

## Case Report

# Blunt abdominal trauma in Sanglah Hospital Bali, Indonesia: a study of 65 cases

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### ABSTRACT

Abdominal trauma is a challenge for every surgeon, whether related to diagnosis or treatment. In developing countries, the number of traumatic events associated with death makes it necessary for a study to be carried out to see the patterns and damage caused by abdominal trauma and the organs involved. Material and Method is all patients with blunt trauma of the abdomen who came to emergency unit Sanglah Hospital Bali, from January 2017 up to May 2018 that undergo laparotomy exploration were enrolled, the data were collected retrospectively using patient medical records. Results is 65 patients with blunt abdominal trauma came to the emergency department and undergoes laparotomy exploration, range of age was 4-74 year old and 75.3% of them were men. The most common injured organs were spleen and liver, both are 26 and 15 cases (40 and 23%). Another intraoperative finding are Ileum Perforation (10 cases) Left Zone II Retroperitoneal Haematoma (7 cases), and Mesenterium Rupture (5 cases). Splenectomy was the most performed procedure (26 cases). The most common cause of blunt abdominal trauma was motor vehicle accident. Hypovolemic shock was the most common clinical presentation (48 patient). The Conclusions are according to this study, men consisted 75.3% cases of blunt abdominal trauma and the range age of patients was 4-74 year old. The most common cause was motor vehicle accident. Among patients with intra-abdominal organ damage, spleen and liver were most commonly involved. About 84.6% of all patients with blunt abdominal trauma were discharged without complication and morbidity.

**Keywords:** Abdominal trauma, Blunt trauma abdomen, Hypovolemic shock, Laparotomy, Spleen rupture, Splenectomy

### INTRODUCTION

Today, trauma is still the main cause of mortality and morbidity. Abdominal trauma in particular is still a very common thing. The active and productive population groups are the ones most often involved and cause huge economic losses to the community.<sup>1</sup>

The incidence of blunt abdominal trauma increases over time. This is caused by the increasing number of vehicles, industrial developments, and trauma from traffic accidents. Trauma often involves young age, or the third decade of life in their lives. More common in men than women, and the main cause is traffic accidents. There are also other causes such as violence, fighting, and sports.<sup>1-3</sup>

Common signs of blunt abdominal trauma are hypovolemic shock with tachycardia, abdominal pain, and signs of peritonitis. On physical examination we often find brush and pain in the abdomen. History, physical examination, and laboratory and radiological tests play an important role in the diagnosis of blunt abdominal trauma. Ultrasound is used as an early diagnosis to detect free fluid in the abdomen and pelvic cavity. CT scan, and DPL can also be done, and laparotomy is definitive therapy.<sup>3,4</sup>

The main initial treatment in each trauma patient is to use the ATLS principle. Indications/predictors for laparotomy are haemodynamic instability, evidence of peritonitis, to achieve control of haemorrhage and control of spillage, traumatic diaphragmatic injury with herniation, severe solid organ injury (e.g. kidney and spleen), mesenteric tear/s, unexplained moderate to large amounts of free fluid (200-500mls), and failed non-operative management.<sup>2,5</sup>

**CASE REPORT**

A retrospective study of 65 consecutive cases of blunt trauma to abdomen admitted to Sanglah hospital and undergoes exploration laparotomy in over a period 1 years 5 month was studied in detail. Detailed history, time of injury, cause of injury, site of injury over the abdomen was noted. Thorough clinical examination was carried out in all patients. Routine blood examination was done. plain X-ray abdomen, ultrasonography (USG) of the abdomen, X-Ray chest, spine, pelvis, computed tomography (CT) scan were done as required. Patients in shock were resuscitated initially. This study was a descriptive study, between January 2017 until May 2018. Information extracted from records of patients with blunt abdominal trauma and undergoes exploration laparotomy at emergency operating theatre Sanglah Hospital, Bali. Variables of the research: Age, sex, mechanism of injury, damaged organ, clinical sign and symptoms, performed procedures, associated extra-abdominal injuries, and outcome.

**Age/sex**

Sex: Among the 65 patients, 49 patients (75.3%) were male and 16 patients (24.7%) were female.( Table 1)

**Table 1: Sex distribution on blunt abdominal injury.**

Sex distribution	No.	%
Male	49	75.3
Female	16	24.7

Age: Among the 65 patients, 4 patients (6.1%) were under 10 years, and 14 patients (21.5%) were between 11-20 years.

