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# PATTERN OF BLUNT ABDOMINAL TRAUMA WITH ITS OPERATIVE FINDINGS

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## ABSTRACT

**Objective:** In this study our main aim is to evaluate the correlation between the patterns of blunt abdominal trauma with its operative findings. **Methods:** This study conducted in the Surgery Unit-Ill, Chittagong Medical College Hospital, Chittagong starting from January 2004 onwards. Patients were selected randomly irrespective of age. A diagnosis was made on clinical (Detailed history, examinations) and some preoperative investigations like plain X-ray abdomen in erect posture, X-ray chest, Hb%. As this study included only the admitted patients, many of those with the same kind of trauma who succumbed to death on the way to or at the emergency department due to associated other grievous injuries like head injury, vascular injury etc were not included here. **Results:** In this study series of 50 cases with blunt abdominal trauma majority of cases were due to Road Traffic Accident which includes motor vehicle accident, pedestrian stuck and motor cycle accident and resulted in a total of 41 casualty occupying 82% of the entire series. Injury in 5 cases were due to assault which were produced by blunt weapons including kicks, blows with fist and other instrument. Injury resulted from fall from height in 2 cases and in the remaining 2 cases by compression (eg crushing by heavy weight, machinery injury etc.). **Conclusion:** We conclude that, we cannot prevent all death of the patients, but at least we can try with our limited resources to reduce the sufferings complications and death of the helpless patients based on our knowledge and keen observations, honest intentions and sincere efforts.

**KEYWORDS:** Blunt abdominal, morbidity, mortality, vascular injury.

## INTRODUCTION

Blunt abdominal trauma is gradually increasing in our country due to rapid urbanization and increased social unrest even in rural areas. Thousands of people, majority of them are young, active group of our population are becoming disabled or losing their lives for this sort of injury each year. Of these many cases get admitted in hospital on delay. Some cases present only with blunt abdominal injury and other are associated with chest injury, head injury, fractures. Blunt abdominal trauma is more important than penetrating trauma as it is more common in civilian practice and it is more difficult to manage since clear cut indications for operative interventions may be delayed and even sometimes absent.[1] Most of blunt abdominal injuries are connectable if presented earlier, but even slight delays in their recognition often greatly impair the chance of recovery. In western country there are different levels of trauma care. But in a poor country, where there is limitation of diagnostic and other facilities, early admission, early evaluations and management of blunt abdominal injuries can save many lives with no or some disablement.[2] In western countries there are many studies on blunt abdominal injuries but there is no definite statistics on death from blunt abdominal trauma in our country. This study will show types and mechanism of blunt abdominal injuries, effects of early and delayed admission and management in hospital and thus will create awareness among skilled and unskilled people and ultimately decrease the morbidity and mortality.

## OBJECTIVES

General Objective

- To assess the correlation between the patterns of blunt abdominal trauma with its operative findings.

Specific Objective

- To observe the patterns of blunt abdominal trauma.
- To observe the operative findings following blunt abdominal trauma.

## MATERIALS AND METHODS

This study conducted in the Surgery Unit-Ill, Chittagong Medical College Hospital, Chittagong starting from January 2004 onwards. Patients were selected randomly irrespective of age. A diagnosis was made on clinical (Detailed history, examinations) and some preoperative investigations like plain X-ray

abdomen in erect posture, X-ray chest, Hb%. As this study included only the admitted patients, many of those with the same kind of trauma who succumbed to death on the way to or at the emergency department due to associated other grievous injuries like head injury, vascular injury etc were not included here. Patients with penetrating trauma and non- traumatic abdominal injuries were excluded from this study. All the findings of clinical examinations, investigations, treatments, preoperative findings, outcome and complications were recorded in protocol form attached herewith.

## RESULT

In this study series of 50 cases, with blunt abdominal trauma, majority of cases were due to Road Traffic Accident which includes motor vehicle accident, pedestrian struck and motor cycle accident and resulted in a total of 41 casualty occupying 82% of the entire series. Injury in 5 cases were due to assault which were produced by blunt weapons including kicks, blows with fists and other instrument (Like hockey sticks). Injury resulted from fall from height in 2 cases and in the remaining 2 cases by compression (e.g. crushing by heavy weight, machinery injury etc.).

