

## Original Research Article

# Management of blunt trauma abdomen in a tertiary care teaching hospital: a surgical audit

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### ABSTRACT

**Background:** Blunt abdominal trauma is a common scenario in Emergency department and the common cause being road traffic accidents. With this study we present our experience with blunt trauma of abdominal solid organ injuries over a period of 12 months.

**Methods:** A retrospective study was conducted among 45 blunt trauma of abdominal solid organ injuries who presented to the emergency room of Department of General Surgery of Mysore Medical College and Research Institute, Mysore from 1st January 17 to 31st December 2017. All data were retrieved from medical records and statistical analysis was performed using Epi info version 7.

**Results:** Mean age of study population was 31.46 years. 78.2% of the patients were males. Thirty-three (73.3%) patients undergone non-operative management. Splenic injury was reported as the most common abdominal solid organ injury followed by liver.

**Conclusions:** With the advent of newer investigative modalities like contrast enhanced computed tomography (CECT) abdomen, more and more cases of blunt trauma abdominal solid organ injury can be managed non-operatively with effective ICU care. High-grade injuries do not preclude non-operative management.

**Keywords:** Blunt trauma abdomen, Liver injury, Non-operative management, Renal Injury Splenic injury

### INTRODUCTION

Blunt injury to abdomen is one of the most common injuries caused by road traffic accidents. It can also result from fall from height, assault with blunt objects, industrial mishaps, sport injuries, bomb blast etc. The rapid deceleration causes the shearing force to tear tissues at interfaces between tissues that are relatively fixed compared to surrounding structures or crush the tissues between external force and vertebral column or rapidly raise the intra-abdominal pressure from external compression causing rupture of hollow organs. Multiple organ injuries and multiple fractures are most common in blunt injury than in other types.<sup>1</sup> Many a time patients are brought to emergency department in an unconscious

stage. Clinical history and physical examinations are very important in blunt injury abdomen even though neurological impairment due to trauma itself limits evaluation.<sup>2</sup> The advent of newer imaging techniques with high resolution Computerized Tomography (CT) scanners has enabled the clinicians to exactly diagnose the extent of the intra-abdominal injuries.<sup>3</sup>

As per literature about 25% of abdominal trauma victims require abdominal exploration. With the advent of more sophisticated investigative modalities and intensive care units, a shift was found to a selective non-operative management in blunt trauma of abdominal solid organ injuries. The most common indication for operative management is hemodynamic instability. With this study

we present our experience with blunt trauma of abdominal solid organ injuries over a period of 12 months.<sup>4</sup>

**METHODS**

A retrospective study was conducted among 45 blunt trauma of abdominal solid organ injuries who presented to the emergency room of Department of General Surgery of Mysore Medical College and Research Institute, Mysore from 1<sup>st</sup> January 2017 to 31<sup>st</sup> December 2017. Those patients who had hollow viscus perforation were excluded. History of mechanism of injury and details of other injuries were noted. Basic lab investigations report and ultrasonography findings were noted. Abdominal solid injury was graded based on American association for surgery of trauma (AAST) grades using contrast enhanced CT scan of abdomen and Pelvis (CECT). Vitals (pulse rate, BP, GCS, SPO<sub>2</sub>) at presentation and clinical examination findings, hematocrit at serial intervals were documented. Details regarding pattern of treatment given also recorded. All hemodynamically unstable patients were treated operatively. Statistical analysis was done using Epi info version 7.

**RESULTS**

The youngest patient was 6-year-old and oldest person was 80 years of age with mean age of 31.46. Fifty-one percentage of patient were between age of 16-50. Age distribution of the study population is given in Table 1. The most common mode of injury was road traffic accidents (n=24) followed by fall from height (n=14) and assault.78.2% of the study population were males.

**Table 1: Age distribution of patients.**

Age group (years)	N (%) 45
1-15	14(31)
16-30	11(24.4)
31-50	12(26.6)
> 50	8(17.7)

Of the 45 cases, 5 patients were clinically unstable during presentation and underwent emergency laparotomy. Pattern of Blunt trauma of solid organs among the study population was given in Table 2.