Thirteen patients (20%) aged 21-30 years, fourteen patients (21.5%) aged 30-40 years. Nine patients

(13.8%), aged 41 to 50 years and five patients (7.6%) had 51-60 years of age, 5 patients (7.6%) were between 61-70 and one patients (1.5%) were 71-80 (Table 2).

**Table 2: Age groups of patients on blunt abdominal injury.**

Age groups	No.	%
0 - 10	4	6.1
11 - 20	14	21.5
21 - 30	13	20
31 - 40	14	21.5
41 - 50	9	13.8
51 - 60	5	7.6
61 - 70	5	7.6
71 - 80	1	1.5

**Mechanism of injury**

In this study, motor vehicle accident was the most frequent mechanism of blunt abdominal trauma with 87.6% (57out of 65 patients). Followed by fall from height and pedestrian involved was the least frequent mechanism of blunt abdominal trauma (2 patients) (Table 3).

**Table 3: Causes of abdominal blunt trauma.**

Causes of abdominal blunt trauma	No. of cases
Motor vehicle accident	57
Fall from height	6
Pedestrian	2

**Intraoperative finding**

Among the 65 patients, the most damaged organs were spleen and liver (found 26 and 15 cases). Ileum perforation was in 10 patients and Left Zone II Retroperitoneal Haematoma was in 7 patients. Mesenterium rupture and Zone III Haematoma had occurred in 5 cases, Right Zone II Retroperitoneal Haematoma in 4 cases, Left Kidney Haematoma, Mesenterial Haematoma and Spleen Rupture (group I-II) were seen in 3 cases. (Table 4)

**Clinical presentation**

Of the 65 patients, 48 patients were had hypovolemic shock, 16 patients had pain in the abdomen or peritonitis as the chief symptom. Other clinical presentations were the retention of urine (Table 5).

**Performed procedures**

Twenty six patients were performed Splenectomy during the laparotomy, 13 patients undergo hepatorrhapy, 8 patients performed ileum resection and anastomose, 4 patients performed mesenterium primary hecting, and 3 patients treated by liver packing (Table 6).

**Associated extra-abdominal injuries**

Chest trauma were the most common associated extra-abdominal injuries in 65 patients, Multiple ribs fracture were most common cases (8 cases), followed by lung contusion, haematothorax (8 cases) and pneumothorax (4 cases). Head injury, maxillofacial fracture and ramus pubis fracture were seen in 4 cases (Table 7).

**Table 4: Intraoperative finding on blunt abdominal injury.**

Intraoperative finding	No. of cases
Spleen rupture (gr IV-V)	26
Liver rupture	15
Ileum perforation	10
Left zone II retroperitoneal haematoma	7
Mesenterium rupture	5
Zone III haematoma	5
Right zone II retroperitoneal haematoma	4
Left kidney haematoma	3
Mesenterial haematoma	3
Spleen rupture (gr I-II)	3
Mesocolon haematoma	3
Right kidney rupture	2
Left kidney rupture	2
Bladder rupture	2
Caecum laceration	1
Omental laceration	1
Transversal colon laceration	1
Sigmoid laceration	1
Sigmoid mesocolon rupture	1
Caecum perforation	1
Gaster perforation	1
Colon haematoma	1
Jejunum perforation	1

**Table 5. Clinical presentation on blunt abdominal injury.**

Clinical presentation	No. of cases
Hypovolemic shock	48
Abdominal pain and peritonitis	16
Urine retention	1

**Length of Hospital Stay**

Fourty patients had length of hospital stay under than ten days, followed by 11-20 days (17 patients) (Table 8).

**Blunt abdominal trauma and mortality**

The most common cause of mortality was hemorrhagic shock. Of 65 patients, 10 patients died. Mortality was very high in whom, head or head and chest injury was present in addition to blunt abdominal trauma. Blunt Abdominal Trauma and Complications during Treatment.

Excluding early deaths in the operating room, most complications and subsequent deaths following injury will occur in the ICU.

**Table 6: Performed procedure on blunt abdominal injury.**

Performed Procedures	No. of cases
Splenectomy	26
Hepatorrhaphy	13
Ileum resection + anastomose	8
Mesenterium primary hecting	4
Liver packing	3
Spleen tampon	2
Nefrectomy (D/S)	2/1
Sistostomy/bladder repair	1/2
Ileum exteriorisation	1
Primary hecting sigmoid laceration	1
Priamary hecting jejunum laceration	1
Primary hecting of mesocolon	1
Protective ileostomy	1

