

Abdominal Trauma- A Clinical Profile

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Abstract: The aim of the present study is to comprehensively study the incidence of blunt & penetrating abdominal injuries, incidence of injury to different intra-abdominal organs and its aetiology, the importance of the various investigations, the mode of treatment offered, to study the postoperative complications (if any). Patients and methods: This hospital based prospective study includes 40 consecutive cases of blunt injury abdomen admitted in Guntur Medical College and General Hospital between 1st October 2015 to 31st March 2017. Results: Pain abdomen was the commonest symptom while Generalized tenderness was the commonest physical sign. Accuracy rate of plain X- ray erect abdomen was 88.9% and ultrasound abdomen was 96.15%. Commonest organ involved was spleen (40.9%) followed by liver (22.7%), small intestine (18.2%), mesentery (13.6%) of total intra-abdominal injuries in blunt abdominal trauma and colon and rectum (20%) was the most common organ involved in penetrating trauma. 7.5% had associated chest injury with fracture ribs. Wound infection was the commonest complication.

Keywords: Abdominal Trauma, Splenic Injury, Blunt Trauma, Penetrating Trauma, Perforation

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I. Introduction

Injury is the leading cause of death and disability in the first four decades of life and is the third most common cause of death overall. In India communicable diseases continue to take the major share even now, still injury is responsible for 7% of all deaths. About 1 in 40,000 individuals die in India every year, whereas approximately double the number is disabled and this number is increasing. By convention, injury is classified into several categories - Penetrating, Blunt or Non-penetrating, Blast overpressure, Thermal, Chemical and others including crush and barotrauma. In blunt injuries, the damage may be caused by acceleration, deceleration, rotational or shearing forces.

Trunkey has classified death attributable to trauma, broadly into three groups, giving a distinct trimodal pattern.

1. Immediate deaths (50%)
2. Early deaths (30%)
3. Late deaths (20%)

It is among those cases represented by second and third peaks that potentially preventable deaths occur. Of one fourth to one third of the deaths from trauma could be prevented by effective initial care. The primary aids like airway management, restoration of circulation, care of cervical spine, cardiopulmonary resuscitation is carried out in the initial stages. Roughly 10% have life threatening injuries where rapid diagnosis and therapy is crucial for survival.

Scoring systems have been developed to facilitate triage, research and quality assurance. More recently their ability to predict morbidity and mortality particularly septic complications has been studied. With the increase in the number of motor vehicle accidents, there is rising incidence of abdominal trauma. The abdomen is the third most commonly injured body region, with injuries requiring operation in about 20% of civilian trauma victims. Abdominal injuries can be particularly challenging because it is often difficult to assess the intra abdominal pathology in the multiple injured victim. There is also masking of abdominal injuries by associated conditions like head injuries, fractures, alcoholism, drug abuse, shock etc.

Initial clinical assessment of the abdomen in blunt trauma is accurate in only 70-80% of cases. Laparotomy should be done in a patient with multiple injuries where all clinical and other investigations have failed to exclude the abdomen as a source of shock syndrome. With the surge of advancing technology in the field of diagnostic modalities for abdominal trauma, conservative therapeutic approach has been increasing with decreased operative intervention especially for solid organ injuries.

The objective behind my study was to present a comprehensive picture of the recent concepts in assessment and management of abdominal injuries in our setup and to highlight upon the diagnostic difficulty it poses and the distressing high mortality it carries.

II. Aims And Objectives

The aim of the present study is to comprehensively study the incidence of blunt & penetrating abdominal injuries, incidence of injury to different intra-abdominal organs and its etiology, the importance of the various investigations, the mode of treatment offered, to study the post-operative complications and cause of death to evolve a better management.

III. Materials And Methods

3.1 SOURCE OF DATA: Patients diagnosed with blunt injury abdomen admitted in Guntur Medical College and General Hospital between 1st October 2015 to 31st March 2017 (18 months)

3.2 STUDY DESIGN: Hospital based prospective study.

3.3 INCLUSION CRITERIA: All patients with blunt and penetrating, abdominal injury with intra abdominal injuries (40) were included in the study.

3.4 EXCLUSION CRITERIA: Those patients admitted with injury to external genitalia and those without any intra abdominal injuries without gaining admission into the department of surgery were excluded from the study. Patients who died before confirmation of definitive diagnosis were also excluded from this study.

