
FREQUENCY OF DIFFERENT CLINICAL PRESENTATIONS AND OUTCOME OF TRAUMATIC SMALL BOWEL PERFORATION

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ABSTRACT

Objective:- The purpose of the study was to elucidate the different presentation, treatment modalities and their outcomes in term of management of traumatic small bowel perforation.

Study Design: Retrospective cohort study.

Study duration of Study and setting: The current study was conducted at Department of General Surgery, Nishtar Hospital Multan, Pakistan, from May 2025 to September 2025

Methodology: There were 40 patients selected for analysis, who met the inclusion criteria. The data for age group, gender type, body mass index (BMI), mechanism of injury, type of trauma (blunt or penetrating), clinical presentation, surgical procedure performed, complications appears after surgery, duration of stay in hospital and frequency of mortality were recorded. Statistical software, SPSS version-25 was used for data analysis. To verify that the data was normal, the Shapiro-Wilk test was performed.

Results: The results demonstrate that 40 patients were diagnosed with traumatic small bowel perforation. The majority of patients were male 27 (67.50%), while females accounted for 13 (32.5%) of cases. The mean age of patients was 34.2 ± 11.6 years. Higher values of motor vehicles accidents were found (57.50%) followed by fall from height (25%) and minimum values were recoded 17.5% for assault. The most common clinical presentation was abdominal pain (52.50%), followed by abdominal distension (22.5%) and abdominal rigidity (15%). Surgical management included primary repair in 60% of cases and resection with anastomosis in 40%. Postoperative complications occurred in 37.5% of patients, including wound infection, anastomotic leak, and peritonitis. The overall mortality rate was 17.5%. Logistic regression analysis had not identified any statistically significant variance of mortality.

Conclusion: A rare but dangerous side effect of abdominal trauma that has a high morbidity and mortality rate is traumatic small bowel perforation. Motor vehicle accidents remain the most common cause. Early diagnosis and prompt surgical intervention are essential for improving patient outcomes. Motor vehicle accidents remain the most common cause.

KEYWORDS: Small bowel perforation, abdominal trauma, motor vehicle accidents, intestinal injury, surgical outcomes.

1. INTRODUCTION

Bowel perforation, also referred to as intestinal perforation, is a disruption in the integrity of the bowel wall that results in leakage of intestinal contents into the peritoneal cavity¹. This condition represents a surgical emergency and can

lead to severe peritonitis, sepsis, and death if not promptly treated. There are two main factors that can lead to small bowel perforation (SBP), traumatic and non-traumatic factors². Non-traumatic causes include infections, inflammatory diseases, ischemia, malignancy, and iatrogenic injury, while traumatic causes are usually related to blunt or penetrating abdominal trauma. Road traffic accidents are the major cause of small bowel injuries among traumatic causes, especially when people are wearing seat belts in high-velocity collisions³. Due to the challenges with diagnosing them, small bowel injuries continue to be clinically significant even though hollow viscus injuries are occasional than solid organs including kidney, heart and liver injuries in abdominal trauma. Abdominal pain, hypertension, nausea, peritonitis, and hemodynamic instability are some of the clinical manifestations of SBP. Sometimes symptoms take longer to manifest, which can lead to a delayed diagnosis and higher morbidity. Computed tomography (CT) scans are considered the ideal imaging modality for patients with a potential bowel injury who are hemodynamically stable⁴. However, early clinical suspicion is important because imaging results can occasionally be subtle. Prompt resuscitation, broad-spectrum antibiotic administration, and surgical procedures like primary repair or resection with anastomosis are commonly used in management⁵. Despite developments in diagnostic imaging and clinical operating techniques, traumatic small bowel perforation remains to be interlinked with substantial morbidity and death rate. Moreover, there is limited local data available in terms of clinical signs at presentation and outcomes of this condition in patients presenting with abdominal trauma in Pakistan. Therefore, the current research work was conducted to explore the frequency of clinical presentations and outcomes of traumatic small bowel perforation.

2. MATERIALS AND METHODS

Design and Setting of the Study: Following ethical clearance from the Institutional Review Board of Nishtar Medical College Multan (Approval No: REU/SGR-2022-099-14035/Dated: 05/05/2025), this retrospective cohort study was carried out at the Department of General Surgery, Nishtar Hospital Multan, Pakistan.

