



Surgery

A CLINICAL STUDY OF INTESTINAL INJURIES FOLLOWING ABDOMINAL TRAUMA

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ABSTRACT **BACKGROUND:** Intestinal injuries are found to be quite common following blunt or penetrating trauma. **AIM:** The present study is designed to determine the incidence of intestinal injuries following abdominal trauma in relation to age, sex, mode of injuries, common presenting features, and different management modalities and to assess the morbidity and mortality associated with intestinal injuries. **METHODS:** All the adult patients with intestinal injuries attending the hospital over a period of one year were included in the study. Injuries to other abdominal viscera and isolated injuries of rectum and anal canal were excluded from the study. After an initial survey and resuscitation at the emergency department and meticulous record of data, all the patients were managed accordingly. **CONCLUSION:** Intestinal injuries, most common after penetrating abdominal trauma have varied presentation often associated with injuries to other organs. Rapid assessment and resuscitation along with prompt surgical intervention can result in decreased morbidity and mortality.

KEYWORDS : Intestinal Injuries, Abdominal, Trauma**INTRODUCTION**

Trauma is a major public health problem faced by countries worldwide. It is a leading cause of death for all individuals below 45 years of age. Approximately one third of all trauma patients have abdominal injuries.¹ Intestinal injuries are a common occurrence following both blunt or penetrating abdominal trauma, resulting in increased morbidity and mortality.

AIMS AND OBJECTIVES

The present study done in Assam Medical College, aims to determine the incidence of intestinal injuries following different types of abdominal trauma in relation to age, sex, mode of injuries, common presenting features, management modalities and associated complications.

MATERIALS AND METHODS

During the study period of one year, all the adult patients with confirmed intestinal injuries coming to the emergency department were included in the present study. Most of these cases were included on the basis of findings on laparotomy. However children under 11 years of age were not included in the study. The patients with injuries to other abdominal viscera without any intestinal injury were excluded from the study.

An initial rapid assessment was carried out in all the patients to rule out life threatening injuries. A patent airway was ensured and any active external bleeding was controlled. A detailed history including the presenting complaints, the mode and time of injury was recorded. A thorough clinical examination was done to detect all the possible sites of injuries.

An intravenous line was started, blood transfusion administered as and when necessary. Nasogastric intubation and catheterization of bladder was carried out. Antibiotics and analgesics started and first aid given for associated injuries. Investigations carried out according to the general condition of the patients. Special investigations like imaging studies, Diagnostic Peritoneal Lavage, abdominal paracentesis was done only in the absence of definitive indication for surgical exploration. Haemodynamically unstable patients after initial resuscitation were shifted to the operation theatre. All the patients underwent exploratory laparotomy under general anaesthesia. Intestinal injuries were diagnosed intraoperatively in these cases.

RESULTS AND OBSERVATIONS

The present study comprises of 41 cases of intestinal injuries with or without injuries to other associated organs.

1. Incidence of Intestinal Injuries

Out of total of 224 cases of abdominal trauma, 41 cases (18.3%) were found to have intestinal injuries.

2. Age and Sex incidence**Table 1: Age and Sex distribution of intestinal injuries**

Age (in years)	Sex		Total no of patients (%)
	Male	Female	
11-19	6	0	6 (14.6%)
20-29	15	4	19 (46.3%)
30-39	10	2	12 (29.3%)
40-49	2	0	2 (4.9%)
50 and above	2	0	2 (4.9%)
	Total Males 35 (85.4%)	Total Females 6 (14.6%)	

Out of the 41 cases, 19 patients (46.3%) were of 20-29 years age group, followed by 12 patients in 30-39 years. Incidence was found to be more among males (85.4%).

3. Mode of Injury**Table 2: Different modes of injury causing intestinal injuries**

Mode of injury	No of cases (%)
PENETRATING TRAUMA	23 (56.1%)
Stab injuries	15 (36.5%)
Firearm injuries	3 (7.3%)
Arrow injuries	2 (4.9%)
Fall over sharp objects	2 (4.9%)
Goared by Animal	1 (2.4%)
BLUNT TRAUMA	18 (43.9%)
Road traffic Accidents (RTA)	8 (19.5%)
Fall from Height	5 (12.2%)
Physical Assault	3 (7.3%)
Sports injury	2 (4.9%)

23 cases (56.1%) of intestinal injuries were a result of penetrating trauma and 18 cases (43.9%) from blunt trauma. Stabbing was found to be the commonest cause of penetrating trauma, while road traffic accidents were common in blunt trauma. (Table-2).

4. Presenting features

Pain abdomen was the commonest presenting symptom. Distention of the abdomen seen in 28 cases (68.3%) in the present study. Evisceration of bowel was seen in 7 cases. 53.6% of the patients presented with shock. Tenderness and muscle rigidity elicited in 87.8% of patients. Other signs observed were obliteration of liver dullness, sluggish or absent bowel sounds.

5. Associated Injuries**Table 3: Distribution of associated injuries with intestinal injuries**

Site of associated injuries	Total no of cases (%)
Extremities	5 (12.2%)
Chest	4 (9.7%)
Head	3 (7.3%)
Stomach	2 (4.9%)
Liver	1 (2.4%)
Spleen	1 (2.4%)
Pancreas	1 (2.4%)

Of the commonly associated extremity injuries, fracture femur seen in 2 cases, fracture tibia in 1, Colles fracture in 1 and a deep cut injury of thigh in 1 case. Of the 4 chest injury cases, 3 had haemothorax and managed by intercostal water sealed drainage, 1 had diaphragm injury and managed at laparotomy. The other abdominal injuries were managed during laparotomy.

