

Original Research Article

Traumatic gastrointestinal perforation following abdominal trauma: a study in tertiary care centre

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ABSTRACT

Background: The objective of this study was to determine the cause and anatomical distribution of traumatic gastrointestinal perforation and its management.

Methods: A prospective study was conducted in the department of general surgery in a tertiary care centre that has round the clock availability of all radiological investigations. A total 100 cases of the patients presenting with traumatic gastrointestinal injuries were enrolled in the study.

Results: Maximum number (52%) of patients were aged between 21-40 years of age with males to be the most vulnerable group. Most of the patients (86%) presented with blunt abdominal trauma. Road traffic accidents (RTA) (44%) and fall (42%) were the common causes of gastrointestinal injury. Most common site of injury was jejunum accounting for 66%. 72% of the patients underwent primary closure, 12% underwent resection anastomosis and 16% underwent ostomy.

Conclusions: RTA forms the most common mode of gastrointestinal injury. Blunt abdominal trauma is more common than penetrating abdominal trauma. Jejunum is the most commonly injured in gastrointestinal trauma. Early diagnosis and management are the key to decrease mortality and morbidity.

Keywords: Blunt abdominal trauma, Penetrating abdominal trauma, Gastrointestinal injury

INTRODUCTION

Abdominal injuries are frequently seen in the management of trauma patients. Trauma remains the most common cause of death in the first forty years of life and is the third most common cause of death regardless of age.¹ The vital nature of the organs contained within the abdomen makes evaluation and management a priority. Abdomen is the third most common injured region.² Abdominal trauma is classified as either blunt abdominal trauma or penetrating abdominal trauma.³ Bowel injuries can occur by either blunt or penetrating abdominal trauma. Injuries as a result of blunt abdominal trauma is one of the major causes of death in the society.⁴ Penetrating abdominal trauma is mostly diagnosed reliably and easily whereas blunt abdominal trauma is often missed because clinical signs

are less obvious.⁵ Road traffic accidents have become one of the most common problems in the world, resulting in loss of large number of untimely human lives.¹ Most common cause of blunt abdominal trauma is automobile accidents and falls. Patients with blunt abdominal trauma had higher mortality rates than those with penetrating abdominal trauma because of lack of early diagnostic modalities and optimal management.⁶ Following blunt abdominal trauma, deceleration injuries leading to small bowel injuries typically happen where mobile and fixed segments are attached and are vulnerable to shear force injury, that is, the proximal jejunum near the ligament of Trietz or at the distal ileum near ileocecal junction.⁷ Penetrating abdominal trauma may result from firearm, knives and broken glass pieces. 80% of penetrating injuries occur due to firearm and 20% occur due to stab

wounds.⁸ The most commonly injured organs are colon and small intestine and these had the most postoperative complications.⁹

Aims and objectives

The aim and objectives of this study were to determine the cause and anatomical distribution of traumatic gastrointestinal perforation, and to analyse different methods of management of traumatic gastrointestinal perforation and their outcomes.

METHODS

The study was done in the department of general surgery in a tertiary care centre that has round the clock availability of all radiological investigations. The study was performed according to the guidelines of the ethical committee of the institute. The data was tabulated and results were expressed using statistical package for the social sciences (SPSS) software.

Design

This was a prospective study conducted in Government Medical College, Jammu.

Duration

The duration of the study was from August 2021 to February 2022.

Inclusion criteria

All the patients presenting with traumatic gastrointestinal injuries were included in the study.

Exclusion criteria

Abdominal trauma patient without gastrointestinal perforation, and severely injured patients that did not survive the resuscitative measures were excluded from the study.

The study sample was taken from the patients who were admitted in the hospital with history of trauma in whom gastrointestinal injury was suspected. These patients with sudden onset abdominal pain, fever, vomiting, abdominal distension was examined. They were clinically examined for pulse, blood pressure, abdominal distension, tenderness, guarding, rigidity and other clinical signs of peritonitis. After initial assessment and resuscitation, patients were subjected to haematological and radiological investigations. Patients who were haemodynamically stable without any sign of peritonitis were subjected to contrast enhanced computed tomography (CECT) abdomen. Patients who were vitally unstable or had signs of peritonitis on clinical examination were subjected to laparotomy.

RESULTS

In our study, a total of 100 patients with traumatic gastrointestinal perforation were included. Out of 100 patients, 86 were males and 14 were females. Maximum patients (52) were found in the age group of 21-40 years of age (Table 1).