Objective:- The purpose of the study was to elucidate the different presentation, treatment modalities and their outcomes in term of management of traumatic small bowel perforation.

Study Duration: Medical records of patients presenting with abdominal trauma were collected and received during May 2025 and September 2025.

Inclusion and Exclusion criteria: Patients having 20-60 year age of both gender diagnosed with traumatic small bowel perforation confirmed during exploratory laparotomy were included in the study. Patients with isolated large bowel perforation, incomplete medical records, or non-traumatic bowel perforations and chronic liver or renal failure were excluded.

Data collection: Sample size was calculated by using WHO calculator on means differences with 80% power and a 95% confidence level. There were 40 patients selected for analysis, who met the inclusion criteria. The data for age group, gender type, body mass index (BMI), mechanism of injury, type of trauma (blunt or penetrating), clinical presentation, surgical procedure performed, complications appears after surgery, duration of stay in hospital and frequency of mortality were recorded. Depending on intraoperative findings, management choices involved either primary repair of the perforation or resection with anastomosis. Surgical site infection, peritonitis, anastomotic leak, intestinal obstruction, reoperation, and mortality were among the postoperative complications that patients were observed for.

Data Analysis: Statistical software, SPSS version-25 was used for data analysis. To verify that the data was normal, the Shapiro-Wilk test was performed. The mean \pm standard deviation was used to represent continuous variables, whereas frequencies and percentages were used to portray categorical variables. A logistic regression analysis was used to identify mortality factors. A p-value of less than 0.05 was deemed statistically significant.

3. RESULTS

Demographic Characteristics

The Result (Table 1) demonstrated that 40 patients were diagnosed with traumatic small bowel perforation. There were higher values of patients 15 (37.50%) with 31-35 years age group were recorded and followed by 7 (17.50%) patients with 36-40 years age group. Minimum values were recorded for summit. The patients' average age was 34.2 ± 11.6 years. Beside of these, most of patients were male (67.50 %), while females accounted for 13 (32.50%) of cases.

Table 1: Exhibiting Demographic Characteristics of Patients (n = 40)

Variable	Patients	Frequency (%)
20-25	1	2.50
26-30	2	5.00
31-35	15	37.50

Variable	Patients	Frequency (%)
36-40	7	17.50
41-45	5	12.50
46-50	4	10.00
51-55	3	7.50
56-60	2	5.00
60>	1	2.50
Total	40	100
Sex distribution		
Male	27	67.50
Female	13	32.50
Mean values of Age & BMI		
Mean Age		34.2 ± 11.6 years
Mean BMI		24.1 ± 3.2

Mechanism of Injury

The results (Table 2) demonstrated that motor vehicle accidents were the major factor inducing the injury in local population.

Table 2: Exhibiting Mechanism of Injury

Mechanism	Cases	Frequency (%)
Motor Vehicle Accident	23	57.50
Fall from Height	10	25.00
Assault	7	17.50
Total	40	100

Clinical Presentation

The most common presenting symptom was abdominal pain.

Table 3: Exhibiting Clinical Presentation

Clinical Feature	Cases	Frequency (%)
Abdominal Pain	21	52.50
Abdominal Distension	9	22.50
Abdominal Rigidity	6	15.0
Hypotension	3	7.50
Absent Bowel Sounds	1	2.50

Surgical Procedures

Primary repair was performed in the majority of patients 24 (60%).

Table 4: Exhibiting Type of Surgical Procedure

Procedure	Cases	Frequency (%)
Primary Repair	24	60.00
Resection with Anastomosis	16	40.00
Total	40	100

3.5: Postoperative Outcomes

Complications were observed in 33 patients. Wound infection was observed in 17 (42.0%) patients (Table 5). Peritonitis was observed in 7(17.50%) patients. Intestinal Obstruction and Reoperation complications were observed in 2 patients respectively. However, Mortality rate was observed in 7 (17.50%) patients.

Table 5: Exhibiting Postoperative Complications

Complication	Patients	Frequency (%)
Wound Infection	17	42.50
Peritonitis	7	17.50
Anastomotic Leak	5	12.50
Intestinal Obstruction	2	5.00
Reoperation	2	5.00
Mortality Rate	7	17.50

The Results described that overall mortality rate was 17.50% (7patients). The duration in hospital stay was 14 ± 4.5 days. Logistic regression analysis did not demonstrate any statistically significant predictors of mortality among the variables studied.

