



Clinico-demographic and anatomical distribution of traumatic gastrointestinal perforation: an observational study

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KEYWORDS

gastrointestinal injury, penetrating abdominal trauma, and blunt abdominal trauma

ABSTRACT

Aim: The aim of the present study was to determine the cause and anatomical distribution of traumatic gastrointestinal perforation and its management.

Methods: The study was done in the Department of Trauma & Emergency Medicine for one year. A total of 200 patients with traumatic gastrointestinal perforation were included.

Results: Out of 200 patients, 170 were males and 30 were females. Maximum patients (51%) were found in the age group of 21-40 years of age. In our study, RTA was the most common mode of trauma with a total of 45% of patients followed by falls with 41% of patients. In our study, 141 patients presented with blunt trauma while 59 presented with penetrating injury. In our study, traumatic perforation was most commonly seen in the jejunum accounting for 65% of the patients. The jejunum was also the common site of perforation in patients with blunt trauma. In patients with penetrating injury, the most common site of perforation was the colon seen in 22 patients. In most of the patients, primary repair of the perforations was done accounting for 70% of the patients. Resection anastomosis was done in 14% of the patients while 16% of the patients underwent primary repair with stoma.

Conclusion: RTA forms the most common mode of gastrointestinal injury. Compared to penetrating abdominal injuries, blunt abdominal trauma occurs more frequently. The most frequent organ damaged in gastrointestinal trauma is the jejunum. Reducing mortality and morbidity requires early diagnosis and treatment.

INTRODUCTION

Trauma has become a major public health challenge accounting for most deaths in the first four decades of life,¹ owing to the increase in domestic violence, use of firearms, road traffic accidents, and, falls from height. Region-wise, the abdomen is the third most commonly injured part of the body. Gastrointestinal perforation is one of the most common causes of intra-peritoneal free air; its detection is important for the diagnosis of life-threatening conditions in patients with acute abdomen. Gastrointestinal tract perforations can occur for various causes (peptic ulcer, inflammatory disease, blunt or penetrating trauma, iatrogenic factors, infections such as typhoid, tuberculosis, etc., foreign body or a neoplasm);

most of these perforations are emergency conditions requiring early recognition and timely surgical treatment.

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Gastrointestinal tract injuries require prompt attention because of the potential for sepsis. Traumatic gastrointestinal tract perforations/ injuries may be caused either by blunt trauma or penetrating abdominal trauma, with blunt trauma being the major cause of death in society.³ The mortality in perforation peritonitis is reported to be sometimes as high as 29%.⁴ Even among traumatic injuries, about one-third of patients have abdominal injuries and they account for a large fraction of loss of life.⁵



Penetrating abdominal trauma is mostly diagnosed reliably and easily whereas blunt abdominal trauma is often missed because clinical signs are less obvious.⁶ Road traffic accidents have become one of the most common problems in the world, resulting in loss of large number of untimely human lives.⁷ The 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 a lack of early diagnostic modalities and optimal management.⁸ The present study aimed to determine the cause and anatomical distribution of traumatic gastrointestinal perforation and its management.

MATERIALS AND METHODS

The study was done in the Department of Trauma & Emergency Medicine, a level 1 trauma center in central India for one year. A total of 200 patients with traumatic gastrointestinal perforation were included. All the patients presenting with traumatic gastrointestinal injuries were included in the study. Patients with severe injuries who did not survive resuscitation efforts and

those with abdominal trauma who did not have a gastrointestinal perforation were excluded from the study.

The study sample was taken from the patients who were admitted to the hospital with a history of trauma in whom gastrointestinal injury was suspected. These patients with sudden onset abdominal pain, fever, vomiting, and abdominal distension were examined. Their pulse, blood pressure, abdomen distension, tenderness, guarding, rigidity, and other clinical symptoms of peritonitis were all assessed clinically. After initial assessment and resuscitation, patients were subjected to hematological and radiological investigations. Patients who were hemodynamically 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 exploratory laparotomy. The data was tabulated and results were expressed using a statistical package for the social sciences (SPSS) software.

