

A Retrospective Study of Penetrating Abdominal Trauma at Tertiary Care Hospital, Rims Ranchi

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Abstract: Penetrating trauma of the abdomen continues to be one of major cause of trauma admission. It involves the violation of the abdominal cavity by a gun-shot wound or stab wound. In view of increasing number of penetrating abdominal injuries, this study has been chosen with reference to the patients presenting at Rajendra Institute of medical sciences, Ranchi between August 2018 to February 2019, with penetrating injury to abdomen. This was a prospective study of 30 cases. A detailed analysis of clinical presentation, imaging reports, provisional diagnosis, management and any complications was documented. Patient in the age group of 20-40 years were most commonly affected. Male:female ratio was 6.5:1. Small bowel injuries were the maximum (23.5%). 76.66% underwent surgical intervention. 23.33% of patients were stable and there was no evidence of ongoing blood loss, no evidence of gastro-intestinal or genito-urinary injuries were managed by non-operative management.

Keywords: Penetrating abdominal trauma, surgical intervention, non-operative management

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I. Introduction

Penetrating abdominal trauma is seen in many countries and one of the most common emergencies encountered by a General Surgeon. Trauma, accidental or deliberate, is the most common cause of mortality in adults <40 years of age.¹ Abdomen is third in the list of most commonly injured regions in trauma.² Abdominal trauma can be either blunt or penetrating. There are various modes of penetrating abdominal trauma such as stab injury, gunshot wounds, animal gore injury and road traffic accidents (RTA). Traditionally most cases of penetrating abdominal trauma were managed by emergency exploratory laparotomy, but recent trends have changed towards conservative management of a subset of carefully selected patients of penetrating trauma who are hemodynamically stable, thereby avoiding unnecessary emergency laparotomies in this predominantly young patient group and the concomitant morbidities associated with surgical intervention.³ The most common cause is a stab. The most common organs injured are the small bowel (50%), large bowel (40%), liver (30%), and intra-abdominal vascular (25%). When the injury is close range, there is more kinetic energy than those injuries sustained from a distance. Even though most gunshot wounds typically have a linear projection, the high-energy wounds are associated with unpredictable injuries. Stab wounds that penetrate the abdominal wall are difficult to assess. Occult injuries can be missed, resulting in delayed complications that can add to the morbidity. The principles of management of such cases is changing since the last century from conservative to aggressive approach and then now finally to selective non-operative approach. Recent trend is selective management of patients with penetrating injury by watchful monitoring and conservative management. However, one of the major reasons for the reluctance of the surgical community to adopt a selective non-operative approach in patients with penetrating solid organ injuries is the concern of missing other significant intra-abdominal injuries, especially hollow viscus perforations. Armenakas et al,⁴ in a review of 200 stab wounds to the kidneys, reported that in 39% of the cases, the injuries did not involve any other intra-abdominal organ. In another study, 34% of 152 patients with gunshot wounds to the liver had no other significant intra-abdominal injuries.⁵ The early identification of patients with associated intra-abdominal injuries or significant bleeding is the cornerstone of selective non-operative management. Careful initial and subsequent serial clinical examinations are very reliable and safe in the evaluation of both stab wounds and gunshot wounds to the abdomen.⁶ Patients who are clinically unevaluable (i.e. severe head trauma, spinal cord injury, need for other extra-abdominal operations) should not be considered for non-operative management.

Aims

The study was conducted with following aims:

- To know about age and sex distribution of penetrating injury.
- To understand clinical presentation and most common cause of penetrating injury.
- To find most common organ affected in penetrating injury
- Role of conservative and surgical management.

II. Materials and Methods

This was a prospective study conducted at Rajendra Institute of Medical Sciences, Ranchi from August 2018 to February 2019 on patients who presented with penetrating injury to abdomen. A detailed analysis of clinical presentation, imaging reports, provisional diagnosis, management and any complications was documented. After approval from Institutional Ethics Committee of Rajendra institute of Medical Sciences, Ranchi, Jharkhand, India, 30 patients of penetrating abdominal trauma were included in the study. Informed written consent was obtained from the patients.

Inclusion criteria:

1. All patients, who have penetrating abdominal or combined injury and hospitalized for the same.
2. Penetrating abdominal injury should have peritoneal breach.

Exclusion criteria:

1. All patients who have penetrating abdominal injury and not hospitalized for the same.
2. Patient having penetrating injury but no peritoneal breach
3. All deaths on arrival Cases who were so severely injured that they did not survive attempts at resuscitation in emergency department.
4. Patients who have taken discharged against medical advice and lost to follow ups.

All patients were admitted and primarily resuscitated according to ATLS guidelines. Following stabilization of vitals, base line blood investigations were done, which included a complete blood picture, random blood sugar, renal function tests (RFT), serum electrolytes, liver function tests, prothrombin time and INR. A chest radiograph, erect abdominal radiograph and an ultrasound (USG) abdomen were done on admission. Based on the nature of injuries, hemodynamic stability, response to initial resuscitation, the cases are decided whether to be managed conservatively or go for immediate laparotomy. Patients undergoing non-surgical management were then closely monitored hourly for first 24 hours, including vitals and clinical examination of the abdomen for signs of peritonitis. After the first 24 hours, monitoring was done every 6 hours for the next two days and then daily until discharge. Patients undergoing surgical intervention were managed according to standard protocol and followed up. The detailed examination, clinical features, imaging features, injuries, intra-operative findings and corrective and curative surgical procedures done were all properly documented.

