International Surgery Journal
Bhandari V et al. Int Surg J. 2020 Mar;7(3):710-713
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20200808

Original Research Article

Comprehensive study of blunt injury abdomen in single center

Vinod Bhandari*, Mahak Bhandari

Department of General Surgery, Sri Aurobindo Medical college and P.G. Institute, Indore, Madhya Pradesh, India

Received: 26 December 2019
Revised: 30 January 2020
Accepted: 07 February 2020

***Correspondence:**
Dr. Vinod bhandari,
E-mail: vb21122@gmail.com

ABSTRACT

Background: Blunt injury abdomen is the leading cause of morbidity and mortality in all age groups. Blunt trauma differs from penetrating trauma as different organs are characteristically injured by compression from blunt straining. Focused assessment with sonography for trauma (FAST) and computed tomography (CT) abdomen are very beneficial to detect those patients with minimal and clinically undetectable signs of abdominal injury. Objective of the study was to evaluate the incidence of blunt injury abdomen, mode of injury, organs involved in patients.
Methods: A retrospective study was done on blunt injury abdomen. 48 patients were enrolled in this study.
Results: Out of 48, 35 (72.9%) male patients more commonly encountered blunt injury to the abdomen. 28 (58.3%) was the highest incidence for age group 21-40 years. The most common mode of injury was road traffic accidents 36 (75.0%). Grade III splenic injuries were encountered in majority 19 cases and 13 cases involved laceration of parenchyma >3 cm depth and 6 cases were subcapsular hematoma (>50%). Spleen was the most common injured organ accounting for 25 (52.0%) and second most common injury was Ileal perforation 6 (12.5%), liver injury 6 (12.5%) of the cases.
Conclusions: Blunt injury abdomen mainly affected male and the younger population between the age group 21-40 years. The most common mode of injury is road traffic accidents. In this study the spleen was found to be the most common organ injured in blunt injury abdomen.

Keywords: Blunt injury abdomen, Road traffic accidents, Spleen

INTRODUCTION

Blunt abdominal trauma is the most common example of all blunt trauma injury and represents 75% of this injury.[1] World over injury is the 7th cause of death rate and abdomen is the third most common injured organ. Abdominal injuries need surgery in about 25% of cases. 85% of abdominal traumas are of blunt character.[2] The majority of blunt injury abdomen cases are related to motor vehicle collision or automobile versus pedestrian accidents.[2] Blunt injury to the abdomen can also occur as a result of fall from height, assault with blunt objects, sports injuries, and bomb blasts.[3] Abdomen is the third most common organ injured following extremities and head injury. Computed tomography (CT) scanning has increased the identification of injuries.[4] Initial resuscitation along with focused assessment with sonography in trauma (FAST) and CT abdomen are very beneficial to detect those patients with minimal and clinically undetectable signs of abdominal injury.

Physical examination findings are sometimes unreliable for several reasons; including the presence of distracting injuries, associated chest injuries, an altered mental state, and co-existing drug and alcohol intoxication in the patient.[5] Unrecognized intra-abdominal injury remains distressingly frequent cause for preventable death in a patient with blunt injury abdomen.[6] The aim of the study

was to evaluate the incidence of blunt injury abdomen, mode of injury, organs involved in patients.

METHODS

Study design

This study was conducted in department of surgery, Sri Aurobindo Institute of Medical Sciences and PG Institute, Indore. The duration of this study was April 2017 to May 2019. A total of 48 patients enrolled in this study. Patients who sustained blunt abdominal trauma who were admitted and managed in hospital.

