

Post-Operative Complications and Outcome of 150 Traumatic Gut Injury Cases

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How to citation this article: Subrata Kumar Roy, Md. Babul Akter, B S M Arshad, “Post-Operative Complications and Outcome of 150 Traumatic Gut Injury Cases”, IJMACR- September – October - 2022, Vol – 5, Issue - 5, P. No. 247 - 256.

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Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Introduction: One of the most common abdominal crises is a perforation of the gastrointestinal system. The number of admitted trauma patients is only the tip of the iceberg because the majority of these unfortunate persons with abdominal trauma die on the route to the hospital. The study's goal was to determine what we should do to combat this pandemic and what efforts should be made to minimize mortality and improve morbidity. Although, in compared to the enormous number of Western cases, this little research cannot make a solid conclusion. The aim of the study was to observe the post-operative complications and outcome of traumatic gut injury cases.

Methods: This cross-sectional observational study was conducted at the Department of Surgery, Sylhet M.A.G Osmani Medical College, Sylhet, Bangladesh during the period from January 2018 to December 2019. A total of 150 cases were selected for the purpose of this study

from those admitted to the study hospital due to traumatic gut injury.

Collected data was checked, edited, and entered into the computer program Statistical Package for Social Science (SPSS). Both descriptive and inferential statistics were used in the process of data analysis.

Result: The bulk of the patients were males in their twenties. Penetrating groups (60 percent) outnumber blunt groupings (40%). Stabbing and gunshot wounds were the most common causes of penetrating injuries, whereas road traffic accidents were the most common source of blunt trauma. On admission, 58 percent of patients were in shock, and 48 percent had related extra-abdominal damage. 52 percent of patients were successfully resuscitated using blood and I/V fluid, and the majority of them were resuscitated within 1-4 hours. The diagnosis was made mostly on the basis of clinical presentation and with the assistance of very little

research. The vast majority of patients (72%) were operated on within 24 hours of their hospitalization. The small intestine was the primary organ affected. For operational management, a variety of methods were used, but the most common was simple repair and resection with end-to-end anastomosis. Wound infection and urinary tract infection were the most common post-operative problems, affecting 26% and 20% of individuals, respectively. The overall mortality rate was 6%.

Conclusion: Among post-operative complications, wound infection and urinary tract infection were the most common presentations. The study observed 6% mortality, all of whom were operated more than 12 hours after their initial injury.

Keywords: Trauma, Abdominal, Injury, Infection, Gut

Introduction

The human body is exposed to a growing quantity and diversity of external pressures, such as falls, blows, piercing wounds from sharp objects, gunshot wounds, workplace accidents, and not to mention auto accidents. The abdomen covers a sizable portion of the body, offers less protection than the chest, and is more vulnerable to injuries since it is closer to the ground.^[1] Despite the fact that the agents that cause wounds seldom respect anatomical boundaries, injuries to the head, chest, and other parts of the trunk and extremities can also affect the abdomen. The frequency of admissions with abdominal trauma is rising in our nation as a result of fast urbanization and rising social instability, especially in rural regions. Abdominal trauma is a highly common surgical emergency. Each year, thousands of people—the majority of whom are young, energetic segments of our population—become crippled or pass away as a result of this type of accident. According to estimates,

1,20,000 persons in the USA pass away from trauma each year, with abdominal trauma accounting for 10% of those fatalities. But in our nation, numbers are not always obvious.^[2] The gastrointestinal tract is the most often afflicted organ, with the stomach accounting for 5 percent, the duodenum for less than 1 percent, and the small intestine for 20 to 25 percent, regardless of the kind of abdominal injury. However, if identified early and treated quickly within the "golden hour," all of these are treatable traumatic disorders. The likelihood of recovery and result are frequently significantly harmed by a delay in detection. In individuals with numerous injuries, traumatic gastrointestinal tract perforation ranks highly among treatable traumatic conditions. Exceptions are granted when they are connected to other ailments (such head and chest traumas) that need urgent special care. Although there hasn't been any research on how gut injuries affect mortality from traumatic perforations of the gastrointestinal system, mortality from abdominal injuries used to be extremely significant (e.g. world war I -53.5 percent ; world war II -25 percent ; Vietnam war 10%). However, as of right now, the rate is less than 5%.^{[3],[4]} Modern diagnostic facilities, early detection and treatment, correct management through improved pre- and post-operative care, and other aspects are the main contributors to the declining death rates. It is only feasible in a facility with a complete complement of diagnostic resources and personnel who are both informed about and enthusiastic about trauma care. But numerous issues, both significant and trivial, may develop when none of these amenities are easily accessible. This is particularly true for developing nations like our own, where the bulk of the population cannot access many of these amenities. Infection, blood loss, and shock are the most frequent symptoms of the