III. Results

Table 1: Age

Age group (years)	No. of cases
<20	4
20-40	16
40-60	7
>60	3

Table 2: Sex

Sex	No. of cases
Male	26
Female	4

Table 3: Mode of penetrating injury

Mode of penetrating Trauma	No. of cases
Stab injury	18
Bull gore injury	2
Road traffic accident	4
Gunshot injuries	6

Table 4: Time of presentation

Time of presentation (hours)	No. of cases
0-6	5
6-12	10
12-24	8
24-48	5
>48	2

Table 5: Clinical features

Clinical features	No. of patients (%)
Hemodynamic instability at presentation	20 (66%)
Peritoneal penetration	23 (76.6%)
Generalized tenderness	26 (86.6%)
Omental evisceration	12 (40%)

Table 6: Management strategy

	No. of cases
Non-operative management	7
Laparotomy	23

Table 7: Intraoperative findings

Organs injured	Percentage
Small bowel perforation	23.5%
Large bowel perforation	14.7%
Stomach perforation	11.7%
Splenic laceration	5.8%
Liver laceration	17.6%
Mesenteric tear	11.7%
Gallbladder	2.9%
Bladder	2.9%
Diaphragm	8.8%

Table 8: Surgical procedures

Surgical procedures	Percentage
Drainage of hemoperitoneum and hemostasis	8.8%
Primary repair of gut / resection and anastomosis	32.5%
Stoma (Ileostomy or colostomy)	17.6%
Splenectomy	2.9%
Liver repair	11.7%
Diaphragm repair	8.8%
Urinary bladder repair	2.9%
Cholecystectomy	2.9%
Bladder repair	2.9%
Mesenteric repair	11.7%

Table 6: Complications

Complications	No. of cases
Wound related complications (SSI)	8
Fecal fistula and other intraabdominal complications	2
Death	1

IV. Discussion

This study includes 30 patients of penetrating abdominal trauma of which 26 (86.6%) were males and 4 (13.4%) were females. Male:female ratio was 6.5:1. Most studies show a higher incidence of penetrating abdominal trauma in males. Torres and Gonzalez in a study of 89 patients reported an incidence of 79.8% in males and 20.2% in females which almost is similar to our study. The most common age group was 20–40 years in our study. According to a study by Shaftan et al, there was a 92% incidence of stab injury in penetrating trauma. Our study showed 60 % stab injury.

50% of the patients presented within first 12 hours of trauma. About 50% of stab wounds to the anterior abdomen and about 85% of stab wounds to the posterior abdomen can safely be managed non-operatively.⁷ Even in the presence of peritoneal violation, a significant number of patients have no major intra-abdominal injury requiring operation. In a prospective study of 476 patients with stab wounds and proven peritoneal penetration, 27.6% had no significant intra-abdominal injury.⁸

The management of gunshot injuries to the abdomen has remained unchanged for many decades, with mandatory laparotomy being the standard practice. However, this concept has been challenged and some centres

with extensive experience with penetrating injuries practice a selective non-operative management.⁹

Approximately 30% of abdominal gunshot wounds to the anterior abdomen and about 67% of gunshot wounds to the back can safely be managed nonoperatively.¹⁰ Clinical assessment plays a very important role in the initial assessment of the patient and to decide the modality of treatment. Physical examination is extremely reliable in deciding the need for laparotomy.¹¹ clinical examination had a sensitivity of 100% and specificity of 95%.¹²

Exploration of wound locally is very helpful in ascertaining the severity of injury. If peritoneum is not breached, and other parameters are satisfactory, patient can be safely discharged from emergency department.¹³ Not all stab injuries breaches the peritoneum and not all those stab injuries that breaches the peritoneum do any intraperitoneal damage. Hence judicious clinical judgment is very much required in such cases to decide about the timing and necessity of laparotomy.¹⁴ Diagnostic peritoneal lavage (DPL) as a diagnostic tool was increasingly being developed in many centres treating penetrating trauma abdomen.¹⁵ In our centre we prefer FAST and in selected cases CECT is used to come to a diagnosis about the nature and severity of an injury. Ultrasound is very useful as a diagnostic tool in detecting hemoperitoneum.¹⁶

Twenty three patients (76.6%) underwent laparotomy. Among other patients, the most common organ injured was hollow viscus perforation (49.9%), mainly small bowel (23.5%). Detection of peritoneal breach during local wound exploration was a good predictor for detecting injuries during laparotomy. Most common complication was wound dehiscence.

Renal injuries are theoretically more amenable to non-operative management than other intra-abdominal solid organ injuries. The retroperitoneal position of the kidneys may contain bleeding, and the rich blood supply may promote healing even after severe parenchymal injuries. The success rate of non-operative management of blunt renal trauma not involving the renal vessels has been reported as high as 95%.¹⁷ There is very little published work on the safety and feasibility of the non-operative management in penetrating splenic injuries. Pachter et al¹⁸ in 1998 reported 6 cases with stab wounds to the spleen managed non-operatively.

V. Conclusion

Cases of penetrating abdominal trauma, mainly due to stab injury in young males, are a common emergency where small bowel is the most common organ involved. Careful initial examination complemented by other investigation can be used to select the patients who can be managed conservatively. Conservative management in a group of carefully selected patients with penetrating abdominal trauma is an established standard of care, which minimizes surgical morbidity and improves the quality of life. But explorative laparotomy is the best method of treatment in diagnosed and borderline cases of penetrating abdominal trauma.

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