RESULTS

Table 1: Age distribution of the patients with traumatic bowel perforation

Age (years)	Male	Female	Total	%
≤20	43	15	58	29
21-40	97	5	102	51
41-60	24	10	34	17
>60	6	-	6	3
Total	170	30	200	100

Out of 200 patients, 170 were males and 30 were females. Maximum patients (51%) were found in the age group of 21-40 years of age.

Table 2: Distribution of patients according to mechanism of injury (MOI)

Mode	Male	Female	Total	%
Gunshot	22	-	22	11
Fall	58	24	82	41
RTA	84	6	90	45
Assault	6	-	6	3
Total	170	30	200	100

In our study, RTA was the most common mechanism of injury with total of 45% patients followed by fall with 41% patients.



Table 3: Distribution according to site of bowel perforation

Site of perforation	Blunt	Penetrating	Total
Gastric	-	16	16
Jejunum	115	15	130
Ileum	18	6	24
Colon	8	22	30

In our study, 141 patients presented with blunt trauma while 59 presented with penetrating injury. In our study, traumatic perforation was most commonly seen in the jejunum accounting for 65% of the patients. The jejunum was also a very common site of perforation in patients with blunt abdominal trauma. In patients with penetrating injury, the most common site of perforation was the colon seen in 22 patients.

Table 4: Distribution according to surgical intervention

Surgical intervention	Blunt	Penetrating	Total	%
Primary repair	110	30	140	70
Resection anastomosis	16	12	28	14
Primary repair with a stoma	15	17	32	16
Total	141	59	200	100

In most of the patients, primary repair of the perforations was done accounting for 70% of the patients. Resection anastomosis was done in 14% of the patients while 16% of the patients underwent primary repair with stoma.

DISCUSSION

Abdominal trauma is classified as either blunt abdominal trauma or penetrating abdominal trauma.⁹ 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.¹⁰ Penetrating abdominal trauma is mostly diagnosed reliably and easily whereas blunt abdominal trauma is often missed because clinical signs are less obvious.¹¹ Also, unrecognized abdominal injury remains a frequent cause of preventable death in trauma. Surgery is the cornerstone of treatment for intestinal perforations, with the goals of peritoneal lavage, patient safety, and perforation closure. Diagnostic delay exceeding eight hours before surgical repair is associated with increased morbidity and probably with mortality.¹²

Out of 200 patients, 170 were males and 30 were females. In the study by Traore et al, the mean age was 25 years with a male-to-female ratio of 13.22.¹³ In the study by Bajiya et al, 55% of the patients were in the age group of 21-40 years.¹⁴ Maximum patients (51%) were found in the age group of 21-40 years of age. 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 5.25:1.¹⁵ In our study, RTA was the most common mode of trauma with a total of 45% of patients followed by fall with 41% patients. In the study by Mukhopadhyay, the common mode of injury was RTA accounting for 55.32% of the patients.¹⁶

In our study, 141 patients presented with blunt trauma while 59 presented with penetrating injury. This has been supported by the results of a study by Exadaktylos et al in South Africa who found the proportion to be 80% penetrating and 20% blunt.¹⁷ Another study by Edino and his group also found that the pattern of abdominal injuries is more often penetrating than blunt.¹⁸ The small intestine was the most commonly injured in blunt injury in the other studies.¹⁹⁻²¹ In our study, traumatic perforation was most commonly seen in jejunum accounting for 65% of the patients. The jejunum was also the common site of perforation in patients with blunt trauma. In patients with penetrating injury, the most common site of perforation was the colon seen in 22 patients. In most of the patients, primary repair of the perforations was done accounting for 70% of the patients. Resection anastomosis was done in 14% of the patients while 16% of the patients underwent primary repair with stoma. In the study by Arslan et al, the most common site of perforation was Ileum accounting for 39% which is contrary to our study.²²



CONCLUSION

Due to blunt and penetrating abdominal trauma, gastrointestinal tract trauma is becoming more common in adult males and is more likely to occur in road traffic accidents. Traumatic gastrointestinal perforation most commonly involves the small intestine specifically the 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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