

**Blunt Trauma Abdomen: A Clinical Study Concerning Management**Sopan Ramchandra Chougule<sup>1\*</sup>, Shivaji Janardan Wadekar<sup>2</sup><sup>1</sup>Assistant Professor, Department of General Surgery, Parbhani Medical College and R.P. Hospital and Research Institute, Parbhani, Maharashtra<sup>2</sup>Associate Professor, Department of General Surgery, Parbhani Medical College and R.P. Hospital and Research Institute, Parbhani, Maharashtra

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**Abstract:**

**Background:** One of the most frequent injuries, mostly from automobile accidents, is abdominal damage. The number of people suffering from blunt abdominal trauma has increased dramatically as a result of the quick rise in motor vehicles and their aftereffects. Two thirds to three quarters of blunt abdominal trauma are caused by motor vehicle crashes. A fall from a height, an attack with blunt weapons, sports injuries, workplace accidents, bomb blasts, and a fall while riding a bicycle can potentially cause blunt injuries to the abdomen. Blunt abdominal injuries typically go undetected. Therefore, frequently overlooked until actively sought after. Most abdominal injury cases end in death as a result of poor care. The accumulation of in-patient data from around the globe has led to a gradual rise in knowledge regarding the management of blunt abdominal injuries. This could be the result of a number of factors, including the amount of time that passes between a trauma and hospitalization, delayed diagnosis, insufficient and inappropriate surgical treatment, complications following surgery, and related trauma, particularly to the head, thorax, and limbs.

**Aim:** The aim of the study was the blunt trauma abdomen with respect to management and outcome in the hospital.

**Material and Method:** This observational study included eighty patients who had been screened using pre-established inclusion and exclusion criteria after they had presented to the Department of General Surgery with a history and presentation of blunt trauma abdomen. We acquired informed consent from each individual. Out of all the hospital admissions at this time, 80 instances had abdominal trauma in general surgery wards. The study comprised patients who were admitted and had a history of abdominal trauma, were receiving surgery, or were being treated non-operatively. A thorough medical history was taken, and the patient underwent pertinent diagnostic testing along with clinical findings.

**Results:** Twelve patients and 68 male patients made up the total of 80 instances. As indicated below, 45 patients experienced penetrating injuries, while 35 patients experienced non-penetrating injuries. One instance of both penetrating and non-penetrating violence involved fatalities brought on by extreme shock as a result of several injuries. Our study has shown that non-penetrating injuries have a low death rate. This might be the case because the majority of them only had parietal wounds. According to the current study's injury pattern, entry wounds were found in 40 (or 50.0%) of the cases in the umbilical region, right iliac, and right lumbar regions.

**Conclusion:** The overuse of motor vehicles is leading to an increase in blunt injuries to the abdomen. The attending surgeon faces a therapeutic and diagnostic conundrum because of the vast range of clinical symptoms, which can include progression to shock or no physical findings at all. In light of this, the trauma surgeon should depend on his physical findings when applying modalities such as abdominal paracentesis, USG abdomen, and X-ray abdomen.

**Keywords:** Blunt trauma abdomen, Non-operative management and Abdominal damage.

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**Introduction**

Despite its close association with humans, trauma has been referred to as the underappreciated illness of contemporary society. Trauma is the most common cause of death for people under 45 years old and the top cause of disability and death in developing nations. Global urbanization, motorization, industrialization, and changes in

socioeconomic values are occurring in many countries. India is not an exception to this evolving pattern. Owing to these shifts, traffic accidents have emerged as the world's most significant public health risk, posing one of the biggest risks to public safety and human life. When it comes to the number of fatalities from traffic accidents, India

leads the world. [1,2] A frequent surgical emergency, blunt trauma abdominal (BTA) can manifest as a single issue or as a component of polytrauma. An automobile accident on the road is the most frequent cause of blunt trauma to the abdomen. [3]

Abdominal blunt trauma may be caused by external compression, crushing, or deceleration. Among the various reasons of blunt abdominal trauma, some of the more prevalent ones are sports injuries, falls from heights, road traffic accidents, military injuries, battering, martial arts, athletics, mountaineering, etc. The most prevalent cause of blunt trauma abdomen is a car accident. Abdominal blunt trauma may be caused by external compression, crushing, or deceleration. [4,5] Trauma is one of the main causes of acute abdomen in day surgery practice because of the rising incidence of abdominal trauma. Whether or not the peritoneum's integrity has been compromised determines whether the trauma is considered penetrating or non-penetrating. Because of its unique causes and consequences, abdominal trauma can also be classified into another unique group. This is the result of invasive diagnostic and therapeutic procedures such as liver biopsies and other endoscopic procedures like laparoscopies, gastroscopies, and cystoscopies, among others, that can cause iatrogenic damage to the abdominal organs. [6,7]

