

Analysis of visceral injuries in blunt abdomen trauma

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Abstract

Introduction: The incidence of abdominal trauma makes trauma as one of the leading causes of acute abdomen in the day to day surgical practice. It accounts for the majority (80%) of abdominal injuries seen in emergency department, and is responsible for substantial morbidity and mortality. **Aims and Objectives:** To Analyze the Visceral Injuries in Blunt Abdomen Trauma. **Methodology:** This clinical study was carried out on patients admitted in trauma care unit and Dept. of General Surgery, Aarupadai Veedu Medical College, Puducherry for a period of 2 years. From the above mentioned source, 120 consecutive cases were taken. Patients admitted with history of blunt trauma abdomen due to road traffic accidents, accidental falls, and trauma by blunt objects and assault were included into study while Associated Orthopaedic Injuries, Associated With Severe Head Injury, Associated With Severe Chest Injury, Pregnancy were excluded from the study. In case of death, the cause of the death was noted. **Result:** Maximum of cases were in 21-30 age group (29.3%) followed by 11-20 and 31-40. Average age was 25.1 years. 96 (80%) patients were male 24 (20%) were female. Male to female ratio was 4:1. Most common cause of blunt trauma to abdomen was road traffic accidents 82 (68.33%), second common cause was fall from height (20%). Other causes were hit by blunt objects and assaults. Liver was the most common organ involved in 32 of cases, Spleen was the second most common organ injured in 20 of cases. Small bowel was injured in 16 cases. Mesentery was injured in 17 cases. Combined injuries in 15 cases. Out of 120 cases 82 (68.33%) were managed surgically and 38 (31.66%) managed conservatively. duration of the stay ranged from 6-34 days. maximum number of cases (60) 50% stayed for below 10 days. 30 cases stayed for 11-20days. 4 cases stayed for >20 days, septicaemia was the most common cause of death (14 cases). Remaining 2 patients died of ARDS and sudden cardiac arrest. **Conclusion:** The age and sex distribution of the patients, etiology of the blunt trauma to abdomen and average hospital stay; causes of the death are useful for the future management and prevention of injuries. In Present Study We Concluded That Operative Procedure Was The Best Method Of Treatment Option If Patient Is Unstable And Early Laporotomy Decreases The Mortality In Blunt Trauma Patients

Keywords: Blunt Abdomen Trauma, Visceral Injuries, Organ Injuries.

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INTRODUCTION

The incidence of abdominal trauma makes trauma as one of the leading causes of acute abdomen in the day to day surgical practice. It accounts for the majority (80%) of abdominal injuries seen in emergency department¹, and is responsible for substantial morbidity and mortality. Blunt injury as cause of intra-abdominal injuries has been recognized since historical times. Aristotle was the first to record visceral injuries from blunt trauma. Hippocrates

and Galen are said to have given apt description of the condition. By 1500 BC distinct triage and surgical protocol had been developed in Babylonia under the rule of Hammurabi as said by Edwin Smith Papyrus. The first American report of physician performed abdominal ultrasonography in the evaluation of blunt abdominal trauma was published in 1992 by so and colleagues.² In 1926, neuhof and cohen described the sampling of peritoneal fluid in cases of acute pancreatitis and blunt trauma by passing a spinal needle through the abdominal wall.³ In 1965, Root *et al* reported the use of percutaneous DPL in patients who had sustained blunt trauma.⁴ Hepatic injuries: Approximately 85% of all patients with blunt hepatic trauma are stable. In this group, non-operative management significantly improves outcomes over operative management in terms of decreased abdominal infections, decreased transfusions, and decreased length of hospital stay⁵. For unstable patients, operative surgery is still the rule, with the damage control approach now