Sampling method

After initial resuscitation, physical examination, detailed clinical history, X-rays and laboratory tests, ultrasonography (FAST) was done to arrive at the diagnosis. CT scan was done in most of the case. Decision for operative or non-operative management depended on the outcome of the clinical examination, hemodynamic stability of the patient and the results of the investigations done. The improvement of patients was closely monitored, and decision was taken to either continue with conservative management or to undertake laparotomy. Appropriate investigations, such as the hemoglobin value, and ultrasound of the abdomen were repeated as and when necessary. Authors were also subjected to serial clinical examination pulse rate, blood pressure, respiratory rate. Sometimes, in cases of liver and splenic injury, if the patient is hemodynamically stable, then the patient can be treated conservatively.[7-9] After surgery patients were managed with continuous vitals monitoring, nasogastric tube, IV fluids, and antibiotics.

Inclusion criteria

Patients with signs of peritonitis, road traffic accident with suspected blunt abdominal injury, findings such as diagnostic peritoneal lavage or hemoperitoneum on FAST, blunt trauma abdomen in sports injury, uncontrolled shock or hemorrhage, history of accidental fall from height, story of fall of the heavy object over the abdomen.

Exclusion criteria

Patients with penetrating, gunshot injuries, stab, Patients of the pediatric age group were excluded.

Statistical analysis

The collected data were numerically coded and entered in Microsoft Excel 2007 and statistical analyzed. Socio-demographic, mode of injury and organs involved in patients who sustained blunt injury abdomen variables data were analyzed using descriptive statistics like frequencies and percentages assessment.

RESULTS

A total of 48 patients enrolled in this study. 35 (72.9%) Male patients and 13 (27.0%) female patients, male patients more commonly encountered blunt injury to the abdomen. The age group <20 years 6 (12.5%) and the highest age incidence for abdominal injury was for age group 21-40 years which constitutes 28 (58.3%) of the study the age group 41-60 years 12 (25.0 %) and the age group >61 years 2 (4.1%) (Table 1).

Table 1: Gender and age wise incidence of blunt injury abdomen (n=48).

Variable	No. of patients	Percentage (%)
Gender		
Male	35	72.9
Female	13	27.0
Age group (years)		
<20	6	12.5
21-40	28	58.3
41-60	12	25.0
>61	2	4.1

Authors compare the different modes of injury; the most common mode of injury was road traffic accidents 36 (75.0%) followed by assault/injury with blunt object 11 (22.9%) and fall from height 1 (2.0%) (Table 2).

Table 2: Mode of injury in patients who sustained blunt injury abdomen (n=48).

Mode of injury	No. of patients	Percentage (%)
Road traffic accident	36	75.0
Assault/injury with blunt object	11	22.9
Fall from height	1	2.0

Table 3: Organs involved in patients who sustained blunt injury abdomen.

Organs injured	No of patients	Percentage (%)
Splenic injury	25	52.0
Ileal perforation	6	12.5
Liver Injury	6	12.5
Others/combined	5	10.4
Mesentery	2	4.1
Pancreas	1	2.0
Renal injury	1	2.0
Jejunal perforation	1	2.0
Bladder injury	1	2.0

The organs injured most commonly encountered one was spleen 25 (52.0%), ileal perforation 6 (12.5%), liver injury 6 (12.5%) and 5 (10.4%) of cases had others/combined abdominal injuries. There were also 2

(4.1%) cases of mesentery, of pancreas, renal injury, jejunal perforation and bladder injury were seen in 1 (2.0%) cases (Table 3).

In this study grade III splenic injuries were encountered in majority (19 cases).[13] cases involved laceration of parenchyma >3 cm depth and 6 cases were subcapsular hematoma (>50%). All cases were taken up for laparotomy ending in splenectomy. 2 cases of grade II injury were encountered (laceration <3 cm) were taken for laparotomy due to associated injury (omental injury/hemoperitoneum) ending in splenectomy.3 cases of grade-IV type were seen with hilar vessel laceration and 1 case of grade-5 injury with shattered spleen were met with. All these cases with severe injuries were managed by splenectomy.

