

Primary Repair Vs Colostomy In Colonic Injuries – A Two Year Experience At Lahore General Hospital And Mayo Hospital, Lahore

A U HAQ F MUMTAZ M Z WAHLA

Department of surgery Lahore General Hospital and Mayo Hospital Lahore
Correspondence to Dr. Anwar ul Haq, Associate Professor of Surgery.

The object of the study was to compare the results of primary repair in colonic injury with colostomy. 200 patients were selected, 100 being allocated to each group. All patients underwent laprotomy mostly indicated by peritoneal irritation. Most of the injuries were of the transverse colon. 22 patients underwent exteriorization of the repaired part. Right hemicolectomy and ileocolic anastomosis was done in 30 patients. A significant morbidity occurred from wound sepsis, abdominal abscess formation and postoperative pulmonary complications. 22 patients suffered from burst abdomen and 10 developed faecal fistulas. 4 patients died. Prolonged mean hospital stay and more incidences of postoperative complications occurred in colostomy group. This shows that primary repair of colonic injuries should be done in selected cases instead of colostomy in each case.

Key words: Colonic injury, primary repair, colostomy

Injuries to the colon continue to be a vexing problem for the trauma surgeon¹. The ubiquitous placement of the colon in all quadrants of the abdomen places it at risk in almost all patients with abdominal injury. The microbiological flora of the colon make colon injuries the most common cause of sepsis in the abdomen after penetrating wounds. No area within the field of surgery is static. This holds particularly true for the managements of the colonic injuries. It is undergoing revolutionary treatment like repair with exteriorization and one stage primary repair of colonic injuries is replacing covering colostomy. This has been largely due to increasingly clear understanding of healing process in the colon and early presentation of the patients to the hospitals for treatment. Availability of modern diagnostic CT scanning has helped a lot². These all factors have decreased the time interval between injury and surgery, probably the most important deciding factor regarding the management of colonic injuries. In this study the results have been analyzed and conclusions have been presented to point out the areas where improvements can be made to reduce the morbidity and mortality in cases of injuries to the colon.

Patients and method:

A prospective study was carried out over a period of two years from September 2003 to September 2005 at Lahore General Hospital and Mayo Hospital Lahore. During this period all colonic injury patients admitted in surgical wards were considered eligible for this study. Patients were picked up randomly. The management protocol remained unchanged. Preoperative investigations were performed on all cases except where signs of major vascular bleed demanded immediate exception.

Inclusion criteria were history of abdominal trauma either penetration or blunt, history of thoracic trauma with signs of peritoneal irritation, history of haematuria and bleeding per rectum after trauma, evisceration after trauma, history of penetrating buttock trauma with signs of peritoneal irritation, positive diagnostic peritoneal lavage.

Exclusion criteria were children above age of 12 years, superficial abdominal wound managed conservatively, patients died before surgery, associated head injuries and patients in which no colonic injuries identified on exploration. For study purpose the management of patients was divided into following phases:

Phase: 1 preoperative resuscitation, and investigations.

Phase: 2 operative procedures

Phase: 3 postoperative care in the ward

Phase: 4 post operative follow-up at out patient department after discharge from the ward

Phase: 5 only for those patients who were readmitted for colostomy closure

Phase: 1 categorization of patients and appropriate management. Upon arrival in emergency department, a brief history and examination was done for initial assessment to define the extent and severity of injury. Two large bore intravenous catheters were inserted and blood was drawn and sent for grouping and cross matching. Balanced salt solutions were started and monitoring was done specially in patients with previous history of cardiac and renal diseases. Blood complete, blood urea, blood sugar, electrolytes, blood sugar (random) were sent to the laboratory. X- ray chest and abdomen both erect and supine were obtained. ECG was done if the patient was of above 40 or previous history of cardiac and renal disease. Indications of laprotomy were evisceration of viscera, patients with fire arm injury to the abdomen, an x-ray evidence of internal abdominal visceral injury, stab wound with signs of peritonism, positive diagnostic peritoneal lavage, profuse and continuous bleeding from the wound, wounds of lower thorax with signs of peritoneal irritation, in stab victim where exploration of the wound under local anesthesia showed peritoneal penetration. Broad spectrum anti biotics were given. A combination of Ampicilline, gentacin and metronidazole were used except in patients allergic to any of these. In renal patients Cephalosporins and metronidazole were administered. Antibiotics were continued post operatively till these were required or

patients showed untoward effects, or culture and sensitivity results forced them to change.

