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Original Research Article

Pattern of Bowel Injury and the Outcome of their Management in Blunt Abdominal Trauma in a Tertiary Care Hospital

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Abstract

Background: Blunt abdominal injury is common in trauma patients. Evaluation of patients who have sustained blunt abdominal trauma may pose a formidable problem and significant intra abdominal injury is one of the most difficult problems faced by emergency doctors and surgeons in the management of trauma. Traumatic bowel injury is one of the curable traumatic conditions. An accurate and timely diagnosis and treatment giving an excellent outcome in most cases. A delay in diagnosis is associated with significant morbidity and mortality. ***Objectives:*** To determine the pattern of bowel injury from blunt abdominal trauma, and outcome of their management of the patient after surgery in a tertiary care hospital. ***Methods:*** It was an observational study carried out in the department of surgery, Shaheed Ziaur Rahman Medical College Hospital, Bogura from April '2020 to September '2020. Thereafter, they were scrutinized according to eligibility criteria and 50 patients were finalized. Patients with a history of bowel injury are managed with blunt abdominal trauma after proper counseling, results were tabulated and analyzed. ***Results:*** A total of 50 patients were enrolled comprising 42(84%) males and 8(16%) females and male-female ration 21:4. Out of 50 patients, most of 18(35%) patients had 31-40 years age group. The mean age was 33.9±7.2 years. Maximum patients reported within 1-6 hours 28(56%) and next group within about 1 hours 11(22%). The average time lapsed was 5.79 hours. 18(36%) patients had concomitant injuries, like 1(2%) patient had a head injury, 8(16%) had pelvic fracture, 4(8%) patients had long bone fracture, 3(6%) patients had soft tissue injury and 2(4%) patients had blunt chest injury. Features of peritonitis were present at initial evaluation 42(84%) patients abdominal pain and features of paralytic ileus 21(42%). 28(56%) cases sustained injury from motor vehicle accident as passenger. Sites of bowel injury were: duodenum 3(6%), jejunum 24(48%), ileum 8(16%), large gut 8(16%), both small and large gut 2(4%). ***Conclusion:*** Traumatic bowel injury is one of the commonest traumatic conditions that are encountered in hospitals, namely in the department of surgery. The management of traumatic bowel injury has a fairly good prognosis in developed countries. The outcome is not as good as expected in the third world countries, like our country, due to certain prevailing adverse conditions. The injury in the small bowel is associated with more morbidity than that in the large bowel injury.

Keywords: Blunt abdominal, intra abdominal, bowel injury, hemodynamically.

INTRODUCTION

Trauma is the medical term refers to the life threatening or serious injuries that require specialized surgical care. The most recent estimates show that injuries are among the leading causes of death and disability in the world. They affect all populations, regardless of age, sex, income, or geographic region [1]. As a "disease" trauma is a major public health problem. In the United States, it is the leading cause of death

among people aged 1-45. For persons under age 30, trauma is responsible for more deaths than all other diseases combined. Because trauma adversely affects a young population, it results in the loss of more working years than all other causes of death [2].

The abdomen is the third most commonly injured body region with injuries requiring operation occurring in about 20% of civilian trauma vactims [3]. Trauma accounts for major losses of the workforce due to the associated morbidity and mortality.

There are many mechanism that account for abdominal injuries. The recognition of two major groups, penetrating and non penetrating is of greatest importance for treatment and has direct implication for the diagnostic work up and therapy [4].

The incidence of small bowel injury secondary to blunt trauma ranges from 5% to 15% and approaches to 50% for all penetrating abdominal injuries.[3] The greatest number of injuries to the colon and rectum are the result of penetrating or perforating trauma. The large bowel is relatively refractory to blunt injury that accounts for only 5% of colonic injuries [5].

Traumatic bowel injury is one of the curable traumatic conditions. An accurate and timely diagnosis and treatment giving an excellent outcome in most of the cases. A delay in diagnosis has been shown to be associated with significant morbidity and mortality. Multiple system injuries, particularly those involving the central nervous system, chest and musculoskeletal abdominal injuries resulting in a delay in the diagnosis and consequently increasing the rate of morbidity and mortality [6].

Whatever the mechanism, early recognition of these lesions can be difficult. An overlooked bowel injury is very dangerous because of its tremendous infectious potential. In this study on traumatic bowel injury have been conducted with special reference to its management and outcome among admitted patients of Shaheed Ziaur Rahman Medical College Hospital, Bogura.

OBJECTIVE

General objective:

- To determine the pattern of bowel injury from blunt abdominal trauma and outcome of their management of patient after surgery in a tertiary care hospital.

Specific objective:

1. To find out site of bowel injuries of the patients in a tertiary care hospital.
2. To find out the pattern of bowel injury after blunt abdominal trauma.
3. To determine the outcome of management for bowel injury following blunt abdominal trauma.

METHODOLOGY

Study Design: It is a quasi-experimental study design.

Study Place: This study was conducted in Department of Surgery of Shaheed Ziaur Rahman Medical College Hospital, Bogura.

Study Population: The study population had all patient with blunt abdominal trauma who had been admitted during the study period in the department of surgery ward of Shaheed Ziaur Rahman Medical College Hospital Bogura.