numerous short- and long-term post-operative problems.^{[5],[6]} Only the short-term post-operative problems and results among 150 patients with gastrointestinal injuries were the focus of the current investigation.

Objective

General Objective

- To observe the post-operative complications of traumatic gut injury cases
- To observe the post-operative outcome of traumatic gut injury cases

Methods

This cross-sectional observational study was conducted at the Department of Surgery, Sylhet M.A.G Osmani Medical College, Sylhet, Bangladesh during the period from January 2018 to December 2019. A total of 150 cases were selected for the purpose of this study from those admitted to the study hospital due to traumatic gut injury. All cases present with trauma and distended abdomen meeting the enrollment criteria were consecutively selected and allocated into the groups based on acute cases. Informed written consent was taken from each patient and their privacy and confidentiality were maintained. Each patient in the surgery department was evaluated by taking a careful history, physical examination, and investigations. All findings were recorded in a prescribed data collection sheet. Ethical approval was obtained from the ethical review committee of the study hospital. A structured questionnaire addressing all the variables of interest was developed, and the questionnaire was pre-tested and modified according to the few backs review from field testing. Data was collected on variables of interest from the selected patients using the structured questionnaire. Collected data was checked, edited, and entered into the

computer program Statistical Package for Social Science (SPSS). Both descriptive and inferential statistics were used in the process of data analysis.

Inclusion Criteria

- All patients present with traumatic gut injury irrespective of age and gender
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Patient with traumatic gut injury alongside severe head injury
- Unable to answer the criteria question.
- Injury of the gut other than trauma like duodenal ulcer perforation, ischemic necrosis of the gut, typhoid ulcer perforation, etc.

Results

Table 1: General condition of the patients on admission (n=150)

Condition		Number	Percentage (%)
Hemodynamic status	Good/Stable	63	42
	Shock	87	58
Consciousness	Unconscious	03	02
	Semi-conscious	27	18
	Conscious	120	80

The majority of patients (58%) were in shock on admission. 42% were hemodynamically stable. In regards to consciousness, 80% were conscious, 18% were semi-conscious and one was unconscious.

Table 2: Characteristics of the study population (n=150)

Variables	Number	Percentage (%)
Age group(years)		
0-10	12	08
11-20	42	28
21-30	69	46

31-40	18	12	
41-50	06	04	
51-60	03	02	
Gender			
Male	135	90	
Female	15	10	
Type of Trauma			
Penetrating	90	60	
Blunt	60	40	
Associated Injuries (n=150)			
Head injury	03	3.84	
Thoracic injury	09	11.53	
Fracture	Upper limb	15	19.23
	Pelvis	09	11.53
	Lower limb	09	11.53
Soft tissue	33	42.30	
None	72	48	
Site of GIT Involvement			
Stomach	09	06	
Duodenum	09	06	
Jejunum	60	40	
Ileum	06	04	
Caecum	12	08	
Ascending colon	30	20	
Transverse colon	21	14	
Descending colon	03	02	
Mode of Transport			
Tempo or Baby Taxi	69	46	
Ambulance	30	20	
Rickshaw Van	12	08	
Engine Boat	00	00	
Truck	00	00	
Private Car	12	08	
Multiple	27	18	

