

Blunt Trauma to Abdomen in Rural Setup: A Multiple Case Study

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Abstract

Background: Abdominal trauma accounts for the large number of trauma-related injuries and death. Blunt abdominal trauma accounts for more than half of abdominal trauma.

Aim and Objective: The aim is to study blunt abdominal trauma in the rural area.

Materials and Methods: A prospective study of 68 consecutive cases of blunt abdominal trauma admitted to a referral hospital in a rural area over a period of 2 years were studied. Detailed history, thorough clinical examination and proper investigations were done. Once diagnosed patients were either treated conservatively or surgically.

Observation and Result: Blunt trauma to the abdomen is common in the 3rd decade of life, in males, farmers and due to road traffic accidents. The small bowel, spleen and mesentery commonly injured and mortality maximum within 1st h of admission due to hemorrhagic shock.

Conclusion: Blunt abdominal trauma is on the rise due to easy availability and use of motor vehicles, increase in crime and violence. Sono-radio diagnosis helps in arriving at conclusive diagnosis and aids in treatment. Mortality can be reduced by reducing injury-admission interval, intransit resuscitation of patient and prompt treatment.

Key words: Abdominal trauma, Blunt trauma abdomen, Laparotomy, Mortality, Non-operative management

INTRODUCTION

Since high-speed surface travel is becoming more universally available, it is certain that blunt trauma will continue to comprise an important fraction of the major injuries which the surgeon is called upon to treat.¹ Rapid resuscitation is necessary to save the unstable but salvageable patient with abdominal trauma. Accurate diagnosis and avoidance of needless surgery are an important goal of evaluation. "As the surgeon directs these activities he must seek the answers to two questions. First, does the patient need an abdominal operation? Second, will the patient tolerate the time required for diagnostic maneuvers before surgery is

performed?"² However, most avoidable deaths result from failure to resuscitate and operate on surgically correctable injuries.³

Among the signs, Rob's dictum⁴ (1947) was useful, "The absence of peristaltic sounds, confirmed and reconfirmed is a positive indication for laparotomy, but the presence of peristaltic sound is only a valuable guide toward and not a positive indication for conservative management."

When the diagnosis is in doubt, and clinical judgment suggests surgery, exploration provides definitive treatment as well as a diagnosis; moreover, the risks of negative exploration have become acceptable.^{5,6} In 1940, Gray Turner gave valuable advice to that undertaking laparotomy for closed abdominal injuries as follows: "The patient will not die from a very big incision, but may very likely succumb if some important injury is overlooked."⁷ Hence, the new techniques and diagnostic tools available are important in the management of abdominal trauma, especially blunt trauma. These improved methods and

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diagnostic tools, however, still depend on availability in rural area, experience and clinical judgment for application and determination of the best care for the injured patient.

Aims and Objectives

1. To study the etiology of blunt abdominal trauma in this area.
2. To study different organs injured when a person sustains blunt trauma to the abdomen.
3. To study mortality in relation to various factors.

MATERIALS AND METHODS

A prospective study of 68 consecutive cases of blunt trauma to abdomen admitted to a tertiary hospital in a rural area over a period of 2 years was studied in detail.

Institutional Ethical Committee approval was also taken before starting the study.

Detailed history, time of injury, type of injury, cause of injury, site of injury over the abdomen, injury to admission interval was noted. So also size of vehicle, position of patient and type of impact was noted in road traffic accident. Thorough clinical examination was carried out in all patients. Routine blood and urine examinations were done. Special blood investigations, plain X-ray erect abdomen, ultrasonography (USG) of the abdomen, X-Ray chest, spine, pelvis, intravenous pyelogram, computed tomography (CT) scan were done as required. Patients in shock were resuscitated initially. Line of treatment was then decided upon whether conservative or operative. When there was rising pulse rate, increasing abdominal distention and tenderness, patients were shifted onto the surgical line of treatment.

Results were computed as percentages of total participants. Furthermore, data were internally compared for age and gender, and outcomes were also compared accordingly and was tabulated.

OBSERVATION AND RESULT

Age/Sex

The maximum incidence of blunt abdominal trauma was seen in the 3rd decade (21-30 years) of life. The youngest patient was 2½ years old, while oldest was 63 years old. In the series by Currie, their patients varied from 3 years to 63 years of age.⁸ This was followed by 2nd and 4th decade of life (Table 1). Male preponderance was seen. We had 64 (94%) male patients of blunt abdominal trauma while only 4 (6%) females had blunt abdominal trauma in our study.

Occupation

Blunt abdominal trauma was most commonly seen in farmers (21 patients - 30.88%) and was closely, followed by students (18 patients - 26.47%).

Mode of Injury

The most common cause of blunt abdominal trauma was road traffic accident (59%). Similar findings were observed by Jolly *et al.* in their study of blunt abdominal trauma in G. R. Medical College, Gwalior, Madhya Pradesh⁹ (Table 2).

Interval between Trauma and Admission

About 70% patients presented to the hospital within 4 h of trauma. Earliest were two patients who came to the hospital within 15 min while one patient got admitted after 4 days.

Clinical Presentation

Of the 68 patients, 6 were unconscious, and all of the remaining 62 patients had pain in the abdomen as the chief symptom. Other clinical presentations were the retention of urine, distention of the abdomen, vomiting, hypotension, constipation, and hematuria (Table 3).

Diagnosis

This process was confirmed by erect X-ray abdomen and USG abdomen. Gas under diaphragm was the most common finding on X-ray, while the collection in the abdomen was the most common finding on USG.