Phase: 2 Every effort was made to shift the patients to the operation theatre as early as possible. The choice of a particular procedure was made by on duty Senior Registrar. Colonic injuries and associated injuries were evaluated and graded for the extent of tissue damage and degree of faecal contamination. The colonic injuries fulfilling the following criteria were managed by primary repair i.e. debridement and two layer closure and if necessary resection and anastomosis in two layers and the inclusion criteria was (a) if the operation was done within 8 hours of injury (b) not more than 4 pints of blood were required to stabilize the patient (c) if the systolic blood pressure was never less than 80 mm of Hg at any stage of management (d) faecal contamination was either was either minor or moderate (e) There were not two or more than two intraabdominal organ injuries. Renal and pancreatic injuries were exception. When colonic injury was associated with either of these organs primary repair was not attempted. (f) When colonic injury was not associated with systemic disease like jaundice, chronic renal failure, or cardiac disease. (g) When the injury was not situated on the mesenteric border. (h) Colonic injury due to blunt trauma or firearm not included in this group. (I) Patients age was less than 50 years (j) There was no injury to the mesentery or major blood vessel of the colon. (k) Multiple injuries to the colon were not included in this group. All these injuries, which did not fulfill these criteria, were treated with alternative methods of management. The primary repair and resection anastomosis was done in two layers (inner layer of running 3/0 vicryl and outer layer of 3/0 vicryl interrupted lamberts sutures. In five patients (2.5%), the injuries of caecum and ascending colon were of such a nature that right haemicolectomy and ileocolic anastomosis was done. Four cases were selected for primary and exteriorization of repaired part out of abdominal cavity for early drop back, when there was evidence of healing in repaired part. It was done on antimesenteric border injuries amenable to suture closure rather than resection and capable of mobilization to the abdominal wall with out excessive tension. In rest of the patients, the colonic injuries were managed by exteriorizing the injured part in two layers by vicryl 3/0 followed by construction of proximal colostomy. In some cases proximal end was brought out as end colostomy and distal was either brought out as mucus fistula or dropped back after closing in two layers (Hartman's procedure)

Phase: 3 It consist of postoperative care of the patients till their discharge. It includes drip and suction, monitoring of bowel functions, fluid and electrolytes and administration of antibiotics. The care of stoma and its complication was next to note. In case of exteriorization, meticulously postoperative care was done in the form of moist dressing change. The exteriorized part was dropped back into the peritoneal cavity after the evidence of proper healing

usually on the 5-8th postoperative day. Facial defect was repaired and wound left open for secondary healing. In case, in which there was evidence of anastomotic breakdown, exteriorized portion was converted either into colostomy or proximal part was anchored as end colostomy and distal part was put back into abdominal cavity after closing in two layers. Intraperitoneal abscess were managed by aspiration under ultrasound control. Open drainage was done for resistant cases. Faecal fistulae were managed conservatively by using parenteral nutritional therapy and electrolyte supplement. Patients were discharged from the ward when they became afebrile and wound had healed or had nicely been granulated for healing by secondary intention and colostomies were adequately functioning.

Phase: 4: It consist of follow-up of the patient in out patient department fortnightly for first two months and monthly for the next four months. Barium enema was done after three months of repair, in those patients who attend outpatient department at that time.

Phase: 5: It was only for those patients, who had colostomy as part of their colon injury management. Patients were admitted after 12 weeks of operation, for closure of colostomies. In these patients the gut was prepared with antibiotics and mechanical wash out.

Group A: Primary repair and resection anastomosis Group B: Colostomy group, Group C: Repair with exteriorization of repaired part Group D: Right hemicolectomy and others.

Results:

From September 2003 to September 2005, 200 patients with injuries to the colon at random coming to the emergency and casualty department of Lahore General Hospital and Mayo Hospital Lahore were included in this study. There were 150(75%) male and 50 (25%) female patients. The mean hospital stay was 29 days ranging from 6 to 52 days. 126(63%) patients were wounded by fire arm injuries, 42(21%) were victim of stab wound, 28(14%) patients received blunt trauma abdomen and 4(2%) were of victim of air compression injury with air nozzle at the anal opening. 102(51%) patients were brought with a distance of 20 kilometers from hospital. The mean interval between injury and reporting to the hospital was 4.7 hours. At the time of initial examination mean pulse rate was 95/min and average systolic blood pressure was 106 mm Hg. 46(23%) patients were obviously pale. Free gas under the diaphragm was observed in 62(31%) patients, guarding was present in 92(46%) patients. All patients were explored by midline incision. Haemoperitonium was uniform finding. Faecal contamination was minimum in 66 (33%) patients, moderate in 110(55%) patients and major in 24(12%) patients. Overall mortality was 4.

