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# Safety of Primary Repair and Resection Anastomosis In Small and Large Bowel Injuries in Patients With Abdominal Trauma

Shahida Parveen Afridi,[1*] Akram Rajput,[1] Fraz Azmat[1]

*ABSTRACT*

*Objective* — *To find out the safety of primary repair and resection anastomosis in small and large bowel injuries following abdominal trauma.*

*Study design* — *Descriptive case series.*

*Place & Duration of study* — *Department of General Surgery Dow University of Health Sciences & Civil Hospital Karachi, from 2011 to 2014.*

*Methodology* — *Patients diagnosed with small and large bowel injury who presented in emergency department within 8 hours of accident, were included. All patients were managed according to Advanced Trauma Life Support (ATLS) protocol. Single perforation was repaired primarily with freshening of the margins. Multiple perforations close to each other were managed with segmental resection and anastomosis. Perforations away from each other were managed with both primary repair and resection anastomosis. All repair and anastomosis were done in two-layers.*

*Results* — *Fifty patients were included in this study. There were 43 (86%) males and 7 (14%) female patients. Mean age of the patients was 29+9.44 year. Most of patients presented with fire arm injury (n=43 - 86%), followed by stab wound (n=5 - 10%) and blunt trauma (n=2 - 4%). Small bowel injury was found in 17(34%), large bowel 13 (26%) and both small and large bowel injuries in 20 (40%) patients. Primary repair was performed in 28 (56%), while resection anastomosis in 17(34%) and both primary repair and resection anastomosis in 5 (10%) patients. Complications observed included wound infection (n=10 - 20%), wound dehiscence (n=8 - 16%), burst abdomen (n=2 - 4%), anastomotic leakage (n=1 - 2%). One (2%) patient died in this series.*

*Conclusion* — *Primary repair and resection anastomosis without diversion was found safe in the treatment of small and large bowel injuries due to trauma.*

*Key words* — *Primary Repair, Resection anastomosis, Abdominal trauma, Gastro intestinal trauma.*

**INTRODUCTION:**

Abdominal trauma management depends upon the hemodynamic stability of the patients. In unstable patients with abdominal trauma there may be ongoing intra abdominal hemorrhage leading to shock and peritonitis. These patients need emergency exploratory laparotomy and damaged control surgery in an unstable patients which may include initial control of hemorrhage leading to shock, resuscitation to restore normal physiology and closure of abdomen with definitive laparotomy later on. However in stable patients investigations are performed to evaluate for abdominal injuries. Majority of patients with penetrating injuries are best managed by exploratory laparotomy. The presence of colonic injury and the

[1] Department of Surgery DUHS, DIMC Ojha Campus Karachi.

Correspondence:
Dr. Shahida Parveen Afridi [1*]
Department of Surgery
Dow University of Health Sciences
DIMC OJHA Campus
Karachi
E mail: surgeonshahida@gmail.com

number of organs injured more than three are important predictors of morbidity and mortality in penetrating high velocity missiles and fire arm injuries. The aim of this study was to find out the safety of primary repair and resection anastomosis in small and large bowel injuries in patients with abdominal trauma.

**METHODOLOGY:**

This was a descriptive case series conducted in one of the surgical units of the Department of General Surgery, Dow University of Health Sciences & Civil Hospital Karachi, from 2011 to 2014. Abdominal trauma patients diagnosed with small and large bowel injury who presented in emergency department within 8-hours of injury and vitally stable, were included in this study. Patients who presented later than 8-hours, those with comorbid, small bowel and large bowel injuries associated with more than one visceral injury, poly trauma and hemodynamically unstable patients, were excluded.

All patients were managed in ER according to ATLS protocol and resuscitated. Routine blood investigations were sent and blood was arranged. Radiological investigations and FAST were also performed. All the patients were subjected to exploratory laparotomy. Surgical procedure was selected according to the type and site of injury. Single perforation was repaired primarily with freshening of the margins while multiple perforations, close to each other, were managed with segmental resection anastomosis. If perforations were away from each other then both primary repair and resection were done. Postoperatively all patients were managed in the high dependency unit (HDU). Complications were also recorded. Data was collected on a predesigned form. Statistical package for social sciences (SPSS) version 18.0 was used to analyze the data. The mean + standard deviation, median and range were calculated for numerical variable while frequency and percentages were computed for categorical variable.

**RESULTS:**

Total number of patients included in this study was fifty. Mean age of the patients was 29.44+ year with range of 41 (55-14). There were 43 (86%) male and 7 (14%) female patients. Fire arm injury was the most common cause reported in 43 (86%) patients.

