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AN OBSERVATIONAL STUDYOF PENETRATING ABDOMINAL TRAUMA AT RIMS RANCHI

General Surgery

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ABSTRACT

Penetrating abdominal trauma is one of the commonest surgical admissions in the emergency department. There are various modes of penetrating abdominal trauma such as stab injury, gunshot wounds, animal gore injury and road traffic accidents (RTA). The most common cause is a stab. This was a retrospective study involving 68 patients of penetrating trauma abdomen admitted in Surgical Emergency, Rajendra Institute Of Medical Sciences, Ranchi from January 2019 to December 2019. After the detailed enlistment of the clinical and radiological picture, everything was documented and results were analysed. Males of young and middle age group were affected the most with small bowel as the commonest organ injured. Approximately 88% of patients underwent exploration, while around 12% were managed conservatively and discharged accordingly. Surgical Site Infection was the commonest complication post surgery, while the mortality rate was 9% in this study, among the operated cases.

KEYWORDS

Penetrating Abdominal Trauma, Stab, Gun-shot, Small Bowel Injury, Exploratory Laparotomy

INTRODUCTION

Trauma is one of the major cause of morbidity and mortality. Injury continues to be the leading cause of death in the first four decades of life. Major trauma does not respect and restrict itself to one organ or one system[1]. The abdomen is the third most common injured region, with surgery required in about 25% of civilian cases[2]. Evaluation of a patient with abdominal trauma can be a most challenging task that a surgeon may be called on to deal with[1] . Abdominal trauma is traditionally classified as either blunt or penetrating. Penetrating abdominal trauma can usually be diagnosed easily and reliably, whereas blunt abdominal trauma is often missed because clinical signs are less obvious[2].There are various modes of penetrating abdominal trauma such as stab injury, gunshot wounds, animal gore injury and road traffic accidents (RTA). 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. There may also be secondary missile injuries from bone or bullet fragments. 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[3]. 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 nonoperative approach in patients with penetrating solid organ injuries is the concern of missing other significant intra-abdominal injuries, especially hollow viscus perforations. The early identification of patients with associated intra-abdominal injuries or significant bleeding is the cornerstone of selective non-operative management. Multiorgan injuries, exsanguinating hemorrhages delayed presentations, and the ominous reputation for high mortality and morbidity are just few of the many reasons which make this topic of penetrating injuries a fascinating one[1].

AIM AND OBJECTIVES:

This study has been conducted with the aim to evaluate different factors associated with penetrating abdominal injuries, with the following objectives:

1. To know the demographic profile
2. To understand the clinical presentation and evaluate the causes of the injury
3. To know the series of the organ involved
4. To know the management protocol, viz, conservative or surgical.

MATERIALAND METHODS

This is a retrospective study conducted at Rajendra Institute of Medical Sciences, Ranchi from January 2019 to December 2019 on patients who presented with penetrating injury to abdomen in Surgical Emergency. 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, 68 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 with or without peritoneal breach.

Exclusion criteria:

1. All patients who have penetrating abdominal injury and not hospitalized for the same.
2. All deaths on arrival cases who were so severely injured that they did not survive attempts at resuscitation in emergency department.
3. Patients who have taken discharged against medical advice and lost to follow ups.
4. Patients below 12 yrs of age(pediatric age group).

All patients are admitted and primarily resuscitated according to ATLS guidelines. Patients with shock are given initial resuscitation with Haemaccel I.V. fluids. Following stabilization of vitals, base line blood investigations are 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 are done, if time permits. Radiograph of the abdomen is questionable in the case of stab wounds and contributes a little to the evaluation of stab wounds to the abdomen. In a study by Kester et al., Radiograph of abdomen were abnormal only in 8 % of cases[4]. 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 conservative 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.

RESULT

TABLE NO. 1: AGE

AGE GROUP (In Years)	No. Of Cases	Percentage
< 20	3	4.0
20 – 40	43	63
40 -60	12	18
> 60	10	15
Total	68	100

TABLE NO.2 : SEX

SEX	No. Of Cases	Percentage
Male	63	93
Female	5	7.0
Total	68	100

TABLE NO. 3 : MODE OF INJURY

Mode Of Injury	No. Of Cases	Percentage
Stab Injury	52	76.5
Bullet Injury	9	13
Arrow Injury	2	3
Road Traffic Accident	3	4.5
Fall From Height	2	3
Total	68	100

TABLE NO. 4 : TIME OF PRESENTATION

Time Of Presentation	No. Of Cases	Percentage
< 6 hours	12	18
6 - 12 hours	34	50
12- 24 hours	16	23
24- 48 hours	2	3
> 48 hours	4	6
Total	68	100

TABLE NO. 5 : MANAGEMENT

Management	No. Of Cases	Percentage
S-NOM	8	12
Operative Management	60	88
Total	68	100

TABLE NO. 6: OPERATIVE FINDINGS

Organs Injured	No. Of Exploratory Findings	Percentage
Small Bowel Injury	34	31
Large Bowel Injury	22	20
Stomach	6	6
Liver	11	10
Spleen	4	4
Kidney	4	4
Diaphragm	6	6
Retro-peritoneal Hematoma	8	7.0
Mesentery tear	13	12
Total	108	100

