



COMPREHENSIVE STUDY OF BLUNT INJURY ABDOMEN IN PATNA MEDICAL COLLEGE AND HOSPITAL, PATNA

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ABSTRACT

Background: Abdomen is the third most common organ injured following extremities and head injury. CT scanning has increased the identification of injuries. The care of the trauma patient is demanding and requires dedication, diligence, and efficiency. To evaluate the type and frequency of injury of various intra-abdominal organs in the blunt trauma of the abdomen.

Methods: After a primary survey of these patients, brief history and complete physical assessment all the basic investigations were done. Skiagrams were taken routinely. Ultrasonogram (F.A.S.T SCAN) was done for all cases and a CT scan was done for selected cases.

Results: Road traffic accident was the most common mode of injury accounting for 76% cases. 36% of the cases were in the third decade of their lives. Spleen was the most common injured organ accounting for 52% of the cases.

Conclusions: Solid organs like spleen and liver were more commonly injured in blunt injury to abdomen than the other organs like mesentery, retroperitoneum, bladder etc.

KEYWORDS :

INTRODUCTION

Injury has been man's constant companion since ancient times. Modern trauma care has been increasing in sophistication all the time. The abdomen is a Pandora's box. It is commonly involved following blunt trauma.¹ The trauma can be either from road traffic accidents, assault, accidental fall from a height, sports injury or fall of a heavy object. High-velocity motor vehicle accidents account for 75-80% of blunt trauma of abdomen.² Blunt trauma can result from either compression (secondary to a direct blow or against a fixed external object) or from deceleration forces.³ Abdomen is the third most common organ injured following extremities and head injury. CT scanning has increased the identification of injuries.⁴ The care of the trauma patient is demanding and requires dedication, diligence, and efficiency. Evaluating patients who have sustained blunt abdominal trauma remains one of the most challenging and intensive aspects of acute trauma care.⁵ Missed intra-abdominal injuries and concealed hemorrhage are frequent causes of increased morbidity and mortality, especially in patients who survive the initial phase of an 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.⁶ In view of increasing number of vehicles, the consequent increase in high-velocity road traffic accidents, rampant increase in construction work, this study chosen to study blunt abdominal trauma, its frequency, different modalities of management and treatment outcomes.⁷

METHODS

The study was conducted in Patna Medical College and Hospital, Patna for a period of 2 year (August 2017- August 2019). The study comprises of 50 patients who sustained blunt abdominal trauma who were admitted and managed in our hospital. All patients were received in the casualty department by the casualty medical officer and the duty general surgeon was called to attend the patients. All the cases were registered as medico-legal cases.

Inclusion Criteria

- Patients presenting with a history of recent assault by the blunt/heavy object over the abdomen,
- Road traffic accident with suspected blunt abdominal injury
- History of accidental fall from height
- History of fall of the heavy object over the abdomen.
- Blunt trauma abdomen in sports injury

Exclusion Criteria

- Patients with penetrating/stab/gunshot injuries
- Patients of the pediatric age group

After a primary survey of these patients, brief history and complete physical assessment all the basic investigations were done. Skiagrams were taken routinely. Ultrasonogram (F.A.S.T scan) was done for all cases and a CT scan was done for selected cases. Based on the clinical finding and investigations, cases were managed. At laparotomy, a systematic approach with an examination of all intraabdominal organs was made. After surgery patients were managed with continuous vitals monitoring, Nasogastric tube, IV fluids, and antibiotics.

Statistical Analysis

Data were analyzed using SPSS software version 22 and MedCalc software version 15. Data were interpreted using descriptive and inferential statistics. The Chi-square test was used to test the statistical significance of the relationship between variables.

RESULTS

Table 1: Age incidence.

Age (years)	Number	Percentage (%)
<20	6	12
20-30	18	36
30-40	11	22
40-50	6	12

50-60	7	14
>60	2	4
Total	50	100

The highest age incidence for abdominal injury was for age group 20-30 years which constitutes 36 % of the study population followed by those in the age group 30 – 40 years (22%) both accounting for about of nearly total 60%.

Table 2: Mode Of Injury.

Mode of injury	No (%)
Road traffic accident	38 (76)
Assault	10 (20)
Fall from height	1 (2)
Fail of weight	1 (2)

Comparing the different modes of injury, the most common mode of injury was road traffic accidents (76%) followed by assault (20%) which accounted for 80% of total injuries.

Table 3: Specific Organ Injury.

Organs injured	No	Percentage (%)
Splenic injury	26	52.0
Liver injury	7	14.0
Ileal perforation	6	12.0
Others/combined	6	12.0
Mesentery	3	6.0
Renal injury	2	4.0
Pancreas	2	4.0
Bladder injury	2	4.0
Jejunal perforation	2	4.0

Among the organs injured most commonly encountered one was Spleen (52%) followed by liver (14%). 12% of cases had multiple abdominal injuries. There were also 6 cases of laeal perforation (12%). In our study grade III splenic injuries were encountered in majority (20 cases). 12 cases involved laceration of parenchyma >3cm depth and 8 cases were subcapsular hematoma (>50%). All cases were taken up for laparotomy ending in splenectomy. 2 cases of grade II injury were encountered (laceration <3cm) were taken for laparotomy due to associated injury (omental injury/hemoperitoneum) ending in splenectomy. 3 cases of grade-IV type was 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.

