

Blunt Abdominal Trauma and Its Surgical Management – A Clinical Study in a Tertiary Care Unit

Dr. Pentapati Veera Durga Rani¹, Dr. G. Purushotham², Dr. K. Appa Rao³,
Dr. N. Ram Kishan⁴

¹First Author: M.S. [General Surgery] Assistant Professor in Dept. of General Surgery, Siddhartha Medical College/GGH, Vijayawada, A.P., India

²Corresponding Author: M.S. [General Surgery] Assistant Professor in Dept. of General Surgery, Siddhartha Medical College/GGH, Vijayawada, A.P., India

³M.S. [General Surgery] Professor in Dept. of General Surgery, Siddhartha Medical College/GGH, Vijayawada, A.P., India

⁴Post Graduate in Dept. of General Surgery, Siddhartha Medical College/GGH, Vijayawada, A.P., India
Corresponding Author: Dr. G. Purushotham

Abstract: The aim of the present study is to study the mode of injury and the clinical presentation of Blunt injury abdomen and the presence of associated injuries and to study the methods of evaluation, decision making and management in these cases. **Patients and methods:** This hospital based prospective clinical study includes 60 patients of blunt abdominal trauma of various intra-abdominal lesions which reported to Siddhartha Medical College and General Hospital between July 2016 to December 2017. **Results:** Majority of these patients (70 %) were in the age group of 11-40 years, which is a period of activity. Males outnumbered females, the ratio being 5:1, only 10 out of 60 patients were females. Majority had a history of Road traffic accident and abdominal pain and tenderness, guarding and rigidity were noted most often. Most of the patients with simple abdominal injuries had an average hospital stay of about 10 days. Overall accuracy of diagnostic peritoneal tap is about 62.5%.

Keywords: Blunt Abdominal Trauma, Diagnostic Peritoneal Tap, Surgical Management.

Date of Submission: 12-03-2018

Date of acceptance: 26-03-2018

I. Introduction

Trauma (or) injury has been defined as damage to the body caused by an exchange with environmental energy that is beyond body's resistance. Civilian trauma remains the fourth leading cause of death in U.S and the most frequent cause of mortality in persons under 45 years of age. More than half of this trauma – related deaths are the result of motor vehicle accidents. Other common causes include falls, gunshot or stab wounds, poisoning, burns and drowning. Abdomino-pelvic trauma accounts for a large fraction of this tragic loss of life and continues to be a distressingly frequent cause of preventable death. Peritoneal signs in these patients can be subtle and frequently unreliable, secondary to distracting pain from associated injuries or decreased sensorium owing to intoxicants or head injury.

Abdominal injuries are of two types

1. Open injuries (stab injuries, bullgore injuries, gunshot injuries and other penetrating injuries).
2. Closed injuries (vehicular accidents, blows, kicks, falls, run over accidents).

There is general agreement among the clinicians from various countries that closed abdominal trauma is considerably more lethal than penetrating wounds as it poses much diagnostic problem to the clinician because of absence of apparent external injury and so clinician is dependent on a history of trauma and on his diagnostic skill.

Favourable outcome of these critically injured patients demands an integrated multi-disciplinary team effort beginning at the injury of scene and continuing through rehabilitation. Initial management is dictated by patient's immediate physiologic requirements for survival (i.e., ABCs – airway, breathing, circulation) and is often initiated before the establishment of specific diagnosis. Multiple life-threatening injuries often coexist, requiring rapid triage with simultaneous diagnostic and therapeutic interventions. The trauma surgeon must assume ultimate responsibility for the injured patient, assimilating key diagnostic results and orchestrating specific management, implemented by trauma team members.

II. Aims And Objectives

- To study the mode of injury and the clinical presentation of Blunt injury abdomen and the presence of associated injuries.
- To study the methods of evaluation, decision making and management of these cases.