accepted as the standard of care.⁶ Bleeding is controlled, often by use of peri hepatic packing and the patient's time in the operating theatre is kept to a minimum. CT scanning is the mainstay of diagnosis for hepatic injuries after blunt trauma in the stable patient; the initial CT findings will help the trauma surgeon to determine the suitability for non-operative treatment. Some of the factors likely to lead to a failure of non-operative management of blunt liver injury have been identified.⁷ They include; Hemodynamic instability, Grade of injury (grade III and IV) according to the American Association for the surgery of trauma scale. Periportal tracking Contrast pooling on CT scan. Management of gastric injuries:⁸ Once a gastric wound is suspected or confirmed, surgery is indicated. As a consequence of its large size and ample blood supply, most wounds of the stomach are amenable to local, primary repair, by either hand-sewn or stapling techniques. Occasionally, extensive gastric wounds require gastric resection. Management of duodenal injuries: Diagnosis: Routine laboratory tests are nonspecific for duodenal injury. Similarly plain films of the abdomen may be non-diagnostic. Free air is an unusual finding that is seen in less than 10% of cases and evidence of retroperitoneal air may be absent in more than 50% of patients with duodenal rupture. Isolated blunt injury of duodenum is more difficult to diagnose than penetrating injuries. Despite progression of the imaging techniques, the diagnosis still remains critical and may be delayed in particular, when there is perforation of retroperitoneal part of duodenum⁹ Operative management¹⁰ Suspected or proved full-thickness perforations of the duodenum require urgent laparotomy. Once a duodenal wound is identified, several factors must be considered when choosing an operative repair strategy : extent of injury, presence of associated injuries to the pancreas or bile ducts, time from injury to repair and physiologic condition of the patient.

MATERIAL AND METHODS

This clinical study was carried out on patients admitted in trauma care unit and Dept. of General Surgery, Aarupadai Veedu Medical College, Puducherry for a period of 2 years. From the above mentioned source, 120 consecutive cases were taken. Patients admitted with history of blunt trauma abdomen due to road traffic accidents, accidental falls, and trauma by blunt objects and assault were included into study while Associated Orthopaedic Injuries, Associated With Severe Head Injury, Associated With Severe Chest Injury, Pregnancy were excluded from the study. An informed consent was taken careful history was taken along with thorough physical and general examination. The patients were operated on emergency

basis (or) wait and watch policy, operative findings were noted. Follow up study done and complications noted. For patients undergoing conservative line of treatment, Ryles tube aspiration, pulse and blood pressure monitoring, urine output measurement done, analgesics and antibiotics given and the patient was put on observation. In case of death, the cause of the death was noted.

RESULT

Table 1: Age wise distribution

Age (in years)	Number of cases	Percentage
1-10	10	9.3%
11-20	30	25%
21-30	34	29.3%
31-40	30	25%
41-50	10	9.3%
51-60	6	5%
Total	120	100

In the present study, maximum of cases were in 21-30 age group (29.3%) followed by 11-20 and 31-40. Average age was 25.1 years. Range was from 5 to 60 years.

Table 2: Sex wise distribution

Gender	Number of cases	Percentage
Male	96	80%
Female	24	20%
Total	120	100%

In the present studies, 96 (80%) patients were male 24 (20%) were female. Male to female ration was 4:1.

Table 3: Aetiology of Injuries

Road traffic accidents	82	68.33%
Fall from height	20	16.66%
Hit by blunt objects	14	11.6%
Assault	4	3.3%
Total	120	100%

In this study, most common cause of blunt trauma to abdomen was road traffic accidents 82 (68.33%), second common cause was fall from height (20%). Other causes were hit by blunt objects and assaults.

Table 4: Organ involved

Organ	Number of cases	Operate d	Conservati ve
Spleen	20	8	12
Liver	32	20	12
Small Bowel	16	16	-
Mesentery	17	12	5
Large bowel	14	14	-
Pancreas	2	0	2
Urinary bladder	2	2	-
Retro peritoneal	2	2	-
Haematoma			
combined	15	8	7

In this study, liver was the most common organ involved in 32 of cases, Spleen was the second most common organ injured in 20 of cases. Small bowel was injured in 16 cases. Mesentery was injured in 17 cases. Combined injuries in 15 cases.

Table 5: Management

Treatment	Number of cases	Percentage
Surgical	82	68.33%
Conservative	38	31.66%
Total	120	100

Out of 120 cases 82 (68.33%) were managed surgically and 38 (31.66%) managed conservatively.

Table 6: Duration of Hospital stay

< 10	60	50%
11-20	30	25%
>20	4	3.3%

In the present study, duration of the stay ranged from 6-34 days. maximum number of cases (60) 50% stayed for below 10 days. 30 cases stayed for 11-20days. 4 cases stayed for >20 days.

Table 7: Causes of death

Causes	Number of cases
Septicaemia	14
Sudden cardiac arrest	1
ARDS	1
Total	16 (13.3%)

In this study, septicaemia was the most common cause of death (14 cases). Remaining 2 patients died of ARDS and sudden cardiac arrest.