Time interval to ER after accident was four hours in 92% patients. Most (n=33 - 66 %) of the patients had multiple injuries (table I). Small bowel was injured in 17 (34%) patients (table II). primary repair of the perforation was performed in 28 (56%) patients. Postoperative complications observed included wound infection in 10 (20%) and wound dehiscence in 8 (16%) patients (table III). Mortality was 2%.

**Table I: Pattern of Injuries (n=50)**

| Variable | Number (n) | % |
|---|---|---|
| **Type of trauma** | | |
| Fire arm injury | 43 | 86 |
| Stab wound | 5 | 10 |
| Blunt trauma | 2 | 04 |
| **Time interval between injury and presentation** | | |
| Within 4 hours | 46 | 92 |
| Between 4-8 hours | 04 | 08 |
| **Wound of entry in abdomen** | | |
| Epigastrium | 1 | 2 |
| Right sub costal region | 5 | 10 |
| Left subcostal region | 6 | 12 |
| Right and left subcostal region | 3 | 6 |
| Central abdomen | 9 | 18 |
| Right lumbar | 1 | 2 |
| Left lumbar | 2 | 4 |
| Right iliac | 3 | 6 |
| Left iliac | 6 | 12 |
| Suprapubic | 2 | 4 |
| Multiple | 6 | 12 |
| Back | 4 | 8 |
| Blunt trauma | 2 | 4 |
| **Number of Injuries** | | |
| Single | 17 | 34 |
| Multiple | 33 | 66 |

**DISCUSSION:**

Gastrointestinal injuries are commonly seen in abdominal trauma, and it was suggested by different trauma guidelines that GI surgeon must be a member of initial emergency team. Positive predictive value of physical examination has a very important role in penetrating abdominal injury, but not confirmative., FAST is very good, noninvasive strong predictor of intra abdominal injury. Antibiotics coverage to both gram positive and negative anaerobes have a prophylactic value, and is given to all the patients before surgery. Diagnostic peritoneal lavage also has a role in trauma.

CT has become the best modality for evaluating the stable trauma patients for the presence of intra-abdominal injury. Diagnostic and therapeutic

**Table II: Bowel Injuries (n=50)**

| Variable | Number (n) | % |
|---|---|---|
| **Bowel affected** | | |
| Small bowel | 17 | 34 |
| Large bowel | 13 | 26 |
| Small & large bowel | 20 | 40 |
| **Part of small bowel** | | |
| Duodenum | 01 | 02 |
| Jejunum | 17 | 34 |
| Ileum | 12 | 24 |
| Jejunum plus Ileum | 07 | 14 |
| **Part of Large bowel** | | |
| **Part of Large bowel** | 01 | 2 |
| Caecum | 04 | 8 |
| Ascending colon | 16 | 32 |
| Transverse colon | 01 | 2 |
| Descending colon | 08 | 16 |
| Sigmoid colon | 05 | 10 |
| Rectum | 04 | 8 |
| Ascending colon and transverse colon | 01 | 2 |
| Caecum and ascending colon | 03 | 6 |

**Table III: Surgical Procedure and Outcome**

| Variable | Number (n) | % |
|---|---|---|
| **Surgical procedure** | | |
| Primary repair | 28 | 56 |
| Resection anastomosis | 17 | 34 |
| Primary repair & resection anastomosis | 05 | 10 |
| **Ward stay** | | |
| 1 week | 4 | 08 |
| 2 week | 21 | 42 |
| 3 week | 16 | 32 |
| 4 week | 9 | 18 |
| **Postoperative complications** | | |
| Wound infection | 10 | 20 |
| Wound dehiscence | 8 | 16 |
| Burst abdomen | 2 | 4 |
| Anastomotic leakage | 1 | 2 |
| None | 29 | 58 |
| **Final Outcome** | | |
| **Expired** | 1 | 2 |

laparoscopy also has an important role in trauma patients to avoid an unnecessary laparotomy. Peritoneal breach is an indication for exploratory laparotomy. Massive hemorrhage is a big problem in penetrating abdominal trauma, controlled initially by pressure and packing and later on definitive control depending upon the cause.

Independent predictors for gunshot induced colonic injury depends upon the degree of peritoneal contamination and site of injury.[16] Colonic injury can be successfully managed by primary repair and anastomosis.[17,18] Laparoscopic repair of small bowel injury also has a role.[19] Morbidity and mortality depend upon the peritoneal contamination, late presentation, sepsis and shock. The mortality was 2% in our study while another study showed 3% mortality.[20] Stable patients can be evaluated with chest x ray, ultrasound abdomen, CT chest and abdomen and can be managed conservatively under observation to avoid the laparotomy.[3]

## CONCLUSIONS:

Primary repair and resection anastomosis was found safe in bowel injuries due to abdominal trauma in patients who presented early with stable vital signs.

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