The age of the patients in this series ranged from 0-to 60 years. The highest incidence was noted between the ages of 21-30 years (46%) followed by the age group 11-20

years (28%). There were 135 male patients (90%) and only 15 female patients (10%). The male: female ratio was 9:1. Out of 150 patients, 60% sustained penetrating injury and 40% patients sustained blunt trauma. Among the total patients, in regards to associated injuries, 42.03% suffered soft tissue injury, 19.23% patients had associated upper limb fracture, 11.53% patients had a pelvic fracture, 11.53% patients had lower limb fracture, and 11.53% patients had a thoracic injury. Only 3 (3.84%) patient in this series had an associated head injury. Per operative injury to the jejunum was found in the highest number (60 cases) of the patient followed by Ascending colon (30), transverse colon (21) stomach (09), and Duodenum (09), caecum (12), Descending colon (03), ileum. Main transport system involved in the transportation of the injured patient was temp/Baby taxi in 46% of cases. Ambulance was the second most used vehicle at 20%.18% of the patient's used multiple transport system to reach the hospital. Private car and Rickshaw van were used by 08% patients.

Table 3: Time laps between trauma and presentation in casualty

Time lapse(Hour)	Number	Percentage (%)
0-1	45	30
1-6	27	18
6-12	60	40
12-24	18	12

Majority of patients (40%) came to hospital within 6 to 12 hours of sustaining injury. 30% of patients reached hospital within one hour, 18% after 1 hour but within 6 hours and 12% after 12 hours but within 24 hours. Minimum time between trauma and presentation was 35 minutes and maximum time was 24 hours.

Table 4: Types of trauma among the participants (n=50)

Type	Number	Percentage (%)
Penetrating (n=90)		
Stab	36	40
Gunshot	30	33.34
Assault by a sharp instrument	6	06.67
Construction site injury	03	03.33
RTA	12	13.33
Attack by a domestic animal	03	03.33
Blunt (n=60)		
RTA	30	50
Blow/Kick	24	40
Fall from height	06	10

Among the 90 patients with penetrating type of injury, highest incidence was due to stab injury in 40% of patients, followed by Gunshot injury in 30 patients (33.34%), assault by a sharp instrument in 06 patients (6.67%), Road traffic accident (RTA) in 13.34% patients, construction site injury in 03 patients (3.33%) and attack by domestic animal in the remaining 03 patients (3.33%). Among the 60 cases of blunt trauma, 30 patients (50%) sustained injury from RTA, 24 patients (40%) suffered assault (Blow/kick), and 10% were injured by a fall from height.

Table 5: Clinical presentations among the participants

Symptoms and Signs	Penetrating Group (n=90)		Blunt trauma group (n=60)		
	Number	Percentage (%)	Number	Percentage (%)	
Abdominal Pain	84	93.33%	48	80.00%	
Bleeding	63	70.00%	0	0.00%	
Vomiting	51	56.67%	36	60.00%	
Dehydration	45	50.00%	30	50.00%	
Hypotension	48	53.33%	39	65.00%	
Anaemia	30	33.33%	24	40.00%	
Unconsciousness	0	0.00%	3	5.00%	
Abdominal distension	27	30.00%	36	60.00%	
Rigidity	45	50.00%	42	70.00%	
Tenderness	51	56.67%	42	70.00%	
Shifting dullness	36	40.00%	30	50.00%	
Obliteration of liver dullness (upper border)	0	0.00%	36	60.00%	
Absent bowel sound	30	33.33%	27	45.00%	
Evisceration	Omentum	21	23.33%	0	0.00%
	Gut	3	3.33%	0	0.00%
Extra abdominal injury	36	40.00%	42	70.00%	
Skin Abrasion and Bruises	0	0.00%	15	25.00%	
Asymptomatic	0	0.00%	12	20.00%	

90 patients out of 150 had sustained a penetrating injury in the series and their presentations were quite obvious. Abdominal pain was the most common symptom (93.30%), followed by bleeding in 70%, and abdominal distension in 30%. Important signs were dehydration (50%), hypotension (53.33%), shifting dullness (40%), anemia (33.30%), signs of Tenderness (56.67%) & rigidity (50%), evisceration of omentum (23%) and gut (3%). 60 patients in this study sustained blunt trauma

and their clinical presentation was not clear-cut. But a majority (80%) had mild to severe abdominal pain, 60% had vomiting and 20% were asymptomatic. Physical examination revealed dehydration in 50% of patient, hypotension in 60%, and signs of Tenderness and rigidity in about 70% of patients. Extra-abdominal injury was present in 40% of penetration group, and 70% of blunt trauma group.

