

Treatment Modalities of Traumatic Perforation of Small Gut and Factors Influencing the Outcome: A Study of 53 Cases

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Abstract

Background: Traumatic perforation of the small intestine is a life-threatening surgical emergency, particularly prevalent in low- and middle-income countries where road traffic accidents and interpersonal violence are common. In Bangladesh, abdominal trauma contributes significantly to surgical admissions, with small bowel injuries accounting for 20–25% of intra-abdominal trauma. Despite global advances in trauma care, delayed presentation and limited diagnostic resources continue to hinder optimal outcomes.

Method: A retrospective analysis was conducted on 53 patients with traumatic small bowel injuries admitted to Dhaka Medical College Hospital between July 2002 and June 2003. Inclusion criteria were confirmed small gut injury via laparotomy following either blunt or penetrating trauma. Data were extracted from clinical records, including demographics, mechanism of injury, presentation, operative findings, treatment modalities, and postoperative outcomes. Surgical intervention was guided by clinical deterioration, signs of peritonitis and investigation findings.

Results: Blunt trauma accounted for 56.6% of cases, predominantly from road traffic accidents, while penetrating injuries comprised 43.4%, mainly gunshot wounds. The majority of patients were young males (mean age 34.7 years). Jejunal injuries were most frequent, and early laparotomy within 12 hours correlated with reduced mortality and complications. Overall mortality was 3.77%, with postoperative complications in 41.5% of cases—most commonly wound infection, dehiscence, and anastomotic leakage.

Conclusion: Timely diagnosis, prompt surgical intervention, and comprehensive perioperative care are critical to improving outcomes in traumatic small bowel injuries. This study highlights the need for enhanced emergency response systems, improved diagnostic capabilities, and access to surgical expertise, particularly in resource-constrained settings. Strengthening these areas can significantly reduce morbidity and mortality associated with abdominal trauma.

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Introduction:

Trauma represents a major public health problem. It is the principal cause of death during the first half of normal human life span and the fifth leading cause of death for all age groups.¹ In persons under the age of 30, trauma is responsible for more deaths than all other diseases put together. Abdomen is one of the common sites of the body susceptible to various injuries due to its wider surface area, lack of protection and easily approachable height. Injuries to the intra-abdominal organ may result from blunt trauma (road traffic accidents,

assault, falls from a height, crushing etc.), penetrating and perforating injuries (stab, bullet missile, sharp instruments, spikes of glass, wood of metal etc.) and blast trauma.

In traumatic abdominal injury the small intestine is commonly involved viscera (20–25%). Because, the small intestine is occupied most of the abdominal cavity below the liver and the stomach and remains in contact with the anterior abdominal wall and against the vertebral column or sacrum, it can easily be compressed between vertebral column and

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injurious agents.² The morbidity and mortality for abdominal injuries were quite high. But today the rate has been reduced significantly as compared to previous one. The factors responsible for this are – (a) modern diagnostic facilities, (b) early recognition, (c) early operation, (d) a better understanding of pathophysiology of haemorrhage, shock, sepsis and provision of facilities for its treatment, (e) improved pre and post operative care, (f) improved surgical care, (g) adequate and selective use of antibiotics. Anaesthesiologist, diagnostic radiological facilities, intensive nursing care, ready availability of an adequate supply of blood products and a modern operating room remain the other key elements in successful trauma care. Outcome measures were mortality rate, rates of anastomotic leakage, intra-abdominal and wound sepsis, fascial dehiscence and pulmonic complications.

In this series a study of 53 cases on traumatic small bowel injury was conducted with special reference to type and mechanism of injury, age incidence, sex distribution, presentation, pattern with distribution of small gut injuries, operative findings and outcomes of the management of the patients with abdominal trauma.

Aims and Objectives

- To assess the site of trauma and nature of injury.
- To see the pattern of small bowel injury in blunt abdominal trauma.
- To evaluate the risk factors associated with blunt abdominal trauma.
- To outline the determinants for surgical intervention with minimum investigative procedures.
- To analyse the outcomes of different surgical procedures in traumatic small gut injury.

Materials and Methods

This is a retrospective study and 53 patients of abdominal trauma, both penetrating and non-penetrating injury admitted in casualty department of Dhaka Medical College Hospital were included in this series during the periods from July 2002 to June 2003. The patients died preoperatively, and those clinically diagnosed as small bowel injury but on laparotomy injury were detected in large gut, were not included

in this study.