DISCUSSION

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.⁸ The location and severity of the blow and the position of the victim when injured determine which combination of organs is affected.⁹ 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.¹⁰ The development of EMS (Emergency Medical Services) 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.¹¹ 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.¹²

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We encountered 7 cases of liver injury of which Grade II injuries constituted the majority (5 cases) followed by grade III injuries (2 cases). All grade II injuries involving either a small subcapsular hematoma (3) or capsular tear with laceration <1 cm depth in the parenchyma (1) were managed conservatively and patients did well. Both the cases of grade-III injury, were managed conservatively.

Ileal perforation was a total of 6 cases (12%). 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. Jejunal perforation constituted about 4 cases (4%) and three cases the defect being large underwent Resection and anastomosis using two-layered closure and one case proceeded with primary suturing.

Solid organs are injured by a direct violence or deceleration injury because of protected position and ligament attachments.¹³ Injury to the kidney and Pancreas is usually by direct trauma. Both cases of pancreatic trauma required no surgery. Two cases of renal injury were seen. One case was a grade-I injury with a non-expanding subcapsular hematoma. The second one was a Grade 3 injury. Both the cases were managed conservatively. There was no associated intra-abdominal injury or urethral injury. Three 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. There was a case of urethral injury. There was urinary extravasation in perineum and blood at urethral meatus. AUG was done and found to be an anterior urethral injury. Urinary diversion was done by Suprapubic cystostomy.¹⁴

There is an increase in the trend towards conservative management if the patient is hemodynamically stable. The grade of injury was assessed by USG and CECT and was most of the time managed conservatively. Minor lacerations and capsular tears which are difficult to diagnose clinically can be easily demonstrated in USG and CECT scan and were selected for non-operative management. However, the disadvantage of non-operative management is missed injuries resulting in increased morbidity and mortality.¹⁵ Operative intervention is needed in hemodynamically unstable patients who are not responding to aggressive fluid resuscitation and those with significant organ injuries.¹⁹ The common surgeries performed in our 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.¹⁶

CONCLUSION

Blunt Abdominal Trauma is one of the important causes of morbidity and mortality in relatively young individuals. Most common mode of injury is road traffic accidents. 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. Associated injuries like head injury, abdomino-thoracic injuries and fractures influence the outcome. Hemodynamically stable patients with suspected blunt injury abdomen should undergo routine CT scanning preferably contrast-enhanced because of its high sensitivity and specificity.

REFERENCES

1. Allen RB, Curry AS. Abdominal trauma: a study of 297 consecutive cases. *Am J Surg.* 1957;93:398-404.
2. Brasel KJ, Olson CJ, Stafford RE, Johnson TJ. Incidence and significance of free fluid on abdominal computed tomographic scan in blunt trauma. *J Trauma.* 1998;44(5):889-92.
3. Dauterive AH, Flancbaum L, Cox EF. Blunt intestinal trauma. A modern-day review. *Ann Surg.* 1985;201:198-203.
4. Davis JJ, Cohn I, Mance FC. Diagnosis and management of Abdominal trauma due to child abuse. *J Trauma.* 1986;26:46-9.
5. DiVincenti FC, Rives JD, Laborde JE, Fleming ID, Cohn I Jr. Blunt Abdominal Trauma. *J Trauma.* 1968;8:1004-13.
6. Feliciano DV. Diagnostic modalities in abdominal trauma. Peritoneal lavage, ultrasonography, computed tomography scanning, and arteriography. *Surg Clin North Am.* 1991;72:241-56.
7. Fitzgerald JB, Crawford ES, DeBakey ME. Surgical consideration of non-Penetrating abdominal injuries. *Am J Surg.* 1960;100:22-9.
8. Goldman LI, De Laurentis DA, Rosemond GP. Penetrating abdominal wounds in a civilian population. *Am J Surg.* 1962 Jul 1;104(1):46-51.
9. Holmes JF, Offerman SR, Chang CH, Randel BE, Hahn DD, Frankovsky MJ, et al. Performance of helical computed tomography without oral contrast for the detection of gastrointestinal injuries. *Ann Emerg Med.* 2004;3(1):120-8.
10. Jain BC, Jolly S, Cyadhyay M. Blunt abdominal trauma. A clinical study of 100 cases. *Ind Jr of Surg Jan.* 1993;66:290-3.
11. Jansen JO, Yule SR, Loudon MA. Investigation of blunt abdominal trauma. *BMJ.* 2008;336(7650):938-42.
12. Kar S, Mohapatra V, Rath PK. Isolated mesenteric vascular injury following blunt abdominal trauma leading to massive segmental gangrene of small gut: a case report. *J Clin Diagn Res.* 2016;10:PD16-PD17.
13. Martin JG, Shah J, Robinson C, Dariushnia S. Evaluation and Management of Blunt Solid Organ Trauma. *Tech Vasc Interv Radiol.* 2017;20:230-6.
14. Mukhopadhyay M. Intestinal injury from blunt abdominal trauma. *Oman Med J.* 2009;24(4):256-9.
15. Shamuganathan K. Multi-detector row CT imaging of blunt abdominal trauma. *Semin Ultrasound CT MR.* 2004;25(2):180-204.
Siddique MAB, Rahman MK, Hannan ABMA. Study on abdominal injury: analysis of 50 cases. *TAJ.* 2004;