

Evaluation, Management, and Hospital Outcome of Cases Presented with Blunt Abdominal Trauma to Rozhalat Emergency Hospital, Erbil, Iraq

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Abstract

Background: Abdominal trauma, both penetrating and blunt, is a major public health concern worldwide. Trauma, especially abdominal trauma is increasing due to urbanization and industrialization including road traffic accidents. To decrease morbidity and mortality rate from intra-abdominal organ injury as a result of blunt abdominal trauma (BAT), physicians have to have a high suspicion of organ injury in any case presented with BAT because any delay in the diagnosis conversely affects the prognosis of the patient. **Objective:** The aim of this study was to determine the number of patients who had surgical operative intervention because of BAT, to investigate the mortality rate among patients with abdominal trauma, and to determine the hospital outcome of BAT. **Materials and Methods:** This was an observational retrospective study of 60 cases during 1-year duration (2016–2017) at Rozhalat Emergency Hospital, Erbil, Kurdistan region of Iraq. **Results:** 48 cases were (male 80%), 12 were (female 20%), with a male to female ratio of 4:1, and the mean age was 24.80. Majority of cases (36/60) were managed conservatively, while 24 cases had surgery. The overall majority of cases (50/60) had a good outcome discharged home safely but 10 cases died. The most common intra-abdominal organ injury was the spleen. **Conclusions:** Most cases were managed conservatively, with overall mortality rate of 16.7%, all the mortality (10/60) was among the operated cases (24/60) cases.

Keywords: Abdomen, blunt, conservative, traffic accident, trauma

INTRODUCTION

Blunt and penetrating traumas are the two classified types of abdominal trauma. Assessment and management are modified accordingly, blunt abdominal trauma (BAT) injuries often managed conservatively, for those cases who are severely injured, interventional radiology and surgery may be indicated.^[1]

Anatomically, the abdomen is the part of the trunk which is located between the thorax and the pelvis. The abdomen is surrounded by the musculoaponeurotic walls anterolaterally, the muscles of the pelvis inferiorly, and the diaphragm superiorly.^[2] Internally, the three distinct areas of the abdomen are the peritoneal cavity, retroperitoneal space, and pelvic cavity.

The peritoneal cavity divides into upper and lower; the upper peritoneal cavity which is covered by the lower aspect of the bony thorax includes the diaphragm, liver, spleen, stomach,

and transverse colon. The lower peritoneal cavity contains the small bowel, parts of the ascending and descending colon, the sigmoid colon, and in females, the internal reproductive organs.^[3]

Retroperitoneal space contains the abdominal aorta; the inferior vena cava; most of the duodenum; pancreas; kidneys and ureters; the posterior aspects of the ascending and descending colons; and the retroperitoneal components of the pelvic cavity. The pelvic cavity is essentially the lower part of the retroperitoneal and intraperitoneal spaces. It contains

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Submitted: 15-Dec-2020

Accepted: 27-Dec-2020

Published : 26-Jun-2021

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How to cite this article: Mohammed HF, Yousif OS, Ismaeel SM. Evaluation, management, and hospital outcome of cases presented with blunt abdominal trauma to rozhalat emergency hospital, Erbil, Iraq. Med J Babylon 2021;18:107-10.

Access this article online

Quick Response Code:



Website:
www.medjbabylon.org

DOI:
10.4103/MJBL.MJBL_97_20

the rectum, bladder, iliac vessels, and in females' internal reproductive organs.

The tolerance of the internal abdominal organs against external forces is limited; tissue disruption as a result of blunt trauma occurs when these forces overcome the tissue tolerance as in crushing, compression movement of organs within the body, and fall from height (FFH).^[4]

BAT is a leading cause of morbidity and mortality among all age groups.^[5] It is a supreme challenging presentation to the emergency physician. The clinical features may be obscured if the patient has associated head injury, alcohol, and other toxins. Because of its difficulty in the diagnosis and its association with severe trauma to intra- and extraabdominal organs, the BAT is more dangerous and has a higher risk of mortality than penetrating injury.^[6] You have to consider splenic and liver injury in lower chest injury.^[4]

The aim of this study was to determine the prevalence of patients who had surgical operative intervention because of BAT, to investigate the mortality rate among patients with BAT, and hospital outcome of BAT.

