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(CLINICAL PRACTICE ARTICLE)

SMALL BOWEL INJURIES; FREQUENCY AND PATTERN IN ABDOMINAL TRAUMA



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ABSTRACT ... drmuzaffaraziz@yahoo.com **Objectives:** To describe the frequency and pattern of small bowel injuries in blunt and penetrating abdominal trauma. **Design:** A descriptive study. **Setting:** Nishtar Hospital Multan **Period:** From January 2002 to September 2003. **Material & Methods:** 100 patients presenting with abdominal trauma were included in the study. After receiving patient in emergency ward, proper resuscitation measures were made according to ATLS guidelines. After that proper history was taken and appropriate investigations were carried out and separate file was maintained for each patient. All patients with blunt and penetrating abdominal trauma were included in the study. The final decision was made on laparotomy. Only those patients having small bowel injuries were included in the study, rest were excluded. **Results:** In this study 33 patients were presented with blunt abdominal trauma. 6 (18%) patients had duodenal injuries, 11(33%) had jejunal injuries, 16(48%) had ileal injuries and 7(21%) had mesenteric injuries. 67 cases presented with penetrating trauma. 42 (62%) were due to firearm and 25(38%) were due to stab wound, duodenal injuries were in 12 cases (16%), ileum 32(47%), jejunum 24(35%) and mesenteric injuries in 18 cases (26%).

Keywords: Blunt abdominal trauma, Penetrating trauma, Firearm injury, Laparotomy, Small bowel injury.

INTRODUCTION

Trauma is defined as damage to the body by exchange with environmental energy that is beyond body's resilience¹. It is the most common cause of death and disability in age of 1-50 years². Abdomen is among the

commonly injured region of the body because it has more surface area. It is bounded above by last 4-5 ribs and below extends into pelvis.

Blunt abdominal trauma is due to motor vehicle accident,

seat belt injuries, sport-related injuries and falls. There are two basic mechanisms of injury that is compression forces and deceleration forces³.

Penetrating trauma may be due to firearm, knives, glass piece and wood material. 80% of penetrating injuries are due to firearm and 20% are due to stab wounds⁴. Incidence of gunshot wounds especially with high velocity bullets has raised up to 90-95% as compared to stab wounds (40%)⁴. Penetrating injuries require more surgical intervention than blunt trauma.

Abdominal injuries include hollow viscera and solid organ injuries. Small bowel injuries are common due to large surface area and its variable position. These can be injured alone or associated with other injuries like liver, spleen, stomach, large gut, mesentery, kidney and pancreas. Small bowel injuries can be single or multiple. Most commonly injured portion of gut is jejunum (>38%) followed by ileum (24%) and duodenum (23%)⁵.

MATERIAL & METHODS

It was a descriptive study of 100 patients presented in Nishtar Hospital Multan with both blunt and penetrating abdominal trauma from January 2002 to September 2003. All patients with abdominal trauma having suspicion of small bowel injuries were included in study. Patients below age of 12 years, patients in which on wound exploration peritoneum was intact, patients in which small bowel was normal and the patients managed conservatively were excluded from study.

A separate file was maintained for each patient. A thorough history and full physical examination was conducted, relevant investigations were carried out after proper resuscitation measures according to ATLS guidelines. The patients were divided into two groups. One with penetrating abdominal trauma and other of blunt abdominal trauma. The definite procedure (laparotomy) was performed. Frequency and pattern (extent and site) of small bowel injuries in both blunt and penetrating abdominal trauma were studied. All this was recorded in data collection form and data analysis (percentage and ratios) was done on SPSS window.

RESULTS

Sixty eight patients (68%) were male and 32 patients (32%) were female. Male to female ratio was about 2.1:1. 9% cases were between 12-30 years showing the peak incidence, 30% patients belonged to 30-50 years and 21% cases were more than 50 years old.

Fifteen patients (15%) presented within one hour of the incident, 52 patients (52%) presented between 1-6 hours, 29 patients (29%) came to the hospital within 6-12 hours and remaining four patients (4%) came to the hospital within 12-24 hours.

Thirty three patients (33%) were of blunt abdominal trauma and 67 patients (67%) were having penetrating abdominal trauma. In 67 cases of penetrating trauma, 42(62%) were due to firearm and 25(38%) were due to stab wound. The firearm 18(42%) cases were of shotgun and 24 patients (58%) received gunshot injuries.

Mechanism of blunt trauma was due to roadside accident in 21 cases (63%) fall in 4(12%), fight 3(9%), impact 2(6%) and animal hit in 3(9%). Six(18%) patients had duodenal injuries, 11(33%) had jejunal injuries, 16(48%) had ileal injuries and 7(21%) had mesenteric injuries (Table I).

Site	No of cases	%age
Duodenum	6	18%
Jejunum	11	33%
Ileum	16	48%
Mesentery	4	12%
Multiple injuries of small bowel	4	12%

Nine cases had only small bowel injuries. Twenty-six cases had small bowel injuries associated with other organs. Associated injuries were liver (33%), spleen (15%), colon(6%), head injury(9%), fracture long bone (9%), chest injury (9%) and pelvis (4%).

Site	No of cases	%age
Duodenum	11	16%
Jejunum	24	35%
Ileum	32	47%
Mesentery	18	26%
Multiple injuries of small bowel	19	28%

Among 67 patients who received penetrating trauma, 8 patients (23%) had multiple injuries of different organs in addition to small bowel. duodenum was injured in 12 (16%), ileum in 32(47%), jejunum in 24 (35%) patients while mesenteric injuries were present in 18(26%) patients(Table II).

