



## EVALUATION OF DIFFERENT MANAGEMENT IN TRAUMATIC SOLID ORGAN INJURY IN RURAL TERTIARY CARE HOSPITAL

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### ABSTRACT

**Introduction:** Blunt abdominal trauma is a leading cause of morbidity and mortality among all age groups. The abdomen is a diagnostic black box. Blunt abdominal trauma is usually not obvious clinically and frequently unreliable. Identification of serious intra-abdominal pathology is often challenging. Missed intra-abdominal injuries and concealed hemorrhage are frequent causes of increased morbidity and mortality, especially in patients who survive the initial phase after an injury.

**Aims & Objectives:** To establish diagnosis in solid organ injury without any hollow viscous injury following blunt trauma.

**Material and methods:** The present study was a Prospective Cohort Study. This Study was conducted from 1st September, 2017 to 31st August, 2019 at Burdwan Medical College and Hospital, Burdwan, West Bengal. Total 100 patients were included in this study.

**Result:** 7 out of 9 pancreatic ductal injury patients have been surgically managed. Among the 2 ductal injury patients who have been conservatively managed, found expired after conservative treatment and one presented with pseudocyst of pancreas.

**Conclusion:** Liver injury has been surgically managed by hepatorrhaphy and absorbable gelatin sponge packing while splenic trauma can be surgically managed by splenorrhaphy and splenectomy.

**Keywords:** Blunt Trauma, Abdomen, Conservative Management and Solid Organ Injury.

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### INTRODUCTION

Blunt abdominal trauma is a leading cause of morbidity and mortality among all age groups. The abdomen is a diagnostic black box<sup>[1]</sup>. It is most usually associated with blunt trauma. Trauma can result from car accidents, falls from great heights, sports injuries, or violence<sup>[2]</sup>. Automobile accidents contribute for 75-80% of abdominal blunt trauma<sup>[3]</sup>. Assault with blunt objects, sports injuries, industrial accidents, bomb blast injuries, and falls account for 15 and 6-9 percent of all injuries, respectively. Domestic violence and child abuse can also result in acute abdominal damage. Road traffic accidents kill 1.2 million people worldwide each year (3242 people every day). By 2020, road traffic accidents are expected to be the third greatest contributor to the global disease burden.

Blunt abdominal trauma is usually not obvious clinically and frequently unreliable<sup>[4]</sup>. It is frequently difficult to identify significant intra-abdominal pathology. Missed intraabdominal injuries and hidden bleeding are common causes of increased morbidity and death, particularly in individuals who survive the early phase of an injury. A significant majority of patients do not have these injuries diagnosed at the outset. Delays in diagnosis can have catastrophic repercussions, including "preventable" fatalities. As a result, various diagnostic techniques have arisen over the last three decades, including diagnostic peritoneal lavage, ultrasonography, computed tomography (CT), and video laparoscopy, each with intrinsic benefits, drawbacks, and difficulties<sup>[5]</sup>. FAST (focused assessment with sonography for trauma) has developed as a valuable method in the evaluation of blunt abdominal injuries in recent years. FAST has the benefit of being non-invasive, portable, simple to execute, and may be done concurrently with resuscitation. Some writers suggest that FAST is more sensitive to free fluid than CT. The routine use of CT scanning for the assessment of blunt abdominal injuries was first met with skepticism. A hemodynamically stable patient is required for CT scanning. Late entrance to hospital, inadequate diagnostic facilities, and late intervention continue to have a negative impact on

outcomes in developing nations [6]. Inspire of the best techniques and advances in diagnostic and supportive care, morbidity and mortality remains at large. The reason for this could be due to the interval between trauma and hospitalization, delay in diagnosis, inadequate and lack of appropriate surgical management, post operative complications and associated especially to head, thorax, and extremities.

In view of increasing number of increased blunt trauma incident nowadays this dissertation for thesis has been chosen to study the cause of blunt abdominal trauma, its different modes of presentation and to study and compare the different modalities of management.