Study Period: From March 2020 to September 2020

Study Size: Sample size has been of 226.8. Because the time and resource are limited, I took 50 patients.

Sampling Method: Purposive sampling

Inclusion & exclusion criteria

Inclusion Criteria:

- All blunt abdominal trauma patients with bowel injury

Exclusion Criteria:

- Blunt abdominal trauma patients other than bowel injury.
- Blunt abdominal trauma patient with bowel injury who will be referred to specialized center for better management after surgery.

Procedure of preparing and organizing materials

Data have been collected by interview, physical & lab examination, systemic examination, investigation using a structured questionnaire containing all the variables of interest.

Procedure of data Collection

According to the inclusion and exclusion criteria Patients have been enrolled for the study. Patients with blunt abdominal trauma who have been taken as the study population. After explanation informed consent was taken all eligible subjects had evaluated by laboratory test like gastrointestinal injury.

Data Analysis

All the collected data have been compiled and analyzed by statistical package for social science (SPSS-21) software. Numerical date was analyzed by chi-square test, whichever is applicable. The level of significance was $p< 0.05$.

RESULTS

The findings derived from analysis of the collected data are furnished below. Total patients admitted in to the department of Surgery in Shaheed Ziaur Rahman Medial College Hospital, Bogura in the study period from April'2020 to September'2020 were

included in this study. During the study period total bowel injury patients were enrolled.

Table 1: Age distribution of the patients (n=50)

Age in years	Number of patients	Percentage (%)
0-10	1	2.0
11-20	5	10.0
21-30	14	28.0
31-40	17	34.0
41-50	6	12.0
51-60	5	10.0
>60	2	4.0
Total	50	100.0

Above table shows that among age distribution of the patients, in this series ranging from 8-68 years with the incidence in 17(34%) patients age ranging between 31-40 years followed by 14(28%) patients in age ranging between 21-30 years. 1 (2%) patients was below 10 years and 2 (4%) patients over 60 years of age. The mean age was 34±13.4 years.

Table 2: Sex distribution of the patients (n=50)

Sex	Number of patients	Percentage (%)
Male	42	84.0
Female	8	16.0
Total	50	100

Above table shows that out of 50 patients 42 (84%) were male and 8 (16%) female. So male female ratio (M:F= 21:4)

Table 3: Distribution of the patients according to mechanism of injury (n=50)

Cause	Number of patients	Percentage (%)
Motor vehicle accident (passenger)	28	56.0
Pedestrian struck	7	14.0
Assault	5	10.0
Fall from height	2	4.0
Compression	3	6.0
Motor cycle accident	5	10.0
Total	50	100.0

Above table shows that mechanism of injury, out of 50 patients in this series, 28(56%) cases sustained injury from motor vehicle accident as passenger, 7(14%) as pedestrian struck followed by assault 5 (10%). 2 (4%) patients were admitted with injury following fall from height, 3(6%) compression and 5(10%) motor cycle accidents.

Table 4: Distribution of the patients according to clinical presentation (n=50)

Presentation	Number of patients	Percentage (%)
Abdominal pain	42	84.0
Features of paralytic ileus	21	42.0
Retention of urine	6	12.0
Shock	6	12.0
Respiratory distress	5	10.0
Vomiting	4	8.0
Unconsciousness	2	4.0

Most of the patient presented with more than one clinical presentation

Above table shows that clinical presentation, in this study abdominal pain in 42(84%) patients, features of paralytic ileus 21(42%), retention of urine in 6(12%) patients and shock in 6(12%) patients were the commonest mode of presentation.

Table 5: Distribution of the patients according to laparotomy findings of bowel injury following abdominal trauma (n=50)

Organ involved	Number of patients	Percentage (%)
Stomach	**0**	**0.0**
Duodenum	3	6.0
Jejunum	24	48.0
Ilieum	8	16.0
Both jejunum and ileum	5	10.0
Right colon	5	10.0
Left colon	3	6.0
Both small and large bowel	2	4.0
Total 50 patients	50	100.0

Above table shows that in our study of traumatic bowel injury, 80% of patients had only small bowel and 16% sustained large bowel injury and 4% of cases had both small and large bowel injury, 16% of cases had ileum. The commonest site of bowel involvement was jejunum 48% and that of large bowel was right colon 10% and left colon 6%.

Table 6: Distribution of the patients according to associated other intra abdominal visceral injuries (n=50)

Associated injury	Number of patients	Percentage (%)
Liver	8	16.0
Spleen	3	6.0
Kidney	2	4.0
Urinary bladder	3	6.0
Total 16 patients	16	32.0

Above table shows that majority of the cases in this series had isolated bowel injury with no other associated intra abdominal organ involvement while some patients had more than one associated intra abdominal injuries. 16% of patients had liver injury.