Detail history and clinical examination of the patients were undertaken immediately after admission. But when needed immediate resuscitative measures were instituted before going for detailed history and clinical examination. The clinical examination stressed on pulse rate, blood pressure, respiratory rate, state of hydration, level of consciousness, anaemia, degree of abdominal distention, muscle guard, rebound tenderness, presence or absence of bowel sound and extra-abdominal injuries.

Relevant investigations as far as possible were done and recorded. In these patients requiring urgent laparotomy, all routine investigations were not possible because of lack of urgent laboratory facilities. The investigations that could be done on urgent basis were plain X-ray abdomen and chest, Focus Assessment with Sonography for Trauma (FAST), Hb%, blood grouping & cross matching. In a few patients abdominal paracentesis was done but no cases were subjected to peritoneal lavage.

After resuscitation patients were taken to the operation theatre. Criteria for laparotomy were penetrating injury, signs of peritonitis, pneumoperitoneum, evisceration, positive peritoneal tap and deterioration of clinical status on routine follow up. Detailed operative findings and procedures were recorded. A careful record of hospital stays, the post operative complications and their management were done. Information regarding particulars of the patients, history, clinical examination relevant investigations, treatment and ultimate outcome of treatment were recorded from the admission and treatment record files in the standardized protocol purposed for this study.

Results

Table-I

Nature of trauma (penetrating / blunt) (n=53)

Nature	Number of patients	Percentage (%)
Penetrating	23	43.40
Blunt	30	56.60
Total	53	100.00

Out of 53 patients in this series 23(43.40%) were penetrating and 30 (56.60%) were blunt injuries.

Table II
Types of penetrating trauma (n=23)

Types	Number of patients	Percentage (%)
Stub	5	21.74
Bullets/ Gunshot	17	73.91
Sharp instruments	1	4.35
Total	23	100.00

Out of 23 patients of penetrating trauma in this series, stab injury was 5 (21.74), gunshot injury 17 (73.91%) and sharp instrument 1(4.35%).

Table III
Types of blunt trauma (n=30)

Types	Number of patients	Percentage (%)
Road-traffic accident	24	80
Assault	3	10
Fall from height	2	6.67
Fall of heavy object on the abdomen	1	3.33
Total	30	100

Out of 30 patients of blunt trauma in this series, 24(80%) cases were from road traffic-accidents, 3 (10%) from assault, 2(6.67%) fall from height and 1 (3.33%) from fall of a heavy object on the abdomen.

Table – IV
Age distribution of the patients (n=53)

Age in years	Number of patients	Percentage (%)
0-10	1	1.89
11-20	8	15.09
21-30	20	37.74
31-40	15	28.30
41-50	7	13.21
51-60	2	3.77

Age of the patients in this series ranged from 10-59 years, with the highest incidence (37.74%) in patients between 21-30 years,

followed by age group 31-40 (28.30 %) years. The mean age 34.72 years. One patient at ten and two patients were over 51 years old.

Table V
Sex distribution of patients (n=53)

Sex	Number of patients	Percentage (%)
Male	51	96.23
Female	2	3.77
Total	53	100

From the above table out of 53 patients we see that 51 (96.23) patients were male whereas only 2 (3.77%) patients were female. So, the male to female ratio was (M: F = 25.53:1)

Table VI
Clinical presentation (n=100)

Symptoms and signs	Number of cases	Percentage (%)
Abdominal pain	50	94.35
Vomiting	4	7.55
Dyspnoea	8	15.09
Hypotension	16	30.19
Dehydration	20	37.74
Anaemia	13	24.53
Haematuria	1	1.89
Abdominal distension	18	33.96
Rigidity	40	75.47
Tenderness	50	94.34
Absent bowel sound	35	66.04
Obliteration of liver dullness (upper border)	35	66.04
Evisceration	2	3.77
Extra abdominal injuries	5	9.43

In the traumatic abdominal injury almost all of the patients had pain and tenderness in the abdomen (94.34%). 40 cases presented with abdominal rigidity. Absent bowel sound and obliteration of liver dullness (upper border) were in 35 cases each. 20 cases were dehydrated and 13 cases were anaemic.