Many series findings indicate that greater fatality rates are typically associated with blunt abdominal trauma. In some circumstances, it might be challenging to diagnose intra-abdominal injuries in non-penetrating trauma. This is especially true if the patient arrives in a condition of shock, unconsciousness, and many concomitant injuries, such as a chest injury, a head injury, or skeletal injuries. If the patient is prescribed narcotic analgesics or receives them in the future, the situation could get considerably more problematic.

While more advanced non-invasive methods are being developed to enable quick and precise diagnosis, these methods are still not commonly accessible. With the help of fundamental research, the diagnosis and surgical choice are mostly based on thorough and repeated clinical examinations; management needs to be tailored to the patient. [8] Surgery and other departments must work together and communicate well in order to effectively treat abdominal trauma.

Basic knowledge of radiology anesthetic, basic concepts of wound treatment shock, blood replacements, multiple kidney, bladder, chest, and blood vessel injuries, and treating mass casualties are all necessary for the management. The current standard for managing blunt trauma abdomens involved urgent examinations; but, with improved

patient monitoring made possible by noninvasive technologies, the paradigm has shifted to a more conservative and selective approach. The likelihood of nonsurgical management has grown with the development of innovative therapeutic techniques including ultrasonography, CT-guided drainage, or embolization of bleeding vessels, as well as advances in critical care management. Another crucial factor is the availability of intense monitoring. Patients who are hemodynamically unstable require urgent surgical procedures. [9] The treatment of a trauma patient is difficult and calls for efficiency, commitment, and diligence. One of the most difficult parts of acute trauma care is still evaluating and diagnosing a patient with blunt trauma abdomen. [10]

### Material and Methods

This observational study included eighty patients who had been screened using pre-established inclusion and exclusion criteria after they had presented to the Department of General Surgery with a history and presentation of blunt trauma abdomen. We acquired informed consent from each individual. Out of all the hospital admissions at this time, 80 instances had abdominal trauma in general surgery wards. The study comprised patients who were admitted and had a history of abdominal trauma, were receiving surgery, or were being treated non-operatively.

A thorough medical history was taken, and the patient underwent pertinent diagnostic testing along with clinical findings. Following the initial resuscitation and the achievement of hemodynamic stabilization, a thorough history and clinical examination were performed on each patient. Every patient had routine testing for blood and urine. The decision to proceed with additional tests, such as four-quadrant aspiration, X-ray chest and abdomen erect view, and abdominal ultrasound, was made based on the clinical results. The findings of the diagnostic tests and the clinical examination determine whether non-operative therapy or surgery is necessary. Participants in the study who had gunshot or penetrating wounds were not allowed to participate.

### After admission data of the study was collected by:

- Direct questioning of the patient or those who are close to them in order to get a thorough medical history.
- Detailed clinical assessment and pertinent research conducted, with a focus on life-saving measures.
- Clinical results and pertinent investigative reports are entered into the study-prepared proforma.

On a specially created proforma, patient data, including identity, history, clinical findings, diagnostic tests, operative findings, operational procedures, and complications during the hospital stay and the follow-up period, were documented. The results of the operation and the management strategies are documented for the patients. Patients are monitored until they are released from the hospital. The post-mortem results are recorded if the patient passes away. The length of hospital stay and post-operative morbidity were noted. A pro forma created for this study has the aforementioned information. The results of the clinical examination, the hemodynamic stability findings of the CECT abdomen, and other pertinent tests determined whether to proceed with non-surgical or operational care.

In addition to standard tests, 80 individuals had an X-ray of their abdomens. Aspiration was done in four quadrants on 70 patients. Blood aspiration was considered positive even if it did not clot. The test was deemed negative when the aspirate clotted. A total of 10 individuals had peritoneal lavage for diagnostic purposes.

Patients who had unclear symptoms or were hidden by nearby soft tissue damage underwent DPL. An infra umbilical incision was made, a baby feeding tube was inserted, ringer lactate solution was irrigated into the abdominal cavity, and aspiration was performed using a semi-open technique.