Table 7: Overall outcome of patients with traumatic bowel injury in relation to the organ involvement (n=50)

Organ involved	Uneventful recovery	Morbidity	Mortality
Only small bowel (n=40)	14(35.0%)	25(62.5%)	1(2.5%)
Only large bowel (n=8)	5(62.5%)	2(25.0%)	1(12.5%)
Both small and large (n=2)	1 (50%)	1 (50%)	0 (0%)

Above table shows that out of 40 patients of small bowel injury, majority of the patients 25(62.5%) had morbidity and 14(35.0%) had unventful recovery. Out of 8 patients of large bowel injury, majority of the patients 5(62.5%) had uneventful recovery and 2(25.0%) had morbidity. The morbidity was equal patients having both small and large bowel injury.

DISCUSSION

Abdominal trauma can be classified into penetrating and non penetrating trauma [7-9]. A more appropriate term for non penetrating trauma would be blunt or closed abdominal trauma, because some surgeons limit the use of term non penetrating injury to penetrating wounds (restricted to the abdominal injury) in which the peritoneum has not been violated [10-12].

This study comprises 50 patients of blunt abdominal trauma, having bowel injuries, admitted in the department of surgery in SZMCH, Bogura from April to September 2020. So this study is not a complete one and should not be considered as standard findings in Bangladesh. Because very few cases are studied against thousands of abdominal trauma cases. After lapartomy negative bowel injury has been excluded from this study. Intestinal injury has been found in 15-20% of undergoing laparotomy after blunt abdominal trauma [13-15].

The ages of the patients in this study ranges from 8 to 70 years, with the highest incidence 34% in between 31-40 years followed by the age group between 21– 30 years 28%. The mean age was 34±13.4 years. The above figure indicates that the affected people are those who are most mobile and active in their daily life. This is quite similar with the findings in a study by Sarker MM [16,17] and associates where the peak incidence was in the 4th decade of life.

There were 84% male patients and 16% female patients, male:female ratio being 21:4. The higher incidence of trauma to males is due to their predominance both in the working outside the house as well as on the roads as passenger and pedestrians. They are also subjected more to physical assault than the females [16]. The study's sex ratio compares favorable with that of Sarker MM [18] study that documents 87%

male and 13% females out of 100 cases, conforming a male predominance.

In this current study road traffic accident (RTAs) retains the top of the chart as a causative factor of blunt abdominal trauma. Out of 50 patients 56% sustained injury from motor vehicle accidents as passenger, 14% as pedestrian struck followed by assault 10% and fall from height 4%, compression 6%, motor cycle accidents 10%.

Detailed clinical presentation and findings of the cases were studied. The commonest modes of presentation were abdominal pain in 84% patients, features of paralytic ileus 21(42%), retention of urine in 12% patients and shock in 12% patients. Major clinical signs include signs of peritonitis. Like- tenderness in 92% patients, abdominal rigidity in 70% Patients, hypotension in 62% patients, absent bowel sound in 84% patients. pallor in 60.0%, abdominal distension in 30.0%, Obliteration of liver dullness was found in 36% patients and all of them had gut perforation on laparotomy.

In our study of traumatic bowel injury, 80% of patients had small bowel involvement and 16% Sustained large bowel injury and 4% of cases had both small and large bowel injury. The finding is quite similar to that of a study by Rahman MS [19] who also showed that small bowel injury was common in abdominal trauma. The commonest site of small bowel involvement was jejunum 48% and that of large bowel was right colon 10%. This is also consistently with the study by Rahman MS [19]. which also reported jejunum injury as the commonest in blunt abdominal trauma. In 16% cases only ileum was injured and there was involvement of both jejunum and ileum in 10% of patients.

Many factor are responsible for the difference (solid organ versus hollow viscus injury) of this study with Western studies, like early death of the patients with liver or spleen injuries and death at the spot or on the way to hospital due to poor ambulance service, less consciousness of the on lookers policeman, poor health service of the country etc. As such instead of coming to the surgery ward, the patients with solid organ injuries, straight way to the morgue and they were not included by crash injury to gut between spine and blunt object, closed loop rupture due to increased intra abdominal pressure or shearing injury to small gut at fixed point due to decelaration [20]. Mesenteric injury classically associated with injury by seat belt.

Management of bowel injury following blunt abdominal trauma is now considered as teamwork. Early diagnosis and treatment give excellent result in majority of cases. A significant reduction in morbidity and mortality can be achieved by simple measures [20]. Educations of lay people and traffic personnel as well as drivers are important. A broad based simple curriculum on ABC of trauma management should preferably be introduced from the senior section of the school [21]. This would hopefully reduce the time lapse, providers a much needed primary resuscitation to the patient and significantly improves the chances of survival.

CONCLUSION

The outcome of blunt abdominal trauma patients is not as good as expected in our country due to certain prevailing adverse conditions like prolonged transportation time, failure to receive early resuscitation with consequent poor haemodynamic status, delay in receiving definitive surgical treatment etc. have been associated with a poor outcome in the management of such cases. Trauma management is a team work and starts from the first person attending the victim at the site of the incidence. Providing basic health education among the general population can be the initial step to serve the goal, so that no victim in the highways is left unattended and neglected from early primary resuscitation. The hospital, at all levels need to have a standard protocol to manage the trauma victims. Well equipped trauma centers all over the country can reduce the morbidity from delayed effective definitive management of such cases.

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