

A Retrospective Study on Penetrating Injuries Abdomen

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Received: 27-01-2023 / Revised: 21-02-2023 / Accepted: 10-03-2023

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Conflict of interest: Nil

Abstract

Background: Penetrating injuries of abdomen are a major component of surgical emergencies. As it remains one of the commonest reasons for preventable deaths in any trauma systems. Objective: The present study was done with the objective to identify the factors that reduce morbidity, to formulate a better protocol in management and to find efficacy of CT in identifying peritoneal breach and visceral injuries.

Methods: A series of 40 patients admitted with penetrating abdominal injuries over the period of 1.5 years (January 2021 to August 2022) in JMCH, Jhalawar, Rajasthan, India were enrolled in this study.

Results: The most common age group affected was 31-40 years and male to female ratio was 7:1. The most common cause was found to be assault (80%). Out of 40 patients, 20 patients (50%) were immediately planned for early laparotomy the remaining 20 patients (50%) were stable and were subjected for CT abdomen with contrast. Out of those 20 patients, 18 patients (45%) were showing evidence of peritoneal penetration. Overall 8 patients (20%) were managed conservatively and 32 patients (80%) underwent laparotomy.

Conclusion: Young males were predominantly involved. The commonest mode of penetrating injury is by stab wounds to abdomen. Patients with haemodynamic instability were taken for early laparotomy. CT is highly sensitive in predicting both peritoneal penetration and intra-abdominal visceral injuries.

Keywords: Peritoneal Penetration, Intra-Abdominal Visceral Injuries, CT Abdomen With Contrast.

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Introduction

Penetrating abdominal injuries remains one of the commonest reasons for preventable deaths in any trauma systems [1]. These injuries are a major and important component of surgical emergencies. Penetrating abdominal injuries were managed expectantly until late 19th century, however through the advances in the modern medicine over the

past century there has been great improvement in the management of such injuries as well. Major improvements in the field of blood transfusion and liberal use of antibiotics lead to the increase in explorative laparotomy. There are various types of abdominal injuries that includes parietal, visceral and perforating through and through injuries. Unnecessary

exploration leads to increased morbidity. The goal in managing penetrating abdominal injuries is to identify and treat all the damages caused by the weapon and to reduce negative laparotomy and avoid missed injuries.

Method

This is a retrospective study that was carried out in Government Hospital of Jhalawar Medical College, Jhalawar from January 2021 to August 2022. From the hospital database 40 cases admitted with abdominal penetrating injury were included in this study. The patient charts were reviewed for demographic data, type of injury, symptoms and signs at presentation, methods of diagnostic investigations, treatment adopted and

complications encountered. Those patients who were stable at the time of presentation were selected and subjected to CT scan. Intra-abdominal CT was performed within 2 hours after initial assessment and resuscitation. The CT scans were reviewed by radiologists. Radiographic signs considered as positive were pneumoperitoneum, hemoperitoneum, wound track extending through the peritoneum, and signs of bowel injury were: wound track extending to bowel wall, bowel wall defect, bowel wall thickening, extravasation of oral or rectal contrast, and focal hematomas.

Results

Age Group Affected

Table 1: Incidence of penetrating abdominal trauma in various age groups:

Age	No. f Cases	% Of Study Population
0-10	01	2.5%
11-20	03	7.5%
21-30	14	35%
31-40	18	45%
41-50	04	10%
>50	00	0%

Nearly 80% of cases were in the age group of 21 to 40 years.

Table 2: Sex Incidence

Male	35	87.50%
Female	05	12.50%

Of the 40 cases 35 were males and 5 were females.

Table 3: Cause of Penetrating Abdominal Injury

Cause	No. of Patient	Percentage
Accident	08	20%
Assault	32	80%

Table 4: Indication for Early Laparotomy in Penetrating Abdominal Injury

Indication	No. of Patients	Percentage
Generalised Tenderness, guarding and rigidity	10	25%
Evisceration	02	5%
Haemodynamic instability	08	20%
Total	20	50%

Out of 40 patients, 20 patients were immediately planned for early mandatory laparotomy. All these patients presented with either one of these findings: generalised peritonitis, or evisceration or hemodynamic instability. They were not subjected to other forms of investigations like CT abdomen. Exploratory laparotomy was done.