4: DISCUSSION

A major consequence of abdominal trauma is traumatic small bowel perforation, which has a high morbidity and death rate. After the chest and head injury, small bowel perforation of abdominal injury is the third cause of traumatic death⁶. If prompt diagnosis and management are delayed, the morbidity and fatality rates from blunt abdominal injuries can rise dramatically. 25–35% of deaths occur if the condition is not identified and treated promptly⁷. Owing the importance of this crucial issue, the current research work was conducted to provide insight comprehensive guide line in terms of factors effecting the frequency of clinical presentations and outcomes of traumatic small bowel perforation. In the present study, 40 patients presenting with abdominal trauma of small bowel perforation were included. The majority of patients in this study were young males, which reflects the higher exposure of this demographic group to high-risk activities and road traffic accidents. Similar findings have been reported by Fattani et al⁷. In Pakistan and Rana et al.⁸ in Bangladesh where males accounted for more than 60% of traumatic bowel injury cases. Motor vehicle accidents were the most common mechanism of injury in this study, accounting for 57.5% of cases. This result is in line with earlier research conducted by Mohsin et al.⁴ showing that traffic accidents are the primary global cause of blunt abdominal trauma. Beside of these, Qzpek et al⁹ described that in patients with acute abdominal trauma, hollow viscus injuries (HVI) are less common than solid organ injuries, which may result in much higher rates of morbidity and fatality. Hollow viscous injuries may go undetected by contemporary imaging technology that is reliably used to diagnose solid organ injuries. The increasing number of vehicles and inadequate road safety measures may contribute to the high incidence of trauma-related injuries in developing countries⁶⁻⁹. Abdominal pain was the most common presenting symptom in our study, followed by abdominal distension and rigidity. These findings are in agreement with Fattani et al.⁷, indicating that peritoneal irritation and inflammatory response are typical clinical manifestations of bowel perforation. These findings were evident from the research published by Siddique et al¹⁰. However, the diagnosis of SBP may sometimes be delayed because early symptoms can be subtle or non-specific. Regarding surgical management, primary repair was the most frequently performed procedure in this study. This surgical technique is usually adopted when perforation is small size and slightly minimal injury. Beside of these, the patients in which bowel perforation was noticeably damaged, resection with anastomosis surgical technique was applied. The results of present study demonstrated that 37.5% was the overall complication rate in terms of postoperative outcomes. These results were comparable with the findings of Afridi et al.⁵ and the findings reported by Aljehaiman et al¹¹. The results showed that the mean hospital stay was 14 ± 4.5 days, the overall mortality rate was 17.5% (7 patients), and no statistically significant predictors of mortality were found among the factors examined by logistic regression analysis. Similar trends were also reported by Mohamed et al¹³ and Bag et al¹⁴. In the present investigation, considering type of surgical procedure, out of 60, about 24 patients were subjected with primary repair and 16/40 patients were documented for resection with anastomosis. Similar findings were also reported by Saadeldien¹⁵. Furthermore, the results demonstrated that age and gender is another significant factor, because Awuah et al¹⁶ reported that in underdeveloped countries most of the injured patients were male and their age was less than 30 year. The clinical outcomes represented by Haylock et al¹⁷ and Kuan¹⁸ also support the findings of current investigation, The above cited outcomes demonstrated that impact of trauma severity, limited access to early diagnostic services, delayed presentation are the encountering factors for the management of abdominal small bowel perforation injury. Furthermore, the present study was single centered retrospective and study sample was small. For achievement the

better outcomes in term of exploring the epidemiology and traumatic small bowel perforation treatment by surgical approaches, in future multi-centered study should be established with larger population sample.

5. CONCLUSION

Small bowel injury is a common abdominal issue and caused by motor vehicles accidents. Numerous factors played significant role to obtain the favorable outcomes in term of management of small bowel perforation. The time between the inception of symptoms and immediately presenting to surgeon, adequate resuscitation and uses of proper antibiotics always improve the outcomes. The findings of present study suggested that in order to reduce morbidity and mortality among these patients, there should be prompt intervention, early diagnosis and appropriate post-operative care is admissible.

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