III. Materials And Methods

3.1 SOURCE OF DATA: Total number of cases reported to the hospital were 770 out of which 60 cases were selected for presentation. 60Patients of blunt abdominal trauma of various intra-abdominal lesions which reported toSiddhartha Medical College and General Hospital between July 2016 toDecember 2017 are studied.

3.2 STUDY DESIGN: Hospital based prospective clinical study

3.3 INCLUSION CRITERIA:

- Patients between 18 years and 70 years of age
- Patient willing to participate in study and given informed consent

3.4 EXCLUSION CRITERIA:

- Pregnant patients.
- Patients < 18 years of age
- Patients who sustained penetrating abdominal trauma

IV. Observations And Results

The present study is a hospital based prospective study of 60 patients who underwent emergency laparotomy for blunt injury abdomen at Government General Hospital, Vijayawada from July 2016 to December 2017. The analysis is based on the mode of injury, clinical presentation, methods of evaluation, management and post-operative course in these patients.

INCIDENCE:

The total number of all cases admitted to surgical emergencies at Government General Hospital, Vijayawada were 16,440cases. Out of which 770 cases admitted were being due to Blunt Injury Abdomen constituting about 4.68% of all surgical emergencies admitted. Majority of these patients (70 %) were in the age group of 11-40 years, which is a period of activity. Males outnumbered females, the ratio being 5:1, only 10 out of 60 patients were females.

Table 1:Demographic Profile of Patients in Present Study

AGE GROUP	MALE	FEMALE	NO. OF PATIENTS	PERCENTAGE
0-10 years	4	-	4	6.67
11-20 years	12	2	14	23.34
21-30 years	14	4	18	30.00
31-40 years	8	2	10	16.66
41-50 years	8	2	10	16.66
>50 years	4	-	4	6.67
Total	50	10	60	100.00

Table 2:Mechanism of Injuries in Present Study

TYPE	NO. OF PATIENTS	PERCENTAGE
Road traffic accidents	28	46.67
Fall from heights	20	33.34
Assault	4	6.66
Domestic accidents	2	3.33
Others	6	10.00
Total	60	100.00

Table 3:Clinical Presentation

CLINICAL PRESENTATION	NO. OF PATIENTS	%
Shock, hypotension	24	40.0
External abdominal injury	12	20.0
Abdominal pain, tenderness	50	83.3
Guarding, rigidity	40	66.7
Shifting dullness	20	33.33
Liver dullness obliteration	15	26.6
Absent bowel sounds	30	50.0
Equivocal abdominal signs	6	10.0

When patients were first seen in Emergency room, abdominal pain and tenderness, guarding and rigidity were noted most often. 24 patients were brought with signs of hemorrhagic shock. About 10 % of the patients had no definite signs suggestive of intra-abdominal injury and they were classified as patients with equivocal abdominal signs. Various authors have commented on the unreliability of clinical signs alone in the diagnosis of blunt abdominal trauma. In our study, routine laboratory investigations were not of much help in the diagnostic evaluation of the patients. Plain X-ray of abdomen revealed haziness or ground glass appearance in about 10 patients, and gas under right dome of diaphragm in 8 patients. 48 patients in our study were subjected to peritoneal tap. 30 patients had positive peritoneal tap and underwent an emergency exploratory laparotomy. In one of them no significant intra-abdominal injury is identified. Out of 18 patients with negative peritoneal tap, subsequent laparotomy revealed significant abdominal trauma in 16 patients and no visceral injury in 2 patients. Thus the overall accuracy of diagnostic peritoneal tap is about 62.5%.