Table 6: Operative procedure followed in the series (n=150)

Portion of G.I.T.	Procedure	Number	Percentage (%)
Stomach	Primary anatomical repair	18	16
Duodenum	Primary anatomical repair	18	12
Small gut	Primary anatomical repair	60	40
	Resection & anastomosis	33	22
Large gut	Primary anatomical repair	06	04
	Repair & proximal colostomy	30	20
	Repair & proximal de-functioning ileostomy	12	08
	Resection & anastomosis with proximal de-functioning colostomy	15	10
	Exteriorization as a loop colostomy	15	10

For operative procedure, primary anatomical repair of stomach was done in 16% of cases, duodenum in 12%, primary anatomical repair of small gut in 40%, resection and anastomosis of small gut was performed in 22% of cases. For the large gut, 4% had primary anatomical repair, 20% had repair & proximal colostomy, 8% had repair and proximal defunctioning ileostomy, 10% had Resection & anastomosis with proximal defunctioning colostomy, while another 10% had exteriorization as a loop colostomy

Table 7: Post-operative complication (n=150)

Complication	Number	Percentage (%)
Wound dehiscence	09	06
Wound infection	39	26
Pulmonary complication	09	06
Complication of colostomy	06	04
Septicemia	03	02
Urinary tract infection	30	20
Pyrexia	09	06

During the post-operative period, a number of minor and some major complications were observed. Wound infection was observed in 39 cases (26%), and urinary tract infection in 30 cases (20%). Other complications

included pyrexia (06%), complication of colostomy (04%), and septicemia (02%).

Table 8: Recovery and hospital stay affected by organ involvement (n=150)

Recover	Duration	Organ	Number	Percentage
Rapid with mild complications	<15 days	No organ, small gut alone	60	40
Slow with moderate complication	>15 days	Stomach with other organ	48	32
Very slow with complication	>30 days	Colon with other organ	33	22
Death			09	06

Those patients who had only a small gut injury and no other associated injury (40%) left the hospital within 15 days with rapid recovery and minimum complications. Patients who had stomach or duodenum injury with other organs (32%) cases gained slow recovery with moderate complications. 22% of the participants suffered colonic injuries with other organs involved, and had very slow recovery. These patients had to stay at the hospital for over 30 days. The remaining 6% of patients were the only mortalities in this study.

Table 9: Relationship between morbidity & mortality with hospital delay (n=150)

Time between trauma & present action in casualty	No.	Cured (n=96)		Morbidity (n=48)		Mortality (n=9)	
		Total	%	Total	%	Total	%
2-6 hour	30	27	90.00%	3	10.00%	0	0.00%
7-12 hour	63	42	66.67%	24	38.10%	0	0.00%
13-24 hour	45	27	60.00%	15	33.33%	3	6.67%
25-36 hour	6	0	0.00%	3	50.00%	3	50.00%
37-48 hour	6	0	0.00%	3	50.00%	3	50.00%

The cure rate was high (90%) among those who were operated on within 2-6 hours and was low for those who were operated on within 37-48 hours. Morbidity was low (10%) for those who were operated on earlier and high (50%) for those who operated within 37-48 hours. Mortality was also high (50%) for this group of patient. It was observed that all 9 mortality cases were among patients who were operated on after the 12-hour mark.