Ileal perforation was a total of 6 cases (12.5%). About 5 of the cases the defect was large involving more than two-thirds of the wall and one was associated with mesenteric tear and hence resection of the segment with primary anastomosis was done by 2-layer method. Authors encountered 6 cases of liver injury of which grade II injuries constituted the majority (4 cases) followed by grade III injuries (2 cases). Two cases of mesenteric injury with associated small bowel injuries were encountered. In one case primary suturing using 2-0 vicryl was done. In two cases we proceeded with resection and anastomosis for the associated small bowel injury. Injury to the Pancreas and kidney is usually by direct trauma. Both cases of pancreatic trauma required no surgery. One cases of renal injury was seen; one case was a grade-I injury with a non-expanding subcapsular hematoma. The case was managed conservatively. Jejunal perforation constituted about 1 case (2%) and three cases the defect being large underwent Resection and anastomosis using two-layered closure and one case proceeded with primary suturing.

DISCUSSION

The location and severity of the blow and the position of the victim when injured determine which combination of organs is affected.[2,10] These are life-threatening injuries. The stakes are high for the patient, and the demands on the surgical team are great. It is necessary that the early recognition and effective management of these injurious are essential for the survival and prevention of far-reaching complications.[11] In present study 35 (72.9%) were males and 13 (27.0%) were females. The most common cause of blunt injury abdomen is road traffic accident 75.0% which comparable to most other studies by Mohapatra et al and by Curie et al.[12,13] In present study assault/injury with blunt object 11 (22.9%) cases and Fall from height 1 (2.0%) case. The development of emergency medical services (EMS) has brought tremendous improvement in the management of blunt abdominal injuries. EMS comprises trauma squads, the persons trained in stabilizing and transport of injured persons to hospitals.[14] EMS intervene in the within one hour of injury and hence they play a major role in decreasing the mortality by initial resuscitation and by reducing the time lag between injury and hospitalization.[15] The grievously injured victims require prompt enlightened care to avoid catastrophic end results. Deaths are occurring every day, in many different settings, from injuries to the upper abdomen and lower rib cage that produce damage to the liver, spleen, and pancreas.[16] In present study, spleen was the most common organ injured in 25 (52.0%) of cases. Davis et al, reported that 24.7% of cases had splenic injuries, out of which 10.7% were operated and 14% were managed conservatively.[17] In this study liver injuries were present in 6 (12.5%) cases. By Davis et al, which showed 16.47% of liver injuries, of which 14% underwent laparotomy and suturing was done in all cases.[17] Another study by Curie et al showed 20.6% of liver injuries.[13] Study by Rutledge et al, spleen to be the most commonly injured organ than liver.[18] The grade of injury was assessed by ultrasonography and CT and was most of the time managed conservatively. Minor lacerations and capsular tears which are difficult to diagnose clinically can be easily demonstrated in ultrasonography and CT scan and were selected for non-operative management. The common surgeries performed in patients included splenectomy, primary closure of perforation and resection and anastomosis. Similar surgeries were required in patients of blunt abdominal trauma as reported by Siddique.[19] However the disadvantage of non-operative management is missed injuries resulting in increased morbidity and mortality. Operative intervention is needed in hemodynamically unstable patients who are not responding to aggressive fluid resuscitation and those with significant organ injuries and resection and anastomosis.

CONCLUSION

Blunt injury abdomen mainly affected men and the younger population between the age group 21-40 years. Most common mode of injury is road traffic accidents. In this study the spleen was found to be the most common organ injured in blunt injury abdomen. Early diagnosis of the extent of injury by appropriate imaging (X-ray, ultrasound or CT abdomen) and appropriate interventions, aggressive fluid resuscitation, blood transfusion, and operative interventions are crucial in management. Hemodynamically stable patients with solid organ injury, conservative management can be tried, and non-operative management is associated with less complication. Associated injuries like head injury, abdomino-thoracic injuries and fractures influence the outcome.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Bhandari V, Bhandari M. Comprehensive study of blunt injury abdomen in single center. Int Surg J 2020;7:710-3.