Nineteen patients (28%) had only small bowel injuries. Forty-eight (71%) patients had associated injuries of different organs in addition to small bowel.

Stomach was involved in 4(6%), liver in 13(19%), spleen 6(8%), chest 10(14%), colon 6(8%), fracture long bones 1(2%), bladder 3(4%) and kidney 4(8%) patients. About 12(17%) patients had multiple organ injuries.

Regarding the extent, simple laceration of small bowel

was present in 15(15%) cases, single gut perforation was present in 21 cases (21%), multiple perforations were present in 13(13%), total transection was present in 9 cases (9%), mesentery tear was present in 25 cases (25%) (Table III).

In duodenal injuries 4 cases (23%) were of simple laceration. Eight cases (47%) were of limited perforation and 5 cases (30%) were with extensive laceration.

DISCUSSION

Male predominance (68%) over females (32%) in present study is due to fact that adult males are more exposed to the outdoor activities. This ratio is comparable to a study in which male to female ratio is about 3:1⁶. Age related data revealed that the most vulnerable age group was of adult between 21-35 (49%), followed by middle age and old peoples. Same sex and age group predominance was seen in a prospective study which was conducted at Liaquat Medical College and Hospital during Jan 1995 to Dec 2000⁷.

In this study, 33 cases were presented with blunt abdominal trauma and 67 cases with penetrating trauma. Out of 67 cases, 42 patients (63%) presented with firearm injury and 25 cases (37%) with stab abdomen.

Type of injury	Jejunum	Ileum	No of pts	%age	Treatment
Simple Laceration	6	9	15	15%	Seromuscular suturing
Perforation single	13	8	21	21%	Primary repair
Perforation multiple	4	9	13	13%	Resection and end to end anastomosis
Transection	6	3	9	9%	End to end anastomosis
Multiple injuries	-	-	25	25%	According to situation
Mesentery tear transverse	6	16	22	22%	Resection and end to end anastomosis
Total	35	48	83	83%	-

Smith R S⁸ published the results of his research showing eighty percent injuries were due to gunshots and 20% were due to stab wounds. There is significant difference between two studies. The reason may be easy availability and modernization of the weapons in the western society.

The mechanism of blunt trauma in present study was due to road side accident in 21 cases (63%), fall in 4(12%), fight 3(9%), impact 2(6%) and animal hit in 3 cases (9%).

A study conducted in Lehigh valley hospital, Allentown, Pennsylvania showed that most common cause of blunt trauma was motor vehicle accident in 79% cases⁶. There is difference between the incidence of roadside accident. This may be because of heavy traffic in the western society but both studies show increased percentage of roadside accident in blunt abdominal trauma.

A study conducted in Mayo Hospital Lahore revealed that commonest etiology of blunt trauma was motor vehicle accident followed by assault, fall from height and animal hit⁹.

In blunt abdominal trauma, 6(18%) patients had duodenal injuries, 11(33%) jejunal injuries, 16(48%) ileal injuries and 7(21%) had mesenteric injuries.

A study showed that most commonly injured portion of bowel was the jejunum (>38%), followed by the ileum (>24%) and duodenum about (23%)⁶. Most injuries were either partial lacerations or contusions. Some patients had complete transaction of small bowel. Almost one-third of mesenteric injuries resulted in a de-vascularized bowel segment and required resection.

In our study, out of 67 cases of penetrating abdominal trauma, duodenal injuries were in 12 cases (16%), ileum 32(47%) jejunum 24(35%) and mesenteric injuries in 18(26%). Incidence of associated injuries with bowel is as; stomach was involved in 4(6%) cases, liver in 13(19%), spleen in 6(8%), chest in 10(14%), colon in 6(8%), fracture long bones in 1(2%), bladder in 3(4%)

and kidney in 4 cases (8%). About 12 cases (17%) had multiple organ injuries.

A study conducted on stab wounds of abdomen in Peshawar showed that 53% cases had hollow viscera involvement and 19% had solid visceral involvement¹⁰. In this study ileum was involved in 21%, duodenum 3%, and jejunum 9%, liver 6%, mesentery 4% and spleen in 2% cases.

A study conducted in Nigeria showed that the commonly injured organs were the small bowel (56.1%) followed by colon (38.6%), liver (22.8%) and stomach (19.3%)¹¹.

Time of presentation to the hospital was one hour in 15 patients (15%), in 1-6 hours in 52(52%), 6-12 hours in 29(29%), 12-24 hours in-patients 4(4%). No case came after 24 hours.

According to study conducted in Peshawar, 60% patients presented within 6 hours of injury, 22% in 6-12 hours, 10% in 12-24 hours and 4% presented after 24 hours¹⁰. Both studies show that mostly patients present in hospital within six hours after injury.

CONCLUSION

Abdominal trauma is common problem in our society. So there should be systematic approach in every case. The present study concludes and suggests

- Commonest cause of abdominal trauma is penetrating one. Most vulnerable are the younger persons.
- Most commonly injured small bowel was ileum followed by jejunum and duodenum in both types of abdominal trauma.
- Patient should be resuscitated properly.
- People should know traffic rules.
- There should be ban on firearms.
- Early diagnoses and treatment can reduce both morbidity and mortality.
- Early decision should be made about plan of treatment either conservative or surgically.
- Special attention should be given in cases of

blunt abdominal trauma. There is increased chance of missed injury. Monitoring of vital signs, abdominal examination and investigations (ultrasound, DPL and CT scan abdomen) helps in diagnosis.

- Associated injuries are common and aid in diagnosis of small bowel and mesenteric injuries.

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**Lost temper;
lost game
lost senses,
lost control**

Shuja Tahir