**Table 2: Pattern of blunt trauma of solid organs among the study population.**

Organ Injury	N (%)
Splenic injury	23(51)
Liver injury	16(35.5)
Renal injury	11(24.4)
Pancreatic injury	1(2.2)

All the 12 patients (100%) who had failed conservative management received blood transfusion whereas only 18 out of 33 (54.5%) in the conservatively managed group

required blood transfusion. Maximum number of blood products used in the converted group was 6 and non-operative group was 3. Mean number of blood products in converted group was 3.2 and in conservatively treated group was 1.1.

**Table 3: Management profile of the study population.**

Organ injured	Nom 33(73.3)	Laparotomy 12(26.7)
Spleen	12(63.2)	7(36.8)
Liver	14(100)	0
Kidney	5(100)	0
Spleen + Kidney	0	4(100)
Liver + Kidney	1(50)	1(50)
Pancreas	1(100)	0

Management profile of the study population was given in Table 3. Out of 45 patients, 7 (58.3%) patients were converted to surgical management due to increase in abdominal girth and hypotension, 3 (25%) patients due to hypotension and 2 (16.6%) due to fall in Hb.

**Table 4: Distribution of parameter that influenced the conversion of non-operative management to laparotomy among study population**

Parameter	N (%)
Increase in abdominal girth + hypotension	7(15.5)
Hypotension	3(6.6)
Fall in Hb	2(4.4)

Distribution of parameter that influenced the conversion of non-operative management to laparotomy among study population was depicted in Table 4. Out of 45 cases, 14 developed complications like bronchopneumonia 7 (15%), DVT in 3 cases (6.6%) wound infection in 4 (8.8%) cases.

**DISCUSSION**

Approximately 10% of all trauma related deaths are as a result of abdominal injuries secondary to blunt abdominal trauma. Several factors are influencing the non-operative management, but selective non-operative management have served to reduce the rate of negative operative exploration and complications and this sets a new challenge with regards to observation of these patients and management of their potential complications.<sup>5,6</sup>

Majority of our patients were males, and maximum in the age group of 31-50 and mean age 31.46. The most common mode of injury was RTA, which is in concordance with the literature.<sup>7</sup> Out of 45 cases, 5 cases undergone emergency surgical exploration without CECT due to hemodynamic instability. Most common abdominal solid organ injury among present study population was splenic injury followed by liver injury. 23 patients (51%) had splenic injury and 16 (35.5%) patients had liver injury. 11 patients had renal injury (24.4%) and

one (2.2%) had pancreatic injury. These results were comparable with that in literature.<sup>8,9</sup>

Out of 45 patients with abdominal injuries, multiple intra-abdominal solid organ injuries were present in six patients (13.3%) and isolated organ injury was present in 39 patients (86.6%). Two of them had (5%) combination of liver and kidney injuries, four patients had combination of spleen and kidney injuries. Here, 14 cases of isolated liver injury all treated conservatively with 100% success rate and this was dropped to 94% when combined injury present. Isolated splenic injury that got converted was 36.8 is increased to 47.8% when combined injuries were included.<sup>10</sup>

Present study shows CECT abdomen and grading of injury has important role in non-operative management of blunt injury abdomen. Up to grade 3 injury, non-operative management have higher success rates and higher the grade higher is the chance of conversion to operative management. Similar results are shown in different studies.<sup>11,12</sup> The reason for conversion in most of the studies were reported as fall in hemoglobin, but here an increase in abdominal girth and hypotension are the main reason for conversion, followed by hypotension.<sup>5</sup> In the conservatively managed group 54.5% required blood transfusions whereas all the 12 patients (100%) who failed conservative management received blood transfusion. Mean number of blood products in converted group is 3.2 and in conservatively treated group was 1.1. In present study no cut of value for hemoglobin and decision for blood transfusion was empirical. Out of the 45 cases, 31 cases did not have any complications during the hospital stay and 14 have patients had complications. On further analysis 66.6% of operated group developed complications, where as 18.1% of conservatively managed patients developed complications. This analysis is statistically significant.<sup>13</sup>

The mean duration of hospital stay in converted group was 12 days and conservatively managed group was 11 days. The overall success rate in non-operative management of blunt abdominal solid organ injury was 95%. Morbidity was significantly higher in group that failed in NOM. Mortality was also higher in converted group. Study done in Oman by Raza M has similar findings.<sup>14</sup>

## CONCLUSION

With the advent of newer investigative modalities like contrast enhanced computed tomography (CECT) abdomen, more and more cases of blunt trauma abdominal solid organ injury can be managed non-operatively with effective ICU care. High-grade injuries do not preclude non-operative management.

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