3.5 METHOD OF COLLECTION OF DATA:

40 consecutive cases were admitted, examined, investigated and operated during the period of 1st October 2015 to 31st March 2017. Detailed history of all the cases was taken. Patients were methodically enquired according to the proforma. A detailed history as to the mode of injury, thorough clinical examination and necessary investigations like routine investigations, special investigations including ultrasound and CT scan were done.

3.6 SURGICAL PROCEDURE:

The management was individualized and each case was assessed on its own. In patients where laparotomy was performed after resuscitation, the details regarding the viscera injured and nature of surgery performed were recorded.

Each case was carefully followed up to evaluate the progress of patient and to note the development of complications, if any and its management. All operations were done under General Anaesthesia. Laboratory results, operative findings, operating time, intra-operative and post-operative complications and length of hospital stay were recorded.

IV. Observations And Results

The present study is a hospital based prospective study, which included a total of 40 cases that were studied over a period of 18 months, and were treated on inpatient basis at Government General Hospital, Guntur from 1st October 2015 to 31st March 2017.

Table 1: Association With Intra Abdominal Injury

Cases	Blunt Injury Abdomen	Penetrating Injury Abdomen	Total	%
With intra abdominal injury	22(55%)	10(25%)	32	80%
Without intra abdominal injury	8 (20 %)	0	08	20%
Total number of cases	30 (75%)	10 (25%)	40	100%

Table 2: Isolated Organ Injury

Organ Injured	Blunt Trauma	% of Total Intra-abdominal Injuries	Penetrating Trauma	%
spleen	9	40.9%	1	10%
liver	5	22.7%	1	10%
Small intestine	4	18.2%	1	10%
Mesentery	3	13.6%	2	20%
Retroperitoneal hematoma	1	4.5%	1	10%
Colon and rectum	-	-	2	20%
Kidney, Ureter and Bladder	-	-	1	10%
stomach	-	-	1	10%

Table 3: Associated Injuries

Associated Injuries	No. Of Patients	Percentage
With chest injury and fracture ribs	3	7.5%
With pelvic fracture	3	7.5%
Extremities fractures	2	5%

Table 4: Management

Management	Blunt Trauma	Penetrating Trauma	Total	Percentage (%)
Surgical	25	10	35	87.5
Conservative	5	0	5	12.5

Table 5: Complications

Type Of Complication	Blunt Injury	Penetrating Injury	Total No. Of Patients	Percentage
Wound Infection	4	3	7	17.5%
Respiratory Infection	3	2	5	12.5%
Intra abdominal abscess	2	0	2	5%
Septicemia	2	0	2	5%
Wound dehiscence	1	1	2	5%
Reactionary hemorrhage	1	0	1	2.5%
Enterocutaneous fistula	1	1	2	5%

Table 6: Mortality

Cause of Death	No. of Patients
Respiratory Infection	1
Septicemia	2
Reactionary hemorrhage	1

V. Discussion

In this study, cases were in between 18 – 79 years. There was an increased incidence in the 5th & 6th decade with maximum incidence in the 5th decade. Similar incidence was seen in the studies of Herman et al which showed peak incidence in 5th decade.

1. Cause of injury

In our study it was found that the most common mechanism of blunt injury abdomen was road traffic accidents 65.5% followed by fall from height 10% and most common cause of penetrating injury was stab injury (7.5%) followed by fall from height (5%).

2. Symptoms

The commonest symptom was pain abdomen present in all patients (100%) followed by vomiting (40%). Other modes of presentation were abdominal distension (35%), retention of urine (20%), chest pain (10%), hematuria (7.5%), hematemesis (5%) and loss of consciousness (5%).

3. Physical Signs

In our study, generalized tenderness was present in 77.5% of patients, guarding or rigidity in 67.5%, distension of abdomen in 52.5%, absent bowel sounds in 37.5% and localize tenderness in 22.5%.

4. Investigations

Routine investigations like haemoglobin %, bleeding time, clotting time, blood grouping and Rh typing, and urine examination were done in all cases. Liver function test, serum amylase, serum electrolytes and chest X- ray were done whenever warranted. Plain X- ray erect abdomen was done in all patients which helped in diagnosing hollow viscus injury by showing gas under the diaphragm. Diagnostic paracentesis was done in 22 patients; in 19 cases it was true positive, true negative in 1 case and false negative in 2 cases. Hence accuracy of diagnostic paracentesis in our study was 90.9%.