MATERIALS AND METHODS

Study design and patients

This study is an observational retrospective study, done in Rozhalat Emergency Hospital (REH), Erbil, Kurdistan region, Iraq. REH is one of the main emergency hospitals in Erbil governorate. The hospital acts as a tertiary center for trauma, surgical, and other medical emergencies. Data were collected from February 2016 to February 2017. Sixty consecutive cases of BAT were recorded. The only exclusion criteria were penetrating abdominal injuries. The following data were collected:

- Age: No exclusion criteria for age and to detect the more age group which was involved
- Gender: Male or female
- Date of admission: Detect the day of admission because we want to record 60 consecutive cases from February 2016 to 2017
- Any past medical, surgical, or drug history
- In hospital management, either conservative or operated
- Detecting the intra-abdominal organ which was injured
- In hospital outcome, either discharged safely or died
- Time of death, preoperative, during operation, or postoperatively
- Associated EAO injuries: Orthopedic, thoracic, or brain injury. Orthopedic injury includes upper and lower extremity and rib fractures. Thoracic includes hemothorax, pneumothorax, or lung contusion and brain includes hemorrhage, contusions, and any other injuries
- Mechanism of injury such as road traffic accident (RTA), FFH, or others such as bicycle, fighting, and games
- Blood pressure (BP): To detect the stability of the patient, vitally, and hemodynamically. BP 100 mmHg and more regard as stable patients, while BP <100 is unstable

- Pulse rate: To detect the heart rate as tachycardia regarded as the first sign of shock
- Diagnostic methods: the main diagnostic tools in our hospital are ultrasound, X-ray, and computed tomography scan
- Patients with peritonitis or shock (systolic BP of <100) on initial clinical evaluation underwent laparotomy after resuscitation without further investigation
- Patients with blunt injury and no clinical features of peritonitis underwent repeated clinical assessment. Those with equivocal signs underwent computed tomography.

Statistical analysis

After collecting the data, all data were entered and coded using Microsoft Excel and analyzed with Statistical Package for the Social Sciences version 22 (SPSS, IBM Company, Chicago, IL 60606, USA). The result will be compared between patients with different variables, with a statistical significance level of < 0.05. The results will be presented as rates, ratios, frequencies, and percentages in tables and figures. *T*-test and Chi-square test were performed to compare between the groups.

Table 1: Age distribution of the patients

Descriptive statistics						
Variable	<i>n</i>	Range	Minimum	Maximum	Mean	SD
Age	60	88	2	90	24.80	17.83

SD: Standard deviation

Table 2: Mechanism of injury

MOI	Outcome		Total, <i>n</i> (%)
	Discharged safely, <i>n</i> (%)	Died, <i>n</i> (%)	
RTA	24 (48.0)	6 (60.0)	30 (50.0)
FFH	14 (28.0)	4 (40.0)	18 (30.0)
Others	12 (24.0)	0	12 (20.0)
Total	50 (100.0)	10 (100.0)	60 (100.0)

MOI: Mechanism of injury, RTA: Road traffic accidents, FFH: Fall from height

Table 3: In-hospital management of unstable patients

Unstable patients	Frequency (%)
Valid	
Conservative	4 (25.0)
Operated	12 (75.0)
Total	16 (100.0)

Table 4: Diagnosis of blunt abdominal trauma cases

Diagnostic modality	Frequency (%)
Clinical	6 (10)
US and X-ray	2 (3.3)
US and CT	32 (53.3)
US and clinical	20 (33.3)

US: Ultrasound, CT: Computed tomography

Ethical consideration

The study was conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki. Permission to access patient data was obtained from the hospital manager and this study was granted ethical clearance by the Ethical and Research Committee of Kurdistan Board of medical specialties (No. 43/17th January 2016).

RESULTS

Age and gender distribution

In this study the age range was 2-90 years old, with the mean age of 24,80(standard deviation is 17,83). Patient aged between (20-40) years were most commonly injured group. Majority of cases were male(no.48) 80%. And 20% of cases were female (no.12). Male to female ratio is 4:1. Table 1.

Mechanism of injury

The mechanism of injury in our study includes: RTA 50%(30 out of 60), FFH 30% (18 out of 60 cases), and others 20%(12 cases) Table 2.

Intra-abdominal organ injury

In general, the most commonly injured intra-abdominal organ was the spleen (26 cases in 60 cases, 43.3%), followed by the liver (16 cases in 60 cases, 26.7%). The most common intra-abdominal organ injury in conservatively managed patients also was the spleen (20 cases), followed by the liver (12 cases).