## MATERIALS AND METHODS

**Study design:** Prospective Cohort Study

**Study setting:** All surgical units at Burdwan Medical College and Hospital, Burdwan, West Bengal

**Study period:** 1st September,2017 to 31st August,2019

**Definition of Population:** All Blunt Abdominal Trauma Cases in the given time period admitted in all surgical units will be considered. \ Sample size: 100

**Inclusion Criteria:** The patients presenting with history of recent assault by blunt and heavy object over abdomen.

- I. Road traffic accident with suspected blunt abdominal injury
- II. History of fall from height.
- III. Injuries occurring during natural calamities like earth quakes and landslides.
- IV. Patients on whom there is clinical suspicion of blunt trauma to abdomen.
- V. Blunt trauma abdomen in sports injury.

**Exclusion Criteria:**

- I. Patients with penetrating and stab and gunshot injuries.
- II. Patients with traumatic hollow viscous perforation with or without solid organ injury
- III. Patients of blunt abdominal trauma with severe head injuries.
- IV. The patients who do not give consent for study.

**Parameters to be used:**

**Age distribution:** Any patients of blunt trauma solid organ injury

Sex distribution.

**Types of Organ Injury:** Liver, spleen, kidney, pancreas isolated injury (injury of one solid organ) or combined injury.

**Grading of injury:** grading of solid organ injury has also been noted.

**Mortality:** Mortality with respect to type of management.

**Morbidity:** Morbidity with respect to type of management.

**Post Operative Complication:** Any immediate or delayed post operative complication and temporary or permanent handicapped after surgical management.

**Hospital Stay:** Number of days in hospital staying.

## RESULT AND DISCUSSION

**Table 1: Intra-Abdominal Solid Organ Injury**

	No. of patients	%	No. of patients died/Mortality
Liver	27	29.7	3
Spleen	25	27.4	2
Kidney	13	14.3	--
Pancreas	12	13.2	5
Liver with spleeninjury	6	6.5	1
Liver with kidneyinjury	5	5.5	--
Spleen with kidney injury	2	2.2	--
Spleen with pancreas injury	1	1.1	--

**Table 2: Morbidly & Mortality with Respect to Conservative or Surgical Approach Among Pancreatic Trauma**

No. Of Patients in Various Approach	Morbidity In No. Of Patients	Mortality in No. of Patients
Conservative-5	4	1
Surgical- 7	2	4

**Table 3: Conservative & surgical approach in pancreatic trauma patients**

	Trauma without ductal involvement (No. of patients)-3	Trauma causing duct disruption (No. of patients)-9
Conservative-5	3	2
Surgical-7	0	7

**Table 4: Conservative and surgical treatment in combined liver and splenic trauma**

Approach to the patients	Total no. of patients	Morbidity (No. Of patients)	Mortality (No. Of patients)
Conservative	3	1	0
Surgical	3	1	1

**RATIO OF CONSERVATIVE TO SURGICAL TREATMENT:**

In present study around 65 % patients are subjected for conservative management. Davis et al<sup>7</sup> showed 23% and khanna et al<sup>8</sup> showed 42% non- operative management. Conservative management is gaining increasing acceptance mainly because of easy availability of FAST and CT scan. With the aid of CT scan, it is possible to accurately grade the extent of injury to solid organs like spleen, liver, kidney, pancreas. Minor lacerations and capsular tear, difficult to diagnose clinically can be demonstrated by CT scan and selected for conservative treatment. The disadvantages of conservative treatment are those of missed injuries and delayed treatment resulting in increasing mortality.

**INTRA-ABDOMINAL ORGAN INJURY:**

The incidence of solid organs involved in blunt trauma to abdomen. In our study liver is the most common organ involved while the next most common organ involved is the spleen. Mortality is highest in pancreatic trauma patients.

**DISCUSSION ABOUT SURGICAL OR CONSERVATIVE TREATMENT:**

We can see that up to grade 3 liver injury can be managed conservatively with least morbidity and mortality. Grade 4 liver injury can also be managed conservatively if clinical profile is favorable. Grade 5 liver trauma presents with high mortality.