Mode of Treatment

The 49 patients (72%) were treated conservatively while the rest required surgical intervention.

Table 1: Age distribution in blunt trauma to abdomen

Age range (years)	Blunt abdominal injury	
	No. of cases	Percentage
0-10	9	13.3
11-20	12	17.6
21-30	20	29.5
31-40	12	17.6
41-50	7	10.3
51-60	7	10.3
61-70	1	1.4
Total	68	100

Table 2: Comparative analysis of causes of blunt abdominal trauma

Causes of blunt abdominal trauma	Jolly series % of patients	Present series % of patients
Vehicular accident	43	59
Fall from height	23	26
Striking of heavy object	17	3
Kicks/blows/lathi/stick	12	6
Miscellaneous	5	6

Viscera Involved in Blunt Abdominal Trauma

Of 68 patients, 29 had intra-abdominal injury or perforation. Small bowel is the most commonly injured hollow viscus. The spleen is the most commonly injured organ and mesentery was the commonly injured intra-abdominal soft tissue in this study (Table 4).

Blunt Abdominal Trauma and Associated Extra-abdominal Injuries

About 53% patients of blunt abdominal trauma showed associated injuries. Head injury was an associated injury in 22 patients while chest trauma was seen in 14 cases.

Blunt Abdominal Trauma and Hospital Stay

Minimum hospital stay was 1 day while the maximum hospital stay was 32 days, with an average hospital stay of 8 days.

Blunt Abdominal Trauma and Mortality

The most common cause of mortality was hemorrhagic shock. Of 68 patients, 10 died (14.7%). Of these 6 patients died within an hour of admission during resuscitation itself. Mortality was very high in whom, head or head and chest injury was present in addition to blunt abdominal trauma. The most common cause of death is hemorrhage and shock.

DISCUSSION

Abdominal trauma continues to account for a large number of trauma-related injuries and death.¹⁰ Blunt abdominal

trauma is on the rise because of easy availability and use of motor vehicles, increase in crime and violence. Blunt abdominal trauma accounts for more than half the cases of abdominal trauma here. So does study done by Williams and Zollinger (Kennedy)¹¹ on 200 cases of abdominal trauma. The study was done at Massachusetts General Hospital also showed similar findings.¹² Blunt abdominal trauma was commonly seen in the 3rd decade of life, in farmers and had a male preponderance. This is because males are more exposed to outdoor activity and farming while women are still the homely type in a rural area like ours. Road traffic accident is the commonest cause of blunt abdominal trauma. Motor vehicle accidents (75%) and urban violence are the leading cause of blunt and penetrating abdominal trauma to this area of the body.¹³ The danger of visceral or fatal hemorrhage in blunt abdominal trauma makes it one of the most important types of trauma and one for which the doctor's decision as to the early correct diagnosis and proper early intervention may be the difference between life and death for the person concerned.¹¹ During this study, eight patients came in shock. All were promptly resuscitated in the surgical ICU but six patients expired in spite of all our efforts within 1 h of admission. Diagnostic accuracy of the erect X-ray abdomen was 100%. So in rural areas, it is a valuable and simple non-invasive investigation which still holds on its own in this era of CTs and magnetic resonance imaging (MRI). As many as one-third patients with an initial benign abdominal examination will require emergency laparotomy.¹⁴ In our study, 28% patients underwent laparotomy. Laparotomy was carried out to locate and repair injured viscera/organ, inspect abdominal cavity for other injuries, clean peritoneal cavity and control contamination and also to give the patient a definite treatment. Small bowel is the most commonly involved viscera in blunt abdominal trauma.^{15,16} So also in our study. The spleen is the most commonly injured organ. Splenic injuries may be life-threatening even in the patient who appears hemodynamically stable with missed intra-abdominal injuries a leading cause of preventable death in trauma patients.¹⁷ Rapid, the initial diagnosis of splenic injuries is, therefore, crucial. Unfortunately, splenic injuries may be subtle and present without abdominal pain or tenderness even in the alert non-intoxicated patient.¹⁸⁻²⁰ Both the liver and spleen are protected from blunt injury by the lower chest wall. The presence of lower rib fractures may, therefore, suggest injury to the liver or spleen.²¹ Associated trauma to head and chest and hemorrhage were the commonest cause of mortality.

Table 3: Clinical presentation seen in blunt abdominal trauma

Clinical presentation	No. of blunt trauma cases
Pain	62
Retention of urine	29
Distention	26
Vomiting	20
Hypotension	18
Hematuria	10
Constipation	12

Table 4: Internal injury seen in blunt abdominal trauma

Involved hollow viscus/solid organs/soft tissues	No. of cases
Stomach	2
Small bowel	4
Large bowel	3
Urinary bladder	2
Urethra	1
Liver	2
Spleen	8
Kidney	1
Pancreas	1
Mesentery	5

CONCLUSION

- Blunt abdominal trauma is on the rise.
- Blunt trauma to the abdomen is common in the

3rd decade of life, in males, farmers and due to road traffic accidents.

- Sono-radio diagnosis helps in arriving at a conclusive diagnosis and aids in treatment in the rural area.
- The small bowel, spleen, and mesentery are commonly injured in blunt abdominal trauma.
- Mortality is commonly due to hemorrhagic shock and is seen more if associated head and chest injuries are present.
- Early admission, intransit resuscitation, diagnosis and prompt and appropriate treatment can save lives.

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