Conservative versus operative management

In terms of management, 36 cases were treated conservatively, while 24 cases were treated with surgical intervention.

On the conservative side of the patients (34 cases) were hemodynamically stable except for 4 cases. While 12 cases (50%) on the intervention side were hemodynamically unstable. The unstable patients who were treated conservatively did very well and all were discharged safely home. However, among the operated unstable patients, only 4 cases (25%) were discharged safely, but 8 patients (75%) have died.

Hemodynamic instability

Haemodynamic instability: regarding stability of the patients, 16 out of 60 cases were vitally and hemodynamically unstable, i.e in shock state Table 3.

Extraabdominal organ injury

Eighteen cases of 60 have EAO injury including, orthopedic injuries 4, brain injury 4, thoracic plus brain 2, and orthopedic plus thoracic 2.

Diagnosis of blunt abdominal trauma cases

Diagnosis of BAT cases: BAT was diagnosed through different diagnostic modalities, which included: the data analysis of the diagnostic tool was as follow: 6 (%10) cases were diagnosed just by clinical examination. US together with plain film were used for diagnosis of 2 cases (3,3%) Table 4.

Mortality rate

The overall mortality of BAT in this study was 16.7% (10 out of 60 cases). Interestingly, there was no mortality among the conservative managed group, while the mortality rate among in operative cases was 41% (10 cases among all 60 cases). Majority of cases died intraoperatively (8 out of 10), and 2 postoperatively.

DISCUSSION

BAT is any nonpenetrating trauma to the abdomen. Blunt injuries have a higher rate of mortality than penetrating injuries because in most times, they are associated with severe multiple intra-abdominal organ injuries and extraabdominal system injuries.^[6]

In this study, patients aged 20–40 were the most commonly injured group similar to other previous studies in India, Durban South Africa, and Egypt,^[7-9] thus BAT tends to affect younger patients.

This study shows that BAT is more common among males with a rate of 80% and male-to-female ratio of 4:1, consistent with other researches in Sweden and Egypt.^[9,10]

The overall mortality for BAT was 16.7%; this is higher in comparison to researches in Egypt and Kashmir.^[9,10]

This can be explained by the hemodynamic instability of the patients who died as were all vitally and hemodynamically unstable. Hemodynamically unstable patients with BAT undergoing emergency laparotomy have a high mortality upto 56%.^[9]

Another reason may be due to more severe injury, although there was no any documented severity score for the patients. Substandard prehospital care also contributes to a higher mortality rate for BAT as there is no standard prehospital care in the local health system. Lack of senior cover and advanced training for junior doctors in trauma management would also lead to a higher mortality rate in this study.

Conservative management of BAT was found to be highly successful in the treatment of the patients in our hospital. Conservative management depends on clinical and hemodynamic instability. In those who were managed conservatively, repeated follow-up and assessment is indicated.^[11]

In our study, 60 cases were recorded during February 2016–2017 in Rozh-halat Emergency Hospital (REH). Thirty-six cases (60%) were managed conservatively and all (100%) were discharged safely. Several high-quality prospective and retrospective studies have shown nonoperative management of solid organ injury to be safe and effective, and this strategy is now accepted into mainstream practice.^[12,13]

In this study, RTA is the most common mechanism of injury (50%) for BAT, FFH 30%. This was concordant with other studies in India and Egypt,^[7,9] in which RTA was the predominant.

Diagnosis of BAT cases in our study has been dependent on the clinical condition of the patient, those who were

vitality and hemodynamically stable are diagnosed by more than one type of investigation modality, but who were unstable, the diagnosis was done at most time just by clinical examination and/or focused assessment with sonography for trauma scan.

Regarding laboratory investigations for the diagnosis of BAT in our study, after observing all the documented data on the patients' files, it states that the physicians were not rely on the laboratory blood investigations in the diagnosis of BAT, because it is not specific and may be time-consuming.^[5]

CONCLUSIONS

From the current study, the following can be concluded. Patients aged between 20 and 40 years were the most commonly injured group for BAT. RTA is the most common mechanism of injury. The spleen is the most common IAO injury, followed by the liver. The mortality rate is 16.7%. Most cases were managed conservatively (60%), while the other 40% were managed by surgical intervention.

Limitations

Small sample size, because the time is limited, on the other side many cases left our hospital on their responsibility to the private hospital, and these cases were not recorded in our research. And this may because the patient were not happy with our government hospital service. Furthermore, recorded data were also limited, as still we depend on the data that recorded on the files.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest

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