TABLE NO.7 : SURGICAL PROCEDURES

Surgical Procedures	No. Of Procedures	Percentage
Primary Repair of Bowel	26	24.0
Resection and Anastomosis	10	9.0
Stoma(Ileostomy/Colostomy)	26	24.0
Stomach Repair	6	6.0
Liver Repair	8	7.0
Splenectomy	3	3.0
Nephrectomy	3	3.0
Diaphragm Repair	6	6.0
Mesentery Repair	13	12.0
Drainage of Hemoperitoneum and Hemostasis	7	6.0
Total	108	100

TABLE NO.8: COMPLICATION

Complications	No. Of Cases	Percentage
Surgical Site Infections	11	46
Anastomotic leak	3	12
Stomal Complications	4	17
Death	6	25
Total	24	100

DISCUSSION

There were total of 68 cases of penetrating abdominal trauma during this study, of which, commonest age bracket involved was within the range of 20-40 years (around 63%). Most of the victims of penetrating abdominal trauma are the young- and middle-aged groups who are within the prime of their life[5]. Out of 68 cases, 63(93%) were males and 5(7%) were females. This offers a male-to- female ratio as 12.6 : 1. This high incidence of males within the trauma may probably flow from to relatively high involvement of male in the acts of violence. In a study of 6,388 patients, El Menyar et al reported the incidence of trauma in males as 93%[6]. In this study, Stab injury is the commonest mode of injury, accounting for 76%. Another common mode of injury was Gunshot Injury (13%), while less common were Arrow Injury, Road Traffic Accident and Fall from height. 50% of the cases presented to the emergency department within 6-12 hours of the onset of trauma, and also the resuscitation was started from that time of contact following the note of detail history including external injury details. In penetrating abdominal injuries , stab or gunshot, the organ most typically injured is the small bowel accounting 49 to 60 % of all injuries. In general, stab wounds are less damaging than gunshot wounds and lead to fewer complications. Studies by Moore et al. and Croce et al. have shown that the number of organs injured, the penetrating abdominal trauma index, and also the abdominal septic complications are significantly lower in stab injuries than with gunshot wounds[7,8]. Initial examination of the trauma victim plays a major role in the proper management of the patient both immediately in the emergency room and later in the surgical department. Out of 52 cases of stab injury, 6 patients failed to have peritoneal breach, so they were under close monitoring followed by ultrasound of abdomen and pelvis, which revealed mild hemoperitoneum in 2 cases and normal study with no solid or hollow viscus organ injury in 4 cases, and were then managed conservatively. One case of road traffic accident presented with a lacerated wound over abdomen and chest with tenderness over whole abdomen and guarding in addition with sluggish bowel sound; Chest x-ray was normal with no signs of rib fracture and hemothorax; peritoneal breach was seen with liver contusion and mild hemoperitoneum on ultrasound of abdomen , therefore the patient was kept on Wait and Watch policy and thereafter managed conservatively. Another case presented with a history of fall on a sharp object ,had no peritoneal breach but Right Both Bone(forearm) Fracture and was managed conservatively. So in total, 8 patients were managed conservatively, accounting for 12%. The guidelines published by Como et al. recommend that majority of such patients could also be discharged after 24 hours of observation with a reliable abdominal examination and minimal to no abdominal tenderness[9]. Peritoneal violation has been mentioned as the indication of laparotomy in 70 to 80 % of cases according to the reported series in the literature[7,8]. Visceral or omental evisceration in a hemodynamically stable patient without evidence of peritonitis is a relative instead of absolute indication for exploration.. Since there are opinions both for and against routine exploration[10,11],no policy has been recommended in this context. Therefore, at present, these patients are probably best served by laparotomy. The commonest injured organ encountered on exploratory laparatomy was Small Bowel (31%) followed by Colon (20%) and Liver (10%). Due to the involvement of multiple organs, management of penetrating injury is complex, both intra-operatively and post-operatively. Approximately 25% of patients requiring surgical treatment for bowel trauma have more than one bowel injury and likely more than one mechanism. The greater the number of organs injured, the more likely there is associated bowel and mesenteric injury[12]. Because the most common injury was at the level of small and large bowel and due to less peritoneal contamination, Primary repair of the perforation and Resection & Anastomosis was preferred followed by Stoma formation in cases with more peritoneal contamination and unhealthy bowel. The most common complication was wound related infection followed by anastomatic leak seen in 3 out of 10 cases of Resection& Anastomosis. In this study, 6 patients died due to various complications, accounting for 9 % mortality among the operated cases.

CONCLUSION

Penetrating abdominal trauma is the surgical emergency affecting mostly young and middle aged men, presenting within 24 hours. The most common mode of injury is Stab followed by Gunshot. Adequate measures were taken for resuscitation of the hemodynamically unstable patients, before undergoing surgical procedure. Majority of cases underwent exploratory laparotomy that depicted small bowel as the most common organ hollow viscus organ injured and Liver as the most common solid organ injured. Surgical Site Infection was seen as

the most common complication, with Mortality rate as 8.82%. According to the study done by Shaftan[13], it was concluded that "the application of trained surgical judgment rather than dogma is the more rational and intelligent approach to the management of abdominal injury."

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