RESEARCH PAPER

Hit Hard: Managing the Silent Impact of Abdominal Trauma After RTAs.

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ABSTRACT

Background: Blunt abdominal trauma (BAT) resulting from road traffic accidents (RTAs) represents a significant contributor to surgical emergencies, particularly in developing countries where delayed presentation and limited prehospital trauma systems increase morbidity and mortality. Early diagnosis and appropriate selection between operative and non-operative management remain critical for optimal outcomes.

Objectives: To evaluate the epidemiological profile, clinical presentation, diagnostic modalities, management strategies, and outcomes of non-penetrating abdominal trauma secondary to RTAs.

Methods: A prospective observational study was conducted in the Department of General Surgery at J.A. Group of Hospitals, Gwalior, from June 2016 to May 2020. A total of 246 patients with blunt abdominal trauma due to RTAs were included. Clinical examination, imaging modalities (ultrasonography, X-ray, and CT), laboratory investigations, and intraoperative findings were analyzed. Patients were managed either conservatively or operatively based on hemodynamic stability and injury severity. Statistical analysis was performed using SPSS v21.0, applying chi-square and Student's t-tests, with $p < 0.05$ considered significant.

Results: The majority of patients presented within 10 hours of injury (73.3%). Associated injuries included orthopedic and thoracic trauma (19.24% each). Ultrasonography identified free fluid in 42.18% and splenic injury in 17.02%, making the spleen the most commonly affected organ. Conservative management was successful in 80.02% of cases, while 19.98% required surgical intervention, most commonly for bowel perforation and splenic injury. Postoperative complications included wound dehiscence (3.70%) and surgical site infection (2.22%). Delayed presentation was significantly associated with mortality ($p = 0.0004$), and complications were significantly higher in the operative group (Fisher's exact test $p < 0.0001$).

Conclusion: Most hemodynamically stable patients with blunt abdominal trauma can be managed conservatively with imaging-guided protocols. Early resuscitation, timely diagnosis, and improved trauma infrastructure are essential to reduce preventable morbidity and mortality.

Keywords: *Hit Hard, Abdominal Trauma, BAT, RTA*

How to cite this article: Tyagi P, Verma VK, Rokde P, Singh R, Singh SP, Gupta VK, Singh SP, Hit Hard: Managing the Silent Impact of Abdominal Trauma After RTAs...Int J Drug Deliv Technol. 2026; 16(8s): 357-359; DOI: 10.25258/ijddt.16.8s.47

Source of support: Nil.

Conflict of interest: None

INTRODUCTION

Blunt (non-penetrating) abdominal trauma secondary to road traffic collisions constitutes a significant clinical entity within the spectrum of acute surgical emergencies. These injuries frequently involve multisystem trauma and necessitate rapid hemodynamic assessment, focused diagnostic evaluation, and coordinated multidisciplinary intervention encompassing general surgery, trauma, and critical care teams. The principles of trauma evaluation and management have evolved significantly, emphasizing early resuscitation, anatomical assessment, and selective operative strategies to improve outcomes [1,2].

India exhibits one of the highest global incidences of road traffic accidents (RTAs), with rural populations disproportionately affected due to delayed access to definitive trauma care and lack of structured pre-hospital emergency infrastructure. Consequently, intra-abdominal injuries in these settings are often associated with high morbidity and mortality. Knowledge of surgical anatomy and injury patterns remains fundamental for accurate diagnosis and management of abdominal trauma [3,6,7].

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This study aims to delineate the epidemiological profile, clinical presentation, and outcomes of blunt abdominal trauma, and to evaluate operative versus non-operative management strategies to inform evidence-based triage and optimize resource allocation in resource-constrained healthcare environments. Contemporary trauma care increasingly favours selective non-operative management in appropriately selected patients, guided by clinical assessment and advanced imaging modalities [4,5].

AIM:
To evaluate the clinical profile, diagnostic workup, operative and conservative management strategies, and outcomes of non-penetrating abdominal trauma due to road traffic accidents.

Primary objectives:

- To analyze the age and sex distribution of blunt abdominal trauma cases.
- To identify patterns of abdominal organ injuries.
- To assess the role of various imaging modalities in diagnosis.
- To evaluate the outcomes of operative vs conservative treatment.