6. Anatomical Site of Intestinal injuries

Table 4: Anatomical site of injury in the intestines (findings at laparotomy)

Anatomical Site of injury	Total no of cases (%)	Penetrating trauma	Blunt trauma
Duodenum	1 (2.4%)	1	0
Jejunum and mesentery	15 (36.6%)	6	9
Ileum and mesentery	13 (31.7%)	10	3
Transverse colon	9 (21.9%)	5	4
Ascending colon	1 (2.4%)	1	0
Descending colon	2 (4.9%)	1	0

The small bowel was found to be the most commonly affected viscera, jejunum (36.6%) and ileum (31.7%) following both penetrating and blunt trauma. Colon injuries were seen in 12 cases. Only 1 case had injury to the duodenum.

7. Complications

Table 5: Incidence of complications in intestinal injuries

Complications	No of cases (%)
Wound infections	5 (12.2%)
Fistula	3 (7.3%)
Respiratory infections	3 (7.3%)
Wound dehiscence	2 (4.9%)
Intra abdominal abscess	2 (4.9%)
Total	15 (36.6%)

Of the complications observed in 15 cases, wound infections (12.2%) was the commonest. Wound dehiscence seen in 2 cases, fistula in 3 and intra abdominal abscess in 2. Chest infection seen in 3 (7.3%) cases.

8. Mortality

4 cases (mortality 9.7%) expired out of the total 41 cases; 3 case following blunt trauma and 1 following penetrating trauma

DISCUSSION

In the present study period of one year, 41 cases of intestinal injuries were observed among a total of 224 cases of abdominal trauma (18.3%). This is similar to the findings of Arumugam et al², Costa et al¹.

Intestinal injuries were found to be most common in adult males (85.4%) in 20-29 years age group (46.3%). Lone et al¹ has reported male female ratio of 4.4:1. Baradaron et al has found 20-30 years males as the most common victims⁵. Gad et al reports 87.1% males in their study⁶. All these findings are consistent with the present study.

Penetrating trauma was responsible for the majority of intestinal injuries. Stabbing was the most common cause (36.5%) which is similar to the findings of Gad et al⁶. However some studies have reported firearm injuries as the commonest mode (Lone et al¹, Baradona et al⁵). This difference may be due to the variation in availability of weapons in different areas of study. Road traffic accidents (RTA) were the commonest cause in blunt trauma group (19.5%). Karamercan et al⁷ and Gad et al⁶ have reported even higher incidence of RTA. This can be explained by the increase in vehicular traffic in cities.

Pain abdomen was the common presenting feature in all the 41 cases of intestinal injuries which is similar to past studies (davis JJ et al⁸, Panchal H et al⁹). Other common findings like distension of abdomen, tenderness, muscle guarding, obliteration of liver dullness, sluggish or absent peristalsis are consistent with Panchal et al⁹, Maingot¹⁰.

Gad et al has reported extremity injuries as the most common associated injury⁶ which is corroborative with the findings in our study (extremity injuries—12.2%). Arumugam et al² and Mohammed et al¹¹ reports chest injury to be more common which is probably due to their focus on blunt trauma cases only.

Exploratory laparotomy was performed on all the 41 cases. Various studies have reported small bowel to be the most frequently injured organ in intestinal injuries (Munns et al¹², EA Ameh et al¹³, Dauterive et al¹⁴, Grosfeld et al¹⁵). In the present study, small intestine was involved in 12.9% of abdominal trauma cases and colon in 5.3%, which is similar to Costa et al who has reported 10% and 6%³ and Arumugam et al with 12% and 5%² respectively.

The duodenal injury was present in the second part and was repaired in two layers, and is recommended when ampullary region is not involved¹⁶. Majority of the small tears in jejunum and ileum was repaired primarily. Resection and anastomosis was done in 5 cases of small bowel injuries due to presence of lacerations in 2 and multiple perforations in 3. One case of ascending colon injury was treated by ileo-transverse anastomosis and colostomy was done in the two cases of descending colon injury. Primary repair was done only in 4 cases, and resection and end to end anastomosis done in the other 5 cases. Similar procedures has been advocated by various studies^{18,19,20}.

Various studies have reported sepsis as the most common complication following intestinal injuries (Osborn et al²¹, Arumugam et al). Wound infection was seen in 12.5% of the cases, which is comparatively higher and may be explained by the increased numbers of laparotomy in the present study.

Our study has observed mortality rate of 9.7%. This is less compared to earlier studies of Gad et al⁶ (25.8%), Musau et al²² (12.5%), which may be explained by the limited number of cases in the present study.

SUMMARY AND CONCLUSION

Intestinal injuries are quite common after both penetrating and blunt abdominal trauma. Young adult males are the usual victims. Penetrating trauma, especially stabbing was found to commonly cause intestinal injuries whereas blunt trauma mainly road traffic accidents is also an important cause in modern days. Most of the patients presented with pain and distention of the abdomen with sluggish or absent peristaltic sounds and hemodynamic instability. Extremity injuries was a common associated problem. Exploratory laparotomy was done in all cases which is diagnostic as well as therapeutic. Small bowel was found to be the commonest organ involved. During the postoperative period, quite a few patients had wound infections; while only a small group had major complications like wound dehiscence, intra abdominal abscess, fistula formation. However, mortality was limited to only 4 cases. Thus, morbidity and mortality associated with intestinal injuries is acceptable with early exploratory laparotomy.

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