The findings of the diagnostic tests and the clinical examination determined whether to proceed with an operation or not. Patients who were determined to benefit from conservative or non-operative treatment were put on strict bed rest and underwent regular clinical examinations, which included checks of the abdomen and other systems as well as hourly blood pressure, pulse rate, and breathing rate. When necessary, appropriate diagnostic procedures—such as an abdominal ultrasound—were repeated.

**Statistical Analysis:** The results are presented in frequencies, percentages, and mean  $\pm$  SD. The Chi-square test was used to compare the categorical variables. All the analysis was carried out on the SPSS 16.0 version.

### Result

There were 68 male patients and 12 female patients out of the 80 instances. The following chart illustrates that 45 patients experienced piercing injuries and 35 patients experienced non-penetrating injuries. Deaths from extreme shock brought on by several injuries were one instance of both piercing and non-penetrating violence.

In our series of non-penetrating injuries, the death rate is determined to be low. Perhaps because the majority of individual's patients sustained parietal injuries, this is the case.

**Table 1: Distribution of penetrating and non-penetrating injuries**

Sex	Penetrating	Non-penetrating	Total
Male	56	12	68
Female	5	7	12
Total	61	19	80

In the present study, there were 68 (85%) males and 12 (15%) females. Most of them were in operative management. In total 80 cases, 45 (56.3%) are Penetrating injuries and 35(43.7%) are non-penetrating injuries.

**Table 2: Organs involved in the study**

Organs involved	No of cases	%
Stomach	18	22.5
small intestine	23	28.7
Ileum	12	15
Jejunum	6	7.5
Transverse colon	5	6.2
Caecum	5	6.2
Liver	3	3.75
Kidney	4	5
Ureter	2	2.5
Pancreas	1	1.2
Lung parenchyma	1	1.2

In the present study injury pattern showed that 40(50.0%) cases had entry wounds in the umbilical region, followed by right iliac, and right lumbar. Intra-abdominal injuries, included small intestine (n = 23, 28.7%), stomach (n = 18, 22.5%), Ileum (n = 12, 15%), Jejunum (n = 6, 7.5%), Transverse colon (n = 5, 6.2%), Caecum (n = 5, 6.2%), Liver 3(3.75%) and Kidney (n = 4, 5%). In present study there were 47(58.75%) cases of homicide, 20(25%) cases were suicide and 13(16.25%) were accidents.

**Table 3: Operative Findings and Procedure done**

<b>Operative findings</b>	<b>Number of cases</b>	<b>Percentage</b>
Jejunal/ileal perforation (Multiple through and through or involving mesentery)	20	25
Transverse colon perforation Multiple mesentery involvement	26	32.5
Liver parenchymal injury	4	5
Renal parenchymal injury	4	5
Ureteral injury	18	22.5
Gastric Perforation	4	5
Retroperitoneal Hematoma	2	2.5
Hemoperitoneum (Anterior abdominal wall bleeding)	2	2.5
	<b>80</b>	<b>100</b>

In the present study it was found that the average drain output was 60ml/day for small bowel perforation and the patient started oral feeding on POD 5, removal day of the drain was averaging the sixth day after starting orally, for hemoperitoneum post-op day, and drain.

### Discussion

Even the most skilled traumatologists find treating blunt abdominal trauma to be dangerous. Forty percent of patients with hemoperitoneum may not have any abdominal abnormalities. Occasionally, other, more noticeable exterior injuries may conceal the clinical assessment of blunt abdominal injuries. [11] Mohapatra et al.2003 [12] also reported 62% of cases of blunt injury abdomen were due to RTA. Another study by Curie et al.1964 [13] also reported 58.6% of cases of blunt injury to the abdomen were due to RTAs.

The highest number of instances in our study occurred in the third decade of life (20–30). The first forty years of life accounted for the majority of the cases. This suggests that trauma affects young people more frequently. The age range covered was 15–72 years. The mean age was forty-nine. Our study is comparable to the study by Curie et al.1964 [13] which showed a maximum number of cases in the third decade (35%). Ranging from 15-72 years with a mean age of 39 years.