Ultrasound of abdomen was done in all patients. In one case, ultrasound failed to show splenic injury which was found at laparotomy. Hence, accuracy rate of ultrasound abdomen in blunt injury abdomen in our

study was 96.15%. Retrograde cystourethrogram was done in a case of suspected bladder injury, where it helped to diagnose the same. Chest and axial skeleton X-ray were done in case of associated chest injury and extremities injury. CECT abdomen was done in stable patients.

5.Organs Involved

In our study, commonest organ involved was spleen (40.9%) followed by liver (22.7%), small intestine (18.2%), mesentery (13.6%) of total intra-abdominal injuries in blunt abdominal trauma and colon and rectum (20%) was the most common organ involved in penetrating trauma. Spleen is most commonly involved solid in blunt injury abdomen because of its mobility, its attachment to many of the structures in the left upper quadrant and its position and intimate contact with 9th, 10th and 11th ribs.

6.Associated Injuries

In our study, 80% of the patients had only isolated abdominal injuries; 20% cases had associated injuries like chest injury, rib fractures, long bone fractures and pelvic fracture.

7. Management

Out of 30 cases of blunt trauma, 25 patients were managed surgically and 5 patients were managed conservatively. Guidelines for conservative treatment were:

1. Hemodynamic Stability of the patient
2. Minimal intra Peritoneal collection
3. Class I Injury of Solid organs.

Most of the blunt abdominal patients managed conservatively are those with low grade splenic injury. One patient had combined grade I spleen and grade I liver injury. Surgical management decisions were taken based on the results of physical examination, ultrasound abdomen and diagnostic paracentesis. All the penetrating abdominal trauma cases were managed surgically.

8.Complications

In our study, postoperative minor wound infection(superficial surgical site infection) was the commonest complication 17.5% and most infections were associated with bowel injury with peritonitis and in those cases that were brought to the hospital late. Three cases 12.5% developed respiratory infection which subsided with antibiotics and chest physiotherapy. Two cases (5%) developed septicemia, all of whom expired as a result of multiple organ failure. Two cases (5%) developed intra abdominal abscess and two cases (5%) developed wound dehiscence; two cases developed intestinal fistula and one case developed reactionary haemorrhage all of which were managed conservatively. One of the patient with wound dehiscence required secondary suturing. *Escherichia coli* is the most common organism isolated from superficial surgical site infection and commonly sensitive to amikacin and gentamycin. Wound infection is most commonly associated with bowel perforation.

9.Mortality

We had a mortality of 10%, 4 out of 40 patients, 3 deaths were in the late postoperative period, one case expired in the early postoperative period whom expired as a result of reactionary haemorrhage. The mortality was high; reason might be patient reaching the hospital late, high incidence of postoperative septic complications.

VI. Conclusion

- Maximum numbers of cases were in the age group of 20 to 39 years.
- 77.5% of injured were males. Road traffic accident was the commonest mode of injury in blunt injury abdomen accounting for 65% of the cases, stab injury was the commonest mode of injury in penetrating trauma accounting for 7.5%.
- Pain abdomen was the commonest symptom (100%) followed by vomiting in 40% of cases and distension of abdomen in 35% of cases.
- Generalized tenderness was the commonest physical sign present in 77.50% of cases followed by guarding/rigidity present in 37% of cases.
- 70% of cases came to the hospital within 24 hours of the injury.
- Accuracy rate of plain X- ray erect abdomen was 88.9% and ultrasound abdomen was 96.15%.
- Commonest organ involved was spleen (40.9%) followed by liver (22.7%), small intestine (18.2%), mesentery (13.6%) of total intra-abdominal injuries in blunt abdominal trauma and colon and rectum (20%) was the most common organ involved in penetrating trauma. 7.5% had associated chest injury with fracture ribs.
- Majority of intestinal injuries were perforations.

- 87.5% of the cases were managed surgically and 12.5% conservatively.
- 63% of the patients managed surgically were operated upon within 13 to 24 hrs after admission and 34% were operated upon 7 to 12 hours after admission. 70% of patients stayed for a period of 8 to 14 days in the hospital.
- Most of bowel injury cases managed by closure of perforation, 2 cases resection & end to end anastomosis was done.
- 1 case of extra peritoneal rupture of bladder was managed by closure of rent in two layers with suprapubic bladder drainage.
- Wound infection was the commonest complication 17.5% followed by respiratory infection 12.5%.
- Overall mortality rate in our study was 10 %.

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