e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2022; 14(10); 526-530

Original Research Article

To Determine the Cause and Anatomical Distribution of Traumatic Gastrointestinal Perforation, and to Analyze Different Methods of Management of Traumatic Gastrointestinal Perforation and Their Outcomes

Kashinath Pandit[1], Sumit Mishra[2], Chandra Mohan Sinha[3]

[1]Senior Resident, Department of General Surgery, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar, India
[2]Senior Resident, Department of General Surgery, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar, India
[3]Associate Professor, Department of General Surgery, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar, India

Received: 25-08-2022 / Revised: 20-09-2022 / Accepted: 11-10-2022
Corresponding author: Dr. Sumit Mishra
Conflict of interest: Nil

Abstract

Aim: The aim of the present study was to determine the cause and anatomical distribution of traumatic gastrointestinal perforation, and to analyze different methods of management of traumatic gastrointestinal perforation and their outcomes.

Methods: The study was done in the Department of General Surgery, Jawaharlal Nehru medical College and hospital, Bhagalpur, Bihar, India for the period of nine months that has round the clock availability of all radiological investigations. In our study, a total of 120 patients with traumatic gastrointestinal perforation were included.

Results: In our study, a total of 120 patients with traumatic gastrointestinal perforation were included. Out of 120 patients, 100 were males and 20 were females. Maximum patients (64) were found in the age group of 21-40 years of age. In our study, RTA was the most common mode of trauma with total of 50 patients followed by fall with 45 patients.

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 involves small intestine specifically jejunum and is usually managed by primary closure.

Keywords: Abdominal Trauma, Outcomes, patient, Penetrating abdominal trauma

Introduction

Trauma is the study of medical problems associated with physical injury. The injury is the adverse effect of a physical force upon a person. Trauma is the leading cause of death and disability in developing countries and the most common cause of death under 45 years of age. Countries across the world are going through major urbanization, motorization, industrializations and alteration in the socioeconomic values. India is no different to this changing trend. Due to these changes, road traffic accidents have become the most important public hazard

in the world, resulting in one of the largest threats against human lives and safety. [1] India is the leading country in the number of deaths due to Road traffic accidents. [2] Abdomen is the third most common injured region with injuries requiring surgery in about 25% of civilian trauma victims. [3] The abdomen is vulnerable to injury since there is minimal bony protection for underlying organs. [4] In developing countries, trauma in general and abdominal trauma in particular is increasing at a fast rate due to increase in urbanization, motorization, civil violence, wars and criminal activities. [4] Abdominal trauma is traditionally classified as either blunt or penetrating. [5] Blunt abdominal trauma predominates in rural areas, while penetrating ones are more frequent in urban settings. [6] Road traffic accidents are the commonest cause of blunt abdominal trauma in civilian practice. [7]

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. [8] 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. [9] 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. [10] The most commonly injured organs are colon and small intestine and these had the most postoperative complications. [11]

The aim of the present study was to determine the cause and anatomical distribution of traumatic gastrointestinal perforation, and to analyze different methods of management of traumatic gastrointestinal perforation and their outcomes.

Methods

The study was done in the Department of General Surgery, Jawaharlal Nehru medical College and hospital, Bhagalpur, Bihar, India for the period of nine months that has round the clock availability of all radiological investigations. In our study, a total of 120 patients with traumatic gastrointestinal perforation were included. 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.

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.

Methodology

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 perotinitis. After initial assessment and resuscitation, patients were subjected to haematological and radiological investigations. Patients who were haemodynamically stable without any sign of perotinitis were subjected to contrast enhanced computed tomography

(CECT) abdomen. Patients who were vitally unstable or had signs of perotinitis on clinical examination were subjected to laparotomy.

Results

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

Age (years)	Male	Female	Total	%
≤20	20	8	28	23.3
21-40	60	4	64	53.3
41-60	15	8	23	19.2
>60	5	0	5	4.2
Total	100	20	120	100.0

In our study, a total of 120 patients with traumatic gastrointestinal perforation were included. Out of 120 patients, 100 were males and 20 were females. Maximum patients (64) were found in the age group of 21-40 years of age (Table 1).

Table 2: Distribution of patients according to mode of trauma

Mode	Male	Female	Total	%
Gunshot	15	-	15	12.5
Fall	30	15	45	37.5
RTA	45	5	50	41.66
Assault	10	-	10	8.34
Total	100	20	120	100

In our study, RTA was the most common mode of trauma with total of 50 patients followed by fall with 45 patients (Table 2).

Table 3: Distribution according to site of perforation

Site of perforation	Blunt	Penetrating	Total N (%)
Gastric	0	12	12 (10.0)
Jejunum	65	6	71 (59.2)
Ileum	10	7	17 (14.2)
Colon	5	15	20 (16.7)
Total	80	40	120 (100.0)

In our study, 80 patients presented with blunt trauma while 40 presented with penetrating injury. In our study, traumatic perforation was most commonly seen in jejunum (59.2%). 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 15 patients.

Table 4: Distribution according to surgical intervention

Surgical intervention	Blunt	Penetrating	Total N (%)
Primary repair	55	20	75 (62.5)
Resection anastomosis	15	10	25 (20.84)
Primary repair with stoma	10	10	20 (16.66)
Total	80	40	120 (100.0)

In most of the patients, primary repair of the perforations was done accounting for 62.5% of the patients. Resection anastomosis was done in 20.84% of the patients while 16.66% of the patients underwent primary repair with stoma (Table 4).

Discussion

Abdominal trauma continues to be a major cause of trauma admission all over the world and contributes significantly to high morbidity and mortality. [12] In agreement with other studies, the majority of

abdominal trauma patients in the present study were found to be young in their third decade of life and tended to affect more males than females. [13-16] This group represents the economically active age and the reason for the high incidence of abdominal trauma in this age group reflects their high activity levels and participation in high risk activities.

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. 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. [17] In the study by Bajiya et al, 55% of the patients were in the age group of 21-40 years. [18] 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. [19] In our study, most common mode of injury was RTA accounting for 41.66% followed by fall accounting for 37.5% of the patients. In the study by Mukhopadhyay, the common mode of injury was RTA accounting for 55.32% of the patients [20] In the study by Troare et al, most common etiology was RTA (36.7%). [17]

In patients with penetrating injury, most common site of perforation was colon seen in 15 patients. In the study by Pradhan, most common site of perforation was small intestine (38%) followed by gastric (16%). [19] In the study by Bajiya et al, most common site of perforation was jejunum (35.9%) followed by ileum (26.9%). [18] In the study by Arslan et al, the most common site of perforation was Ileum accounting for 39% which is contrary to our study. [21] In most of the patients, primary repair of the perforations was done accounting for 72% of the patients. Resection anostomosis 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. [17] 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. [21,22]

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 involves small intestine specifically jejunum and is usually managed by primary closure. Younger people and males were commonly affected, and the most common complications were surgical site infection. Furthermore, larger multicentre studies are needed to evaluate the trauma care capability of health care facilities in our region and the impact of trauma to our population. We recommend early and easy availability of ambulance and bedside imaging for trauma patients to avoid longer waiting times for operations.

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