In 25% of patients requiring surgical intervention, the abdomen is the third most usually affected region. There are two categories for abdominal trauma: penetrating and blunt. While problems from blunt trauma may go unnoticed if the clinical indications are not immediately apparent, penetrating abdominal trauma is quickly recognized. [14]

The necessity for a precise and quick imaging technique to evaluate related abdominal visceral injuries is explained by hemodynamic instability, altered awareness, and the occurrence of further injuries in the chest, pelvic bones, or extremities. [9]

Hardik Dodia's 2015 [15] study 6(24%) patients had jejunal injuries; followed by transverse colon, Liver, and Kidney 2(8%) cases each. No cases were associated with major thoracic vessels and the heart. J.E. Pridgen and A.F. Heriff 1967 [16] reviewed 776 cases of penetrating abdominal wounds and found colonic injuries in 15.33%, gall bladder rupture in 2.9%, and mesenteric injuries in 3.47% of cases.

Vascular injuries, involving the aorta were present in 0.5% and iliac vein in 0.64% of cases. The other injuries include- 2.57% bladder injuries, 4.12% pancreatic injuries, 13.14% stomach injuries, 22.8% liver injuries, and 21.26% small bowel injuries. Anis Uz Zaman 2000 [17], analysis of 99 cases study retrospectively reviewed the records of 99 patients and found Intra-abdominal injuries, including liver (n = 14, 17.7%), spleen (n = 12, 15.2%), kidney (n = 4, 5.1%), pancreas (n = 4, 5.1%), stomach (n = 12, 15.2%), small bowel (n = 34, 43%) and large bowel (n = 35, 44.3%).

There are several points of contention in the current body of medical literature about different facets of the care of different kinds of abdominal trauma. For instance, in the management of stab wounds, some supporters favor selective conservation while others support routinely examining all stab injuries. There is a wide range of surgical techniques for liver damage, and each of these is debatable in and of itself. Similar to splenic injuries, others advocate for a more conservative approach and different ways to save injured spleen, even though splenectomy rates are still high. [8]

Both human and mechanical resources are needed for conservative treatment in order to continuously monitor the patient. It is preferable to open and observe rather than wait and see in situations when many centers lack the facilities to continuously monitor the patient. If we do not, we risk losing the patient and wasting important time. If a patient passes away despite receiving proper and effective care—even if it is because of unrelated issues—their family may still file a complaint with the consumer redressal forum, claiming that their loved

one did not receive the necessary care, such as surgery.

Therefore, when there is a need for clinical surgery, it is preferable to open the incision and observe in situations of knife wounds and blunt abdominal damage. Some laparotomies, though, might not be beneficial. The management of duodenal and pancreatic injuries is an additional area of uncertainty. Some advocate for straightforward conservatism in the management of retro-perineal hematomas, while others strongly support routine examination of these lesions, arguing that doing so will not appreciably increase mortality or surgical time. Retroperitoneal hematomas should, in our opinion, not be routinely investigated unless there is a clear reason to do so. [10]

In general, this calls for a shift in a number of factors, including socioeconomic norms, the percentage of the population that is literate, and certain significant features of human conduct that are the primary source of violence against humans. Technically speaking, shorter travel times, strict resuscitation protocols, prompt diagnosis and surgical decision-making, high-quality radiological and blood bank facilities, careful exploration, precise surgical technique, and thorough post-operative follow-up all contribute to a lower death rate.

The most often damaged solid organs were the liver and spleen, although intestinal damage was also observed in a sizable proportion of cases. As previously said, if used wisely, the conservative strategy is safer and more effective than the surgical technique. Abdominal trauma may be prevented by strictly adhering to traffic laws, enhancing road conditions, installing pedestrian overpasses and lighting, and other measures. Patients' morbidity and death are increased when many intra-abdominal organs are involved, when extra-abdominal injuries are present, and when comorbid conditions are present.

### Conclusion

The overuse of motor vehicles is leading to an increase in blunt injuries to the abdomen. The attending surgeon faces a therapeutic and diagnostic conundrum because of the vast range of clinical symptoms, which can include progression to shock or no physical findings at all.

In light of this, the trauma surgeon should depend on his physical findings when applying modalities such as abdominal paracentesis, USG abdomen, and X-ray abdomen. It is not too difficult to identify hollow viscus perforations using an X-ray.

However, because contemporary conveniences like CT scans are not widely available in India, solid organ damage can occasionally be challenging to diagnose. Our research leads us to the conclusion

that conservative care can be attempted in hemodynamically stable patients with solid organ injury, and non-operative management is linked to a lower risk of complications and morbidity. The prognosis for trauma patients may be enhanced by prompt surgical intervention, vigorous resuscitation, and early diagnosis.

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