Discussion:

Management of colon injuries is one of the most of lively debates of the modern surgery. With improve management

of shock; pre-operative care and the use of antibiotics, the risk of anastomotic breakdown have significantly diminished. High velocity injuries are less common in civilian practice than battlefield further reducing the likelihood of extensive soft tissue damage and risks for anastomotic break down³. Recently reported overall mortality in civilian practice for colonic injuries treated with primary repair has fallen to less than 5%. The incidence of septic complication following colonic injury has been reported to be from 15% to 60%. It was 17% in our study and most of them were of wound infection and intraabdominal abscess formation. These complications were high in colostomy group (10%vs7%). The infective complication could have been further reduced by the use of costly antibiotics, better operative facility and availability of senior surgeons in the emergency⁴. Because most of the operations in the emergency were performed by the resident staff which significantly prolonged the operation time. It is now an established fact that the longer the longer wound exposure is definitely associated with higher rate of postoperative infection.

All the patients who sustained colon injuries after blunt abdominal trauma were included in the colostomy group. In our set up where patients come usually late and there are no modern diagnostic facilities for pre-operative diagnosis, perhaps primary repair is still risk and these patients should be treated by construction of colostomy. Although there are high apprehensions regarding colostomies but still it is safe, acceptable and conservative method of treating colonic injuries. Although there is a string moves towards primary repair, there is still some clinical situation in which colostomy is the most suitable choice for the patients. Despite recent evidences indicating that associated risk factors play a more important role than the type of repair; colostomy is still used extensively in many centers including our own institution. Depending upon the part injured, the bowel may be exteriorized as loop colostomy or closed and proximal site is chosen for splenic flex or should be avoided as subsequent is difficult. All the colostomies were opened up at the time of operation. There is much debate about regarding psychological trauma associated with construction of colostomy but the management of colostomy is now easier than into the past because of improved colostomy devices. Concern about treating the patient with a colostomy, centers around the extra morbidity and extra hospitalization associated with its use. Our study also favours this finding because complication rate associated with colostomy closure was about 17% and there was significantly longer hospital stay. Exteriorized repair which consist of repairing the colon injury with and with out resection and anastomosis and exteriorizing the repaired segment on the abdominal wall. Meticulous attention to technical detail is necessary if the bowel can be expected to heal. So the initial appeal of this procedure i.e. to avoid colostomy in those patients did not lend

themselves to a primary repair seems to have gone. In spite of an initial burst enthuse for this procedure, most surgeons have abandoned use. Our study also favours their opinion and this procedure should be considered an absolute. In Group where right hemicolectomy followed by iliocolic anastomosis was done shown the best result of the study. The complication rate and hospital stay was the lowest. But some surgeons believe that anastomosis of the ileum to the colon should not be done in the presence of associated injuries as this is associated with the increased incidences of anastomotic leak, abscess formation and peritonitis. In our study primary repair group showed more favourable results than patients of group colostomy were performed. Primary repair of selected colon injuries is becoming more popular. More and more series are now advocating its adaptation although there still remains a lack of consensus regarding selection criteria.

Recognizing the effects of the risk factors and apparent lack of concern for minor and moderate injuries on the left, most authors now report primary repair in approximately 50-60% of their patients⁶. But majority of the articles reported in the literature are of retrospective studies that, in general have to control are subjected to clinical judgment of several physicians. A bias that favours colostomy for more serious patients and primary repair for the more favourable lesion can not be excluded from these reports. Our own study has shown more favourable results in primary repair of colon than colostomy. The mortality, total hospital stay, infection rate, and use of antibiotics were much less in primary repair groups than in colostomy groups. So primary repair should be our preferred treatment in carefully selected patients of colonic injuries. But a word of caution remains to be mentioned. Injury severity indices become more refined, they may help to ensure reliable data collection until such times as the safety or primary repair is conclusively proven. Those patients chosen for its use should be carefully selected⁷. More favourable results in primary repair may be due to fact that patients chosen in this group were carefully selected and nature of their injury was relatively less serious than patients of colostomy group. The morbidity and mortality of patients with colon trauma may relate to risk factors like shock, faecal contamination, age, extent of injury and number and type of associated injuries rather than the type of repair. Whatso ever decision made should be in the best of the patient than liking and disliking of the surgeon. The results can be different in any method of treatment if meticulous surgical techniques are applied⁸.

So the conclusion is that the evaluation and management of colon injuries have recently under gone significant changes. The role of colostomy has been challenged by the need for additional operative procedure, patient's disability and raising hospital and medical costs, but role of colostomy should not be abandoned only because of its complications.

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