Table 4: Time Interval Between Injury and Surgery

TIME INTERVAL BETWEEN INJURY AND SURGERY	NO. OF PATIENTS
First day	38
Second day	12
Third day	6
After 3 days	4

Table 5: Organ Injured

ORGAN INJURED	OPERATIVE PROCEDURE	NO. OF PATIENTS
Spleen	Splenectomy	12
	Splenorrhaphy	4
Liver	Hepatorrhaphy	2
	Omental pack	2
	Hemostasis and drainage	6
Small bowel	Primary closure of perforation	6
	Resection and end to end anastomosis	8
Colon	Closure of perforation	3
	Colostomy	2
Duodenum	Duodenorrhaphy	2
Retroperitoneal hematoma	Conservative	6
Kidney	Nephrectomy	1
	Conservative	1
Diaphragm	Repair with non-absorbable suture	1
Pancreas	Peritoneal lavage and drainage	1
Mesentery	Closure of tear	2
Omentum	Ligation of omental tear	1
Bladder	Closure of tear and suprapubic cystostomy	1
Thoracic trauma	Intercostal tube drainage	10

Most of the patients with simple abdominal injuries had an average hospital stay of about 10 days. Majority of the patients with associated injuries had prolonged hospital stay even for about one to two months in orthopaedic or neurosurgical care. Post operative complications were seen in about 32 patients.

Table 5: Post Operative Complications

POST OPERATIVE COMPLICATIONS	NO. OF PATIENTS
Bronchopneumonia	16
Prolonged ileus	6
Wound infection	14
Atelectasis	10
Wound dehiscence	2
Bile leak	6
Deep vein thrombosis	2

Out of 60 patients, 8 cases expired. Three cases of liver laceration, of which two patients had associated head injury, the other case had associated right sided chest injury and fractured long bone lower limb. Two patients had colonic injuries with faecal peritonitis and one patient had faecal fistula and other patient had septicaemia. Two patients had duodenal injury, of which one patient had biliary leakage. Out of 60 cases operated 8 cases expired, making a mortality of 13.3%.

V. Discussion

Majority of these patients (70 %) were in the age group of 11-40 years, which is a period of activity. Males outnumbered females, the ratio being 5:1, only 10 out of 60 patients were females. The sex ratio is 6.5:1 in Yadav et. al., series, 3:1 in Allen et.al., series and 2.7:1 in Everand et.al., series.

In our series about half of the patients sustained injury to abdomen due to road traffic accidents while Allen et.al., reported a much higher incidence due to motor accidents. Accidental fall from height, either from tree, electric pole or into well was responsible for about a third of injuries. Four patients were assaulted with blunt instruments like rods, sticks. Domestic accidents were the cause in two patients.

Most of these patients had associated injuries. About half of these cases have associated head injuries, chest injuries, spinal injuries, pelvic injuries, extremity injuries and simple soft tissue injuries. Isolated blunt injury to abdomen per se are rare, especially in patients involved in road traffic accidents. Isolated abdominal injuries are mostly due to homicidal assaults.

Majority of cases of blunt injury abdomen have more than one organ involved. Isolated liver and spleen injury can occur but more commonly associated with injuries to surrounding viscera. The number of organs involvement and the severity of these injuries, will reflect in increased morbidity and mortality of the patients.

Most of the patients with simple abdominal injuries had an average hospital stay of 10 days. Some of these patients had prolonged hospital stay in the presence of faecal fistula, bile leak, wound sepsis, wound dehiscence. Two patients of colonic injuries with colostomy, have returned back for readmission for the closure of colostomy. Most of the patients with abdominal injuries associated with other injuries had prolonged hospital stay even for 2-3 months in either orthopedic care or neurosurgical care.

Table 6: Comparison of Operative Findings with Other Studies

Organ Injured	Current study No. of cases	%	Ronald Jones & Malcom O Perry study	Hermann hospital Houston study	MIEMSS Baltimore
Spleen	16	26.67	26.2	57.7	42.2
Small bowel	14	23.33	24.2	14.0	4.7
Liver	10	16.67	15.6	44.6	35.6
Retroperitoneal hematoma	6	10	2.7	-	14.6
Colon	5	8.3	-	14.0	4.7
Mesentery	2	3.33	2.5	-	-
Kidney	2	3.33	2.42	8.4	2.7
Pancreas	1	1.67	1.4	6.2	0.02
Diaphragm	1	1.67	1.1	-	5.2
Bladder	1	1.67	-	3.8	3.2
Duodenum	2	3.33	-	6.0	0.01

It has been speculated that a higher incidence of splenic injuries with reduction in injury to other organs and associated injuries could be due to a wide spread use of seat belts in cars. Since seat belt are hardly used in our country, there is a much higher incidence of injuries to other organs as well as associated injuries.