**Table 7: Associated extra-abdominal injuries.**

Associated injury	No. of cases
Multiple ribs fracture	8
Lung contusion (D/S)	6/2
Haematothorax (D/S)	5/3
Pneumothorax D	4
Brain swelling	4
Maxillofacial Fracture	4
Fracture of ramus Pubis	
- Superior (D/S)	2/4
- Inferior (D/S)	-/3
Closed fracture femur (D/S)	3/3
Fracture basis cranii	3
Sub arachnoid haemorrhage	3
Fracture of clavicle (D/S)	3/3
Pelvic ring injury	2
Contusio haemorrhage	2
Nasal Fracture	2
Intra ventricular haemorrhage	1
Epi dural haematome	1
Sub dural haematome	1
Intra cranial haemorrhage	1
Fracture os frontal	1
Fracture of ulna	1
Fracture of patella (D/S)	1/-
Fracture of acetabulum (D/S)	1/1
Hip dislocation (S)	1
Fracture galeazzi (D)	1
Fracture of humerus (D)	1
Tibia fracture (D/S)	1/1
Fibula fracture (D/S)	-/1
Urethral rupture	
- Pars membranacea	1

**Table 8: Length of hospital stay on blunt abdominal injury.**

Length of hospital stay	No. of cases
1 - 10 days	40
11 - 20 days	17
21 - 30 days	4
31 - 40 days	4

**Table 9. Trauma and mortality on blunt abdominal injury.**

Mortality	No. of cases
Outpatient	55
Died cause by direct trauma or complication	10

**Table 10. Complications during treatment.**

Complications during treatment	No. of cases
Pneumonia with or without sepsis	7
Stress ulcer	2
Prolong intubation and tracheostomy	2
Burst abdomen	2

Care in the ICU is designed to reestablish normal homeostasis and minimize complications of primary, secondary, and iatrogenic injury. But despite getting ICU treatment, some treatment complications still persist, among others were Pneumonia, stress ulcer, prolong intubation and tracheostomy, also burst abdomen (Table 9).

#### ***Blunt abdominal trauma and complications during treatment***

Excluding early deaths in the operating room, most complications and subsequent deaths following injury will occur in the ICU. Care in the ICU is designed to reestablish normal homeostasis and minimize complications of primary, secondary, and iatrogenic injury. But despite getting ICU treatment, some treatment complications still persist, among others were Pneumonia, stress ulcer, prolong intubation and tracheostomy, also burst abdomen (Table 10).

## **DISCUSSION**

The incidence of blunt abdominal trauma increases over time. This is caused by the increasing number of vehicles, industrial developments, and trauma from traffic accidents.

The present study was an attempt to assess the pattern of blunt abdominal trauma in patients who undergoes exploration laparotomy in Sanglah Hospital, Bali. In the present study, among the 65 patients with blunt abdominal trauma who undergoes eksplorasi laparotomy, 49 patients (75.3%) were male. In similar studies, blunt abdominal trauma was reported to be more

common in men. This is probably due to the outdoor activity of men.<sup>1,2,5</sup>

In this study, the age range was from four year old to 74 years. The most frequent age range was 11-20 years, and 31-40 years. In similar studies, the majority of patients with blunt abdominal trauma were in the third decade of their lives. The blunt abdominal trauma occurred more often in younger ages, probably due to being more active in this range of age. Therefore, we can prevent many cases of blunt abdominal trauma by educating and changing culture in this age group.<sup>2,3</sup> The most common mechanism of blunt abdominal trauma evaluated in most studies and the present study were motor vehicle accident which may be because of poor traffic signs and noncompliance of traffic rules.<sup>1-5</sup>

Financial losses caused by blunt abdominal trauma is not exclusively related to hospital costs, financial losses caused by disability, unemployment, cost of reduction in productivity, damage to vehicles, together with the loss of life and hospital admissions imposes huge costs on society.<sup>2</sup>

In this study from 65 patients with blunt abdominal trauma that undergoes 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. Spleen was the most injured organs, followed by liver.

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.<sup>3,6</sup> Rapid, the initial diagnosis of splenic injuries is, therefore, crucial. Twenty six patients were performed splenectomy during the laparotomy in this study, and 13 patients undergo hepatorrhaphy.

Of the 65 patients, 48 patients were had hypovolemic shock, 16 patients had pain in the abdomen or peritonitis as the chief symptom. Other clinical presentations were the retention of urine. 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.<sup>3,6</sup>

In this study, ribs fracture were the most common associated extra-abdominal injuries, followed by lung contusion, haemothorax and pneumothorax. Associated trauma to head and chest and hemorrhage were the commonest cause of mortality. In the present study from 65 patients, 10 patients died, 55 patients were cured completely, and 13 patients suffered complications during treatment.

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