

Role of Barium Enema Preceding Colostomy Closure in Trauma Patients is Limited and Challengeable

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The prospective study comprising 50 cases was conducted in West Surgical Ward, Mayo Hospital, Lahore from January 2000 to December 2001. Majority of the patients 45(90%) were male and 5(10%) patients were female. Cause of colostomy in 28(56%) patients was firearm, stab injury in 13(26%), blunt trauma in 4(8%), rectal impalement in 3(6%) and iatrogenic injuries in 2(4%) patients. Barium enema preceding colostomy closure was advised in all patients with 98%(49 patients) negative results and 2%(1 patient) false positive results which were found negative on further evaluation by proctoscopy/sigmoidoscopy. Gut was prepared pre-operatively by both chemical and mechanical methods. Colostomy closure was performed in 43(86%) and resection and end to end anastomosis in 7(14%) patients. Skin was left open in all cases. Post-operative complications observed in the series were interloop abscesses in 1(2%), anastomosis narrowing in 1(2%) and urinary tract infection in 1(2%) patient. All complications were managed according to their own protocol and priority. No mortality was recorded in the study.

Key words: Trauma, Colostomy, Barium enema/distal loopogram, Colostomy closure/reversal.

Colon injury is still widely recognized as one of the most serious intra-abdominal injuries in civilian practice because of the lethal consequences of peritoneal contamination¹. The dramatic improvement in survival brought about by exteriorization of the injury as colostomy during the 1939-1945 war is well known and has led to strong support for its extensive use in civilian practice², in the belief that disruption of a suture line plays a major role in both morbidity and mortality. Causes of injury, reduction of injury to operation time, aggressive resuscitation and early administration of antibiotics have contributed to improve survival irrespective of how the colon injury is managed.

Colostomy closure is an essential of trauma care. Three aspects of colostomy closure deserve discussion which include

- Attendant morbidity
- Use of pre-closure contrast studies
- Time of closure.

The reported morbidity of colostomy closure in trauma patients varies from 5-27%³ and mortality less than 1%⁴. Numerous diagnostic and therapeutic practices are used in an attempt to reduce the morbidity of colostomy closure especially barium enema.

Though barium enema is a safe and accurate diagnostic study of colon where indicated with radiation dose equal to 350 chest radiographs⁵ but in rare cases complications may occur which include barium peritonitis⁶, extra-peritoneal rectal perforation⁷, bowel perforation in 0.02-0.04% cases, sub-mucosal barium granuloma, venous intravasation of barium, bacteremia, barium impaction, water intoxication, allergic reactions and cardiac arrhythmias⁸. Recently the routine use of barium enema preceding colostomy closure in trauma patients has been challenged^{9,10} because it often adds un-

necessary delay, expense and risk of complications and in no case, will change the operative management.

The timing of colostomy closure is best based on the extent of post-injury abdominal sepsis, severity of colonic and extra-colonic injuries and general condition of the patient including nutritional status. Optimal timing varies from patient to patient but can be performed safely for most of the patients in between 2-3 months after injury³.

Aims and Objectives

The principal aim and objective of this study was to evaluate the role of pre-operative barium enema in colostomy reversal keeping in view of its undue hospital burden, cost and hazards in young trauma patients.

Material and Methods

The prospective study was conducted in West Surgical Ward, Mayo Hospital, Lahore for a period of two years from January 2000 to December 2001. All the patients in whom exteriorization of injured colon or covering loop colostomy with distal colon repair at the time of initial injury managed in the ward and referred cases were included in the study which had 50 patients. Barium enema was advised in all patients along with proctoscopy/sigmoidoscopy in false positive cases pre-operatively. All patients were admitted through Out Patient Department after 12 weeks of their colostomy duration. Gut was prepared by both chemical as well as mechanical method. Three doses of erythromycin and metronidazole per oral was given to all patients. Colostomy reversal and resection and end to end anastomosis were performed in two layers. Skin was left open in all cases. All the patients were kept nil by mouth for 72 hours without nasogastric tube. Antibiotics and analgesics were given to all patients. Hospital stay ranged from 6-20 days with the mean of 10.42 days.