VI. Summary

- The most common cause of abdominal injury is road traffic accident and homicidal assaults next, which are increasing in present civilian life. Majority of these accidents have occurred, when under the influence of alcohol.
- Surgeon is now facing blunt injury abdomen more frequently, than it was before. This is due to rapid transportation of patient, improvised ambulance services, improvised resuscitation at the scene of accident and during transport to hospital.
- With improved equipment in the resuscitative rooms in emergency ward in the hospital, better blood bank facilities, early diagnosis and surgery – the mortality can be brought down to minimum.
- The concepts of management have changed regarding splenic trauma and liver trauma from the past decades. There is a report of recent trend towards conservative philosophy for splenic laceration, where in there is more tendency towards splenorrhaphy, partial splenectomy and splenic auto transplantation with good results than the older splenectomy. Regarding liver laceration, instead of the older concepts of suturing liver laceration where in more harm being done due to strangulation of liver parenchyma enclosed in sutures, there is a shift recently towards ligation of individual vessels in the liver laceration and simple drainage of the bed, with less morbidity and mortality. The concepts of management of small bowel and colonic injuries, vascular injuries have not much changed since the past.
- With better resuscitation at the scene of accident, early transportation of the patients to the hospitals, early

diagnosis and early surgery and better postoperative care of the patient have totally changed the mortality and morbidity to a minimum with more patients are going from the hospital successfully and earlier.

- Owing to the increasing incidence of cases of blunt injury abdomen alone or associated with head, chest, skeletal injuries, there is a need for setting up traumatic units with a good operation theatre and a well-equipped postoperative ward in every district hospitals, so that patients can be tackled earlier in the nearest hospital, and he need not travel all way to a distant well equipped hospital.
- There is a need for research in the field of machine designing wherein improving the design of the automobiles, may reduce the incidence of road traffic accidents. Improving traffic rules, regulations and improving traffic disciplines may also be helpful in reducing the incidence of traumas. Research in the field of sociology is also necessary where in better public awareness can be made regarding ill effects of alcoholism, and bettering the behaviour and budding brotherly attitude and understanding amongst the people towards each other, may reduce the incidence of homicidal assaults.

References

- [1] Micheal J Zinner& Stanley W. Ashley. Maingot's Abdominal operations 12th Edition 2013
- [2] Neugebauer H. Wallenboeck E. Hungerford M: Seventy cases of injuries of the small intestine caused by blunt abdominal trauma: a retrospective study from 1970 to 1994. J Trauma. vol 46 (1): 116-21, 1999 Jan.
- [3] Perry, John. F. et al "Diagnostic peritoneal lavage in Blunt Abdominal Trauma"; J. Surg- Gynaec and Obst. Vol.; 72; p743-744, Oct 1970.
- [4] R. Khanna, S Khanna, P Singh, Puneet and A K Khanna; Spectrum of blunt abdominal trauma in Varanasi; Quart J; vol 35, No 1&2, Mar&Jun 1999; p25-28.
- [5] Diagnosis and management of blunt small bowel injury: a survey of the membership of the American Association for the Surgery of Trauma. 2000 Mar; 48 (3): 402-7.
- [6] DiVincenti FC, River JD, Laborde EJ, et al: Blunt abdominal trauma. J Trauma 8: 1004, 1968

Dr.Pentapati Veera Durga Rani. "Blunt Abdominal Trauma And Its Surgical Management – A Clinical Study In A Tertiary Care Unit." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 17, no. 3, 2018, pp 22-26.