30.0%) patients in the age range of 31-40 years and 1(3.3%) patient of 41-50 years. In group B, there were 7(23.3%) patients in the age range of 15-20 years, 13(43.3%) patients of 21-30 years, 5 (16.7%) patients in the age range of 31-40 years, 2 (6.7%) patient of 41-50 years and 3 (10%) patients of more than 50 years. The mean age in group A was 28.9±8.1 years and mean age in group B was 30.1±14.0 years (Table 1). According to hospital stay, in group A, 6(20%) patients of 1-5 days, 13(43.3%) patients of 6-10 days, 10 (33.3%) patients of 11-15 days and 1(3.3%) patient of 16-20 days. While in group B, there were 3 (10%) patients of 1-5 days, 13(43.3%) patients of 6-10 days, 10 (33.3%) patients of 11-15 days and 4 (13.3%) patient of 16-20 days. The mean hospital stay in group A 8.9±3.65 days and mean hospital stay in group B was 11.0±4.7 days with significant p value of 0.04 (Table 2).

Table 1: Frequency of patients by age

Age (years	Group A (n=30)		Group B (n=30)	
	No.	%age	No.	%age
Upto 20	7	23.3	7	23.3
21-30	13	43.3	13	43.3
31-40	9	30.0	5	16.7
41-50	1	3.3	2	6.7
>50	0	0	3	10.0
Mean±SD	28.9±8.1		30.1±14.0	

Table 2: Distribution of patients by hospital stay

Hospital stay (days)	Group A (n=30)		Group B (n=30)	
	No.	%age	No.	%age
Upto 20	7	23.3	Upto 20	7
21-30	13	43.3	21-30	13
Mean±SD	8.9±3.6		11.0±4.7	

P- value 0.04

The mean time interval between injury and operation in group A 3.4±2.7 hours and mean time interval between injury and operation in group B was 4.5±5.1 hours with not significant P value of 0.26. In group A, there were 21(70%) patients in time interval range of 1-3 hours, 4(13.3%) patients in the time interval range of 4-6 hours and 5(16.7%) patients in the time interval range of 7-10 hours. In group B, there were 17 (56.7%) patients in the time interval range of 1-3 hours, 7(23.3%) patients of 4-6 hours and 6 (20%) patients in the time interval range of 7-10 hours (Table 3). At two weeks follow up, in-group A there was 1 (3.3%) patient of abscess, 1(3.3%) patient of suture repair leak, 1(3.3%) patient of sepsis and 2 (6.7%) patients of wound infection. In group B, there were 2 (6.7%) patients of abscess, 1 (3.3%) patient of suture repair leak, 3 (10%) patients of sepsis and 4 (13.3%) patients of wound infection. At four weeks follow up, in-group A there was 1(3.3%) patient of abscess and 1(3.3%) patients of wound infection. In group B, there were 2 (6.7%) patients of abscess, 1 (3.3%) patient of suture repair leak, 1(3.3%) patient of sepsis and 2(6.7%) patients of wound infection (Table 4).

Table 3: Frequency of patients by time interval between injury and operation

Time (hrs)	Group A (n=30)		Group B (n=30)	
	No.	%age	No.	%age
1-3	21	70.0	17	56.7
4-6	4	13.3	7	23.3
7-10	5	16.7	6	20.0
Mean±SD	3.4±2.7		4.5±5.1	

P value: 0.26

Table 4: Comparison of morbidities at 2 and 4 week follow-up

Morbidity	Group A (n=30)		Group B (n=30)	
	No.	%age	No.	%age
At 2 weeks				
Abscess	1	3.3	2	6.7
Suture repair leak	1	3.3	1	3.3
Sepsis	1	3.3	3	10.0
Wound infection	2	6.7	4	13.3
χ^2: 79.2	P-value: 0.001			
At 4 weeks				
Abscess	1	3.3	2	6.7
Suture repair leak	0	0	1	3.3
Sepsis	0	0	1	3.3
Wound infection	1	3.3	2	6.7
χ^2: 44.6	P-value: 0.001			

DISCUSSION

Colon injury has been associated with a high risk of septic complications and mortality. This study assessed the pattern, management, outcome and prognostic factors in patients[4]. There is strong evidence that the vast majority of colonic injuries can be safely managed by primary repair. It seems, however, that there is a limited role for colostomy, particularly in high-risk patients with destructive injuries of the left colon[5]. Early postoperative results after primary repair, and resection anastomosis were good. The primary repair or resection and anastomosis can be performed with acceptable morbidity for perforations

of the colon and rectum[6]. The experience of selective primary repair for colonic injuries incorporating a number of procedures. Primary repair was a safe and effective treatment for colonic injuries during war[7]. Primary repair of colonic injuries has less morbidity and is less expensive as compared to colostomy and is ideal method of management for colonic injury.[8] Primary repair is debatable; however, in the present antibiotics era, it is safe and less costly than the two-stage procedure of proximal colostomy with repair[14].

In the present study the mean age in group A 28.9±8.1 years and mean age in group B was 30.1±14.0 years. As compared with the study of Kahya et al[15] the mean age of the patients of 30.1 years, which is same and comparable with our study.

In the present study, the mean time interval between injury and operation in group A 3.4±2.7 hours and in group B was 4.5±5.1 hours. As compared with the local study conducted at Lahore General Hospital Lahore by Hussain et al[9] the mean time interval between injury and operation was 7 hours, which is comparable with our study.

In the present study, the mean hospital stay in group A 8.9±3.65 days and mean hospital stay in group B was 11.0±4.7 days with significant P value of 0.04. As compared with the local study conducted at Lahore General Hospital Lahore by Hussain et al[9] the mean hospital stay of the patients was 8 days, which is comparable with our study.

In the present study, in-group A there was 3.3% patient of intra abdominal abscess and in group B there were 6.7% patients of intra abdominal abscess. As compared with the study of Bedirli et al[16] there were 6% patients of intra abdominal abscess complication, which is comparable with our study.

In the present study in group A there were 6.7% patients of wound infection and in group B there were 13.3% patients of wound infection. As compared with the study of Bedirli et al[16] there were 14% patients of wound infection, which is same and comparable with our study. In another study conducted by Busic et al[17] there were 14.3% patients of wound infection, which is also comparable with our study.

In the present study in group A the complication of sepsis was found to be 3.3% patients and in group B there were 13.3% patients of sepsis. As compared with the study of Stagnitti et al[18] the complication of sepsis was found to be 14%, which is comparable with our study.

CONCLUSION

Primary repair group had significantly shorter hospital stay and lesser morbidities as compared to colostomy. Therefore it is concluded that primary repair was safe and effective treatment modality in the management of colonic injuries as compared to colostomy, provided that there is early presentation, younger age of the patient, minimal faecal contamination with stable hemodynamics.

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