Table 5: Peritoneal Penetration Identification by Ct Scan

Peritoneal Penetration	No. of Patients	Percentage
Present	18	90%
Absent	02	10%
Total	20	100%

The remaining 20 patients were stable and were not showing any signs for immediate mandatory laparotomy. They were subjected for CT abdomen with contrast study to identify peritoneal breach and other internal organ injuries.

Out of 20 patients, 18 patients were showing evidence of peritoneal penetration in the form of free air in the peritoneum with or without positive CT findings of visceral injuries.

Table 6: Identification of Injuries by Ct Scan

Injuries Identified by CT scan	No. of Patients	Percentage
Hollow viscus injury	10	55.55%
Solid organ injury	04	22.22%
Combined	02	11.11%
Minimal Hemoperitonium/mesenteric hematoma	01	5.55%
Negative CT	01	5.55%
Total	18	100%

Table 7: Ratio of Operative to Conservative Treatment

Treatment	No. of Patients		Percentage	
Operated	Early Laparotomy	32	80%	
	Laparotomy after CT	20		
	CT Negative	12		
Conservative	No Peritoneal Breach	08	20%	
	No Injuries detected			02
	Minor Injuries			01
Total	40			

Table 8: Role of Laparotomy in Operated Patients

Laparotomy	No. of Patients	Percentage
Therapeutic	32	80%
Non Therapeutic	00	
Negative	00	
Total	32	

Table 9: Conservative Management

Conservative	No. Of Patients	Percentage
No peritoneal penetration	02	5%
No visceral injury	02	5%
Visceral injury	04	10%
Total	08	20%

Discussion

Amongst the 20 patients who underwent CT following the abdominal penetrating injury 18 were found to have peritoneal breach, i.e. 90%.

Table 10: Of the 32 patients who underwent laparotomy

CT Finding of peritoneal breach		Laparotomy confirms breach	Conservative Management	Total
	Present	12	06	18
Absent	00	02	02	
Early Laparotomy	20	00	20	
Total	32	08	40	
CT Findings Intra-abdominal injuries		Laparotomy	Conservative Management	Total
Present	12	06	18	
Absent	00	02	02	
Total	12	08	20	

Of the 20 patients with penetrating abdominal injuries, 2 had no peritoneal breach. Out of the remaining 18, 17 patients were showing evidence of intraperitoneal visceral injuries and 1 patients with no visceral injuries in CT. [2-6]

Morbidity following penetrating injuries to abdomen depends on various factors including patients age, number of unit of blood transfused, the organ injured, severity of injuries sustained, multiple intra-abdominal injuries and associated extra abdominal injuries, co morbid illnesses, type of treatment adopted, delayed intervention and peritoneal contamination, choice of antibiotics, duration of antibiotic administration and wound

management. [7-9]

Early diagnosis and surgical treatment is important in reducing the peritoneal contamination and thereby reduces the morbidity and mortality. Majority of patients were presented to hospital immediately after stab injuries, complications were relatively less. The ultimate goal in managing penetrating abdominal trauma is not only the early identification of injuries and appropriate treatment, but also to avoid unnecessary laparotomies. To accomplish this, patients are to be correctly selected and subjected to CT scan of the abdomen, which

accurately identifies the need for further laparotomy. [10] Considering the benefits of avoiding unnecessary hospital stay, manpower loss, and also the accuracy of CT scan in identifying peritoneal breach and visceral injuries, such investigation is to be offered as a first line of investigation in stable patients. [11]

Conclusion

Following this retrospective study of 40 cases of penetrating abdominal trauma the following conclusions can be made:

1. Young males were predominantly involved between the age group of 20 to 40 yrs.
2. The commonest mode of penetrating injury is by stab wounds to abdomen.
3. Careful and repeated clinical examination and appropriate diagnostic investigations leads to successful treatment in these patients.
4. Those patients with haemodynamic instability, generalised peritonitis, evisceration of omentum and bowel, and hemorrhage are the potential candidates for early mandatory laparotomy.
5. Computed tomography is highly sensitive in predicting both peritoneal penetration and intra-abdominal visceral injuries.

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