Secondary objectives:

- To evaluate latent period before treatment.
- To assess associated injuries and complications.
- To determine mortality and morbidity patterns.

MATERIALSANDMETHODS:
A prospective observational study was conducted in the Department of General Surgery, J.A. Group of Hospitals, Gwalior, over 4years (June 2016–May 2020). A total of 246 patients presenting with blunt abdominal trauma were included.

Inclusion Criteria:

- Patients with non-penetrating abdominal trauma due to RTAs.
- All age groups, both genders.

ExclusionCriteria:

- Penetrating injuries
- Patients with in complete records

Data Collection: Data was collected through clinical examination, imaging (USG, X-ray,
CT), and intraoperative findings. All patients underwent routine labs and were followed until discharge or death. Conservative and operative groups were compared based on clinical signs, investigations, and outcomes.

Statistical Analysis: SPSS ver 21.0 was used. Chi-square test for categorical data and Student's t-test for continuous variables. p-value < 0.05 was considered statistically significant.

OBSERVATION AND RESULTS:

Table 1: Latent Period (in hours)

Latent Period	No. of Patients	Percentage (%)
0–5	71	28.86
6–10	109	44.44
11–15	35	14.06
16–24	13	5.18
>24	18	7.40
Total	246	100

Table 2: Associated Injuries

Type	No. of Patients	Percentage(%)
Head Injury	38	15.54
Orthopedic	47	19.24
Soft Tissue	24	13.32
Polytrauma	22	8.88
Thoracic	47	19.24
Respiratory symptoms	36	14.63

Table 3: Plain X-ray Abdomen Findings

Findings	No. of Patients	Percentage (%)
Gasunderdiaphragm	44	17.76
Softtissue shadow	24	13.32
Groundglass appearance	44	17.76
Noabnormality	104	42.18
Notdone	19	10.36

Table 4: Ultrasonography Findings

Organ/Injury Type	No. of Patients	Percentage (%)
Liver	35	14.06
Spleen	42	17.02
Kidney	35	14.06
Freefluidonly	104	42.18
Smallbowel	22	11.84

Table 5: Management Modality		
ManagementType	**No. of Patients**	**Percentage (%)**
Operative	49	19.98
Conservative	197	80.02

Table 6: Operative Procedures Performed		
Procedure	**No. of Patients**	**Percentage (%)**
Closure of perforation	25	10.36
Splenectomy	11	4.44
Mesentericrepair	11	4.44
Bladder repair	05	2.22
Resection & anastomosis	05	2.22
Nephrectomy	00	0.00
Gastric perforation repair	07	2.96

Table7: Postoperative Complications		
Complication	**No. of Patients**	**Percentage (%)**
Wound dehiscence	07	3.70
Surgicalsiteinfection	05	2.22
Respiratorycomplications	03	1.48
Pancreaticfistula	00	0.00

DISCUSSION:

This study highlights the predominance of blunt abdominal trauma from RTAs in young males, consistent with previous trauma epidemiology described in surgical literature [1,3]. The spleen emerged as the most frequently injured organ, reflecting its anatomical vulnerability and well-documented prevalence in blunt trauma scenarios [6,7].

Conservative management proved effective in 80% of hemodynamically stable patients, reflecting a paradigm shift from routine exploratory laparotomy toward imaging-guided decision-making and selective non-operative management. Advances in trauma protocols and improved understanding of injury patterns have enabled safer observation strategies in stable patients, thereby reducing unnecessary surgical interventions [2,4].

Ultrasound and CT scans were crucial in detecting injuries, stratifying severity, and avoiding negative laparotomies, aligning with modern trauma management guidelines [5].

The observed mortality rate of 7.4% was largely associated with delayed presentations and concomitant polytrauma, underscoring the critical importance of early resuscitation, timely diagnosis, and coordinated multidisciplinary care. These findings emphasize the need for improved trauma triage systems, enhanced diagnostic accessibility, and strengthening of emergency infrastructure, particularly in rural and peripheral healthcare settings, to reduce preventable morbidity and mortality.

CONCLUSION:

Blunt abdominal trauma from RTAs can be managed conservatively in most stable patients with the aid of timely imaging. Early diagnosis, prompt recitation, and improved trauma care access are crucial. Strengthening peripheral health care systems can significantly reduce morbidity and mortality associated with these often-over looked but life-threatening injuries.

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