Table 1: Age distribution of the patients with traumatic gut perforation.

S. no.	Age (years)	Male	Female	Total	%
1	≤20	22	06	28	28
2	21-40	50	02	52	52
3	41-60	10	06	16	16
4	>60	04	-	04	04
Total		86	14	100	100

In our study, RTA was the most common mode of trauma with total of 44 patients followed by fall with 42 patients (Table 2).

Table 2: Distribution of patients according to mode of trauma.

S. no.	Mode	Male	Female	Total	%
1	Gunshot	10	-	10	10
2	Fall	30	12	42	42
3	RTA	42	02	44	44
4	Assault	04	-	04	04
Total		86	14	100	100

In our study, 72 patients presented with blunt trauma while 28 presented with penetrating injury. Out of 72 patients with blunt trauma, 60 were males and 12 were females. Out of 28 patients with penetrating trauma, 26 were males with only 02 female patients. In our study, traumatic perforation was most commonly seen in jejunum accounting for 66% of the patients. Jejunum was also the common site of perforation in patients with blunt trauma. In patients with penetrating injury, most common site of perforation was colon seen in 14 patients (Table 3).

Table 3: Distribution according to site of perforation.

Site of perforation	Blunt	Penetrating	Total
Gastric	-	10	10
Jejunum	60	06	66
Ileum	10	04	14
Colon	04	14	18

In most of the patients, primary repair of the perforations was done accounting for 72% of the patients. Resection anastomosis was done in 12% of the patients while 16% of the patients underwent primary repair with stoma (Table 4).

Table 4: Distribution according to surgical intervention.

S. no.	Surgical intervention	Blunt	Penetrating	Total	%
1	Primary repair	56	16	72	72
2	Resection anastomosis	08	04	12	12
3	Primary repair with stoma	10	06	16	16
Total		74	26	100	100

In our study, 95% of the patients were discharged after management while 05% of the patients were expired.

DISCUSSION

Gastrointestinal injuries are leading cause of mortality and morbidity following trauma. Early hospitalization and early diagnosis in our study, maximum incidence of trauma gastrointestinal injury was found in age group of 21-30 years of age with male preponderance (M:F=6.14:1). These findings are comparable to the previous studies who reported similar findings. In the study by Traore et al, the mean age was 25 years with male to female ratio of 13.22.¹⁰ In the study by Bajiya et al, 55% of the patients were in the age group of 21-40 years.¹¹ In another study by Pradhan et al, 48% of the patients were in the age group of 21-40 years with male to female ratio of 5.25:1.¹² In our study, most common mode of injury was RTA accounting for 44% followed by fall accounting for 42% of the patients. In the study by Mukhopadhyay, the common mode of injury was RTA accounting for 55.32% of the patients.¹³ In the study by Troare et al, most common etiology was RTA (36.7%).¹⁰

Similar findings were noted in the study by Bajiya et al.¹¹ In our study, traumatic perforation was most commonly seen in jejunum accounting for 66% of the patients. Jejunum was also the common site of perforation in patients with blunt trauma. In patients with penetrating injury, most common site of perforation was colon seen in 07 patients. In the study by Pradhan, most common site of perforation was small intestine (38%) followed by gastric (16%).¹² In the study by Bajiya et al, most common site of perforation was jejunum (35.9%) followed by ileum (26.9%).¹¹ In the study by Arslan et al, the most common site of perforation was Ileum accounting for 39% which is contrary to our study.¹⁴ In most of the patients, primary repair of the perforations was done accounting for 72% of the patients. Resection anastomosis was done in 12% of the patients while 16% of the patients underwent primary repair with stoma. In the study by Troare et al primary repair was done in 60.15% patients, resection anastomosis in 25% and stoma in 15% of the patients.¹⁰ In the study by Arslan et al primary repair was performed on 71% patients, resection was performed on 23% patients and 3% patients underwent ostomy.¹⁴

Limitations

This study was conducted over a short duration of time with limited sample size during COVID pandemic.

CONCLUSION

Traumatic injury to gastrointestinal tract due blunt and penetrating abdominal trauma is on a rise due to road traffic accidents and more common in adulthood and males. Traumatic gastrointestinal perforation most commonly involve small intestine specifically jejunum and is usually managed by primary closure. Early diagnosis and treatment are of utmost importance. Early surgery is associated with good recovery. Morbidity and mortality is related to delay in diagnosis and management.

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