Results

The prospective study consisting of 50 cases who were admitted in the ward for colostomy reversal in whom colon injuries were managed initially in the form of exteriorization or defunctioning loop colostomy after distal colon injury repair. All patients were above 12 years of age. In the study 45(90%) patients were male and 5(10%) were female. Majority of the patients 37(74%) were in between the age of 17-30 years as in table 1.

Table 1: Age/sex distribution

Age in year	n=50	%age
13-20	12	24
21-30	25	50
31-40	10	20
>49	3	6
Sex		
Male	45	90
Female	05	10

Age ranged from 17-67 years with the mean of 26.82 years.

Regarding cause of colostomy, firearm in 28(56%) and stab injury was in 13(26%) patients as in table 2.

Table 2: Causes of (injury) colostomy

Cause/mechanism of injury	n=50	%age
Firearm injury	28	56
Stab injury	13	26
Blunt trauma	4	8
Rectal impalement	3	6
Iatrogenic:		
Appendicectomy	1	2
Caesarian section	1	2

Regarding site of injury, sigmoid colon in 23(46%) patients was the most common injured part of the colon in the series as in table 3. Exteriorization was done in 37(74%) and covering loop colostomy in 13(26%) patients.

Table 3: Site of the colon injured

Injured site	n=50	%age
Sigmoid colon	23	46
Transverse colon	17	34
Splenic flexure	3	6
Descending colon	2	4
Rectum:		
Intra-peritoneal	4	8
Extra-peritoneal	1	2

Barium enema preceding colostomy closure was advised in all patients which showed 98%(49 patients) negative results and 2%(1 patient) false positive results. Further evaluation with the help of proctoscopy and

sigmoidoscopy had no positive findings in false positive category.

Colostomy closure was performed in 43(86%) and resection and end to end anastomosis in 7(14%) patients. All the patients were observed keenly for post-operative complications if any and their prompt management as in table 4.

Table 4: Post-operative complications with management

Complication	n=50	Management
Respiratory tract infection	3	Conservative
Interloop abscesses	1	Conservative
Anastomosis narrowing	1	Re-exploration
Urinary tract infection	1	Conservative

No mortality was observed in the series.

Discussion

Colostomy closure is a major abdominal procedure with definitive morbidity. Numerous diagnostic and therapeutic practices are used in an attempt to reduce the morbidity of colostomy reversal. Pre-operative barium enema/distal loopogram is often performed but rarely useful in trauma patients especially in young group. Moreover this investigation merely increased hospital cost, undue delay of hospital stay, cost effective for the patients and its complications, without a corresponding decline in morbidity in such patients.

The most common population at risk for trauma is in their reproductive age. In the study of 50 patients, 37 were in between the age of 17-30 years and age range was from 17-67 years with mean of 26.82 that compares with the study conducted by Sola JE, et al³ where age range was from 16-74 years with the mean of 28.1 years in their series of 86 patients.

Due to limited and challenging role of barium enema in trauma patients, it has been argued that the nature of injury should be apparent from initial laparotomy and that the likely hood of finding an unsuspected colonic lesion in the young, previously healthy individuals who constitute the majority of trauma patients is very small. In the series all patients having colostomy due to trauma were advised pre-operative barium enema for evaluation showing 98% negative results and only 2% false positive results which were also found negative with proctoscopy/sigmoidoscopy. This resembles with the studies conducted by Modiba TE, et al¹¹ where the results of cologram were 100% negative in their 69 patients and Sola JE, et al¹⁰ where 98% results of pre-operative barium enema were negative in their 43 (group I) patients and 2% positive findings and those did not affect the planned surgical procedure.

Colostomy reversal is a major surgical procedure associated with significant morbidity. In the study an overall morbidity was 12% which compares with the study

conducted by Sola JE, et al³ where a total morbidity was 24.4%.

There was no mortality in the series that resembles with the study conducted by Pittman DM, et al¹² in which no death was recorded in their 126 patients.

Barium enema/distal loopogram fails to uncover unsuspected patient diagnosis, often adds unnecessary delay and expense and in no case changes the operative management in trauma patients with colon injuries. Moreover it is invasive and yields little useful information and does not affect morbidity, rather it increases morbidity due to its own complications. In the light of all these, routine use of this investigation in young trauma patients should be abandoned after further evaluation. Barium enema prior to colostomy closure may be useful in defining anatomy when there is injury to associated structures like bone, urinary bladder and vagina at the time of initial injury.

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