Overall mortality and morbidity increase with increasing the grade of liver injury in spite of best possible approach.

It has been observed that up to grade 3 injury conservative treatment is the ideal one if clinical profile is favorable.

In grade 4 & grade 5 trauma splenectomy is the best possible treatment. These surgical procedures have less mortality. Although there are some instances of post operative morbidity in splenectomy patients.

Grade 4 renal trauma can be managed conservatively. Urinoma is a morbid condition which is associated with conservative treatment can be reduced by drainage of the urine radiologically. Grade 5 renal trauma may need nephrectomy after initial resuscitation of the patients. Renal trauma has no mortality.

Pancreatic trauma results with increase in mortality (41.66%) and morbidity rate 50%. Pancreatic ductal injury requires surgical management. In our study we have seen that ductal injury with conservative management comes with 100% mortality. There is delay in diagnosing pancreatic injury and this delay is probably responsible for high mortality and morbidity.

Combined solid organs injury are with single incident of mortality. That occurred in combined liver and splenic injury. After conservative treatment 56.14% of survived patients had short mean hospital stay. Higher the morbidity longer the hospital stays. Almost all surgically treated survived trauma patients got morbidity. This states surgical treatment has higher morbidity compared to conservative treatment.

We had the hypothesis that in conservative treatment the mortality is low and the alternative hypothesis is that for surgical resection the mortality is high. The P value of that study comes with 0.067 i.e., slightly better than 0.05. So that hypothesis was not statistically significant.

But in the other tables and their statistical analysis showed that P value <0.05. But the data in rest of the tables are statistically significant.

## **CONCLUSION**

This was a comparative study of 100 cases blunt abdominal trauma causing solid organ injury in Burdwan Medical College and hospital, Burdwan from September, 2017 to August ,2019. From this study, the following conclusions can be made:

- A through and repeated clinical examination and appropriate diagnostic investigations lead to successful treatment in blunt abdominal trauma patient with solid organ injury.
- FAST is a very important investigation which gives a very clear picture of solid organ injury and hemoperitoneum.
- CT scan is the ideal investigation of choice for solid organ injury. It gives the AAST grading for solid organ injury.
- In this study liver is the most commonly involved organ followed by spleen.
- Around 9 patients were died during resuscitation. That makes overall mortality 20% in BAT solid organ injury patients.
- Greater than 60% of solid organ injuries were treated by conservative approach.
- Liver injury has been surgically managed by hepatorrhaphy and absorbable gelatin sponge packing while splenic trauma can be surgically managed by splenorrhaphy and splenectomy.
- Up to grade 3 liver and splenic trauma can be managed by conservative treatment alone when there is hemodynamic stability in BAT patients.
- Grade 4,5 splenic injury are to be managed by surgical approach most of the time.
- Grade 4 liver injury can be managed conservatively in 50% of instances if there is hemodynamic stability.
- Up to grade 4 kidney injury can be successfully managed by conservative treatment with less morbidity and zero mortality.
- Pancreatic injury comes with high morbidity and mortality in both conservative and surgical treatment.
- Pancreatic ductal injury is to be managed by surgical repair; Otherwise, there is pseudocyst formation, hemorrhagic pancreatitis, sepsis even death also.
- Apart from AAST grading, hemodynamic stability is the key thing which determines whether conservative or surgical management is needed.
- If patient is hemodynamically unstable following initial resuscitation exploratory laparotomy can be done without CT scan even without FAST also.
- Conservative trend towards BAT patient comes with less morbidity and mortality.
- Renal trauma patients had zero mortality in both surgical and conservative management.
- Some patients had mortality in spite of surgical treatment as they were hemodynamically unstable and in irreversible shock. Probably this is the main reason why surgically treated patient had comparatively high mortality.
- Morbidity were SSI, UTI, RTI, urinoma formation, jaundice, pancreatic pseudocyst, acute pancreatitis etc.
- Higher the morbidity longer the hospital stays; Surgical patient had higher morbidity. Almost every surgically treated patients had morbidity.

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