Discussion

The goal of the current study was to examine the most frequent post-operative complication and the surgical results in 150 patients with abdominal gut damage. Young people made up a large portion of the study's participants. The bulk of participants, it was noted, were

younger than 30. The high incidence of young adults in the research group may be related to the younger generation's more active lifestyles, which put them at an increased risk of environmental injuries. Several more investigations confirmed same results. [7],[8]

Male predominance was similarly high among the participants, with a 9:1 male to female ratio. Given that our society's conventions make it very difficult for women of any age to be active, this lends weight to the earlier idea that people who are more active in their everyday lives are more likely to suffer from gut injuries. This also agreed with a few other research' findings. [8]-[11] Regarding the kind of trauma, the current series revealed that 40% of participants had blunt

trauma and 60% had penetrating trauma, however this picture was different in western nations where blunt trauma was more common. [12],[13]

40 percent of penetrating trauma incidents involved stabbing, and 33.34 percent involved gunshots. A total of 73.34 percent of penetrating injuries were due to these two sources. Other reasons, such as assault with a sharp object, road traffic accidents, and domestic animal assaults, were extremely unusual. Road traffic accidents made up 50% of blunt trauma cases, assaults (blow/kick) made up 40%, and falls from height made up 10%. Other research' findings, which indicated that patients' blunt force gut injuries were more frequently caused by automobile accidents, confirmed these conclusions. [14],[15] However, overall, there were little parallels between these findings and western research, where gunshot wounds were a significantly more common source of penetrating injuries. [16]

Another western study revealed that stab wounds were more common as the source of penetrating wounds. [17] However, our study's findings concurred with those of major Western research in terms of the causes of blunt trauma injuries. [16],[17] The amount of time between the first injury and the start of therapy greatly affects the morbidity and death rates of these individuals. Within 7 to 12 hours after admission, 21 patients in this group were operated on. Within 13 to 24 hours after admission, 15 surgeries were completed, including 10 within the first six hours. Four instances had operations that took more than 36 hours to complete.

52 percent of patients had additional abdominal injuries, the majority of which were soft tissue injuries (42.30 percent), followed by fractures of the upper limbs (19.25 percent), pelvic fractures (11.53 percent), thoracic injuries (11.53 percent), and head injuries (11.53

percent) (3.84%). These results were very comparable to those of a research by Evered et al. [17] In contrast to Fitzgerald et al study [18] 's where associated injury-related death was 22%, in this series morbidity was 50% and mortality was 11.53 percent for patients with the associated extra-abdominal injury. For both the penetrating and blunt groups, the patients' detailed clinical presentations and outcomes were examined. For a penetrating group, pain was the most frequent manner of presentation (93.3 percent).

In the blunt group, abdominal distension occurred 60% more frequently than in the penetrating group (30%). Major clinical signs included tenderness in 56.6% of penetrating patients and 70.6% of blunt patients, rigidity in 50% of penetrating patients and 70.6% of blunt patients, hypotension in 46.60% of penetrating patients and 60% of blunt patients, and anemia in 33.30% of penetrating patients and 40% of blunt patients. Absence of bowel sound in the penetrating group was 33.30 percent, and in the blunt group, it was 45 percent, indicating paralytic ileus. In this research, morbidity was 38.09 percent and death was nonexistent, however 42 percent of individuals underwent surgery within 7 to 12 hours.

Surgery was performed on 30% of patients within 13 to 24 hours, with morbidity at 33.3% and death at 6.6%. 20% of patients underwent surgery within 6 hours of admission, with a morbidity rate of 10% and a fatality rate of 0%. 4% of patients received final therapy within 25–36 hours, with a morbidity rate of 50% and a mortality rate of 50%. 04% of patients underwent surgery within 37-48 hours, with a 50% morbidity & fatality rate. As a result, it is clear from the study that delaying the initiation of final therapy had an impact on morbidity and death. According to Robbs et al.,

mortality was 47.2 percent in patients who underwent surgery after 24 hours, which was nearly identical to our research. [19]

Limitations of the Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

Conclusion

Among post-operative complications, wound infection and urinary tract infection were the most common presentations. The study observed 6% mortality, all of whom were operated more than 12 hours after their initial injury.

Ethical Approval: The study was approved by the Institutional Ethics Committee

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