DISCUSSION

Blunt abdominal trauma is the leading cause of morbidity and mortality in all age groups. Identification of serious intra-abdominal pathology is often challenging. Many injuries may not manifest during the initial assessment and treatment period. Young males, most of those aged 20-30 years have been reported to be the most frequent victims. In the present study, the maximum number of cases was in the second decade of life (30%). Most of the cases were in first four decades of life. This indicates trauma is more common in young people. Range was from 5 years to 60 years. There were only 16 cases beyond 40 years of age. Average age was 25.1 years. The present study, comparable to study of Davis *et al*, reveals that majority of patients belonged to 21-30 years. Another study Mousami *et al* showed: The age of the victims in this study varies from 1-70 years. In that, peak incidence was 20-30 yrs. (38.18%), it was also observed that 29.9% belonged to the age group of 30-39 years. So the highest number of cases due to blunt injuries to the abdomen occurred in 2nd and 4th decade of life. Another study by Richard curie which showed maximum number

of cases in second decade (35%) ranging from 3-60 years with mean age of 28 years. Similar observations were also made by ALLEN *et al* which showed 28% of cases between 20-29 years of age and WILLIAMS AND ZOLLINGER showed 66% cases between 10-30 years of age. The most common cause of blunt injury abdomen is road traffic accidents (68.8%) which are comparable to most other studies. Mohammed a Gad *et al* study showed 62.8% of motor vehicle accidents were the cause of blunt trauma abdomen,. Mousami *et al* study showed 70.9% of RTAs and 5% fall from height. Mohapatra *et al* also reported 62% cases of blunt injury abdomen were due to RTA. Mean duration of hospital stay in present study was little higher as compared to other studies (Mohapatra *et al*) which reported mean hospital stay of 7.8% days for non operated group and 10.4 days for operative group. Maximum duration of hospital stay in his study was 33 days for a patient who had anastomotic leak

Sr. No.	Study Conservative	(Hospital stay in days)	Surgery
1	Mohapatra et al	7.8	10.4
2	Present study	7	13

The most frequently injured organs in blunt trauma abdomen are spleen (40-55%), liver (35-45%) and retro peritoneum (5%) In present study, liver was the commonest organ injured. Out of these 32 cases, 12 were managed conservatively and 20 were operated. Suturing done for liver lacerations in 12 cases, application of gelatin sponge done in 4 cases, hemoperitoneum drained in 4 cases. Present study is comparable to study of MOUSAMI *et al* showed liver was the commonest organ involved (62.27%) and spleen 30.91%, small intestine 18.8% and kidney 18.8% cases. Another study Davis *et al* which showed 16.47% of liver injuries, out of which 14% underwent laparotomy and suturing was done in all cases.

Organs Involved Sl. No	Study	Liver	spleen	Small bowel
1	Mosami <i>et al</i>	62.27%	30.91%	18.18%
2	Davis <i>et al</i>	16.47%	24.7%	-
3	Present study	26.66%	16.66%	13.33%

Out of 120 cases in present study 68.33% were managed surgically and 31.6% were managed conservatively. This study is comparable to Mohapatra *et al* who reported 39% laparotomy rates in their series. Non operative management consisted of Nasogastric aspiration, urine output measurement, I.V fluids, analgesics and antibiotics. In present study a total of 52 cases were found to be having solid organ injury. Out of which 24 were managed conservatively and 28 cases were managed surgically. All patients in non-operative group recovered

well except three patients. A study by Rutledge *et al*¹² also showed that incidence of non-operative management in 48% of both hepatic and splenic injuries. In present study, out of 120 cases, 16 cases ended in mortality, septicaemia was the most common cause of death (14 cases). Sudden cardiac arrest was cause of death in one case and ARDS was cause of death in another case. This study was compared to another study by Jolly *et al*¹³ which showed 10% mortality in their study with septicaemic shock the most common cause of death. Another study by Davis *et al* showed 15% mortality with septicaemia the most common cause of death.

Mortality Sl. No	Study	Percentage
1	Di-vincenti <i>et al</i>	23%
2	Cox <i>et al</i>	10%

CONCLUSION

The age and sex distribution of the patients, etiology of the blunt trauma to abdomen and average hospital stay; causes of the death are useful for the future management and prevention of injuries. In Present Study We Concluded That Operative Procedure Was The Best Method Of Treatment Option If Patient Is Unstable And Early Laparotomy Decreases The Mortality In Blunt Trauma Patients.

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