**Table-I: Mechanisms of injury and it's distribution (n- 50).**

| Mechanism | Number of patients | Percentage (%) |
|---|---|---|
| Road traffic accident(RTA) | 41 | 82 |
| Assault | 5 | 10 |
| Fall from height (FFH) | 2 | 3 |
| Miscellaneous | 2 | 4 |

**Table II: Age distribution of the patients (n=50).**

| Age (Years) | Number of patients | Percentage (%) |
|---|---|---|
| 0-10 | 1 | 2 |
| 11-20 | 11 | 22 |
| 21-30 | 18 | 36 |
| 31-40 | 12 | 24 |
| 41-50 | 7 | 14 |
| 51-60 | 1 | 2 |

**Table III: Sex distribution of the patients (n=50).**

| Sex | Number of patients | Percentage (%) |
|---|---|---|
| Male | 42 | 84 |
| Female | 8 | 16 |

The age of the patients in this study series ranged from 8 years to 58 years with the highest incidence in persons between 21 to 30 years (36%), one patient was below 10 years.

There were 42 male (84%) and 8(16%) female patients in this series of cases.
So male: female ratio is 5:1.

**Table IV: Presentation of the patients (n=50).**

| Presentation | Number of patients | Percentage (%) |
|---|---|---|
| Painin abdomen | 40 | 80 |
| Shock | 9 | 18 |
| Vomiting | 15 | 30 |
| Dyspnoea | 8 | 16 |
| Retention of urine | 9 | 18 |
| Abdominal distension | 34 | 68 |
| Haematuria | 1 | 2 |
| Palor | 19 | 38 |

**Table V: Clinical findings and its distribution (n=50).**

| Clinical findings | Number of patients | Percentage (%) |
|---|---|---|
| Abdominal distension | 40 | 80 |
| Tenderness | 43 | 86 |
| Rigidity | 25 | 50 |
| Obliteration of liver dullness | 17 | 34 |
| Hypotension | 22 | 44 |
| Absent bowel sound | 15 | 30 |
| Abrasion | 7 | 14 |
| Bruise | 7 | 14 |
| Tachypnoea | 12 | 24 |
| Anaemia | 25 | 50 |
| Dehydration | 21 | 42 |
| Lacerations | 5 | 10 |

The commonest mode of presentation were pain in abdomen (40), abdominal distension (34), palor (19), vomiting (15) and retention of urine (9) (Table-IV). Major clinical signs included signs of peritonitis, hypotension (22), absent bowel sound (15) (Table-V). Peritoneal tap resulted in bloody aspiration in 11 cases. Peritoneal lavage was not done. Although majority of patients with retention of urine was due to urethral injury, in our study, according to title it was excluded. In this study retention was due to pelvic fracture (10). The patients with hypotension and shock were those who had major organ injury like spleen, liver, kidney and those came late with intestinal injury. The patients with small gut (22) and large gut (5) injury both developed signs of peritonitis early than the patients with other injuries. Abdominal injuries were evident by local signs of injury on abdominal or chest wall, tenderness, absent bowel sound and abdominal distension (34). In the unconscious patient, intra-abdominal injury was suspected from signs of abdominal distension, signs of injury on anterior abdominal wall, hypotension. Obliteration of liver dullness was Found in 7 cases and all of the them had gut injury. Plain x-ray abdomen in upright posture demonstrated 16 cases with free gas

under diaphragm.

**Table VI A: Time lapse between occurrence and admission and its distribution (n=50).**

| Time Lapse (Hours) | Number of patients | Percentage (%) |
|---|---|---|
| 0-1 | 2 | 4 |
| 2-6 | 36 | 72 |
| 7-12 | 7 | 14 |
| 13-24 | 5 | 10 |
| > 24 hrs | 0 | 0 |

**Table-VI B: Time lapse between admission and operation its distribution (n=50).**

| Time Lapse (Hours) | Number of patients | Percentage (%) |
|---|---|---|
| 0-2 | 8 | 16 |
| 3-6 | 20 | 40 |
| 7-12 | 12 | 24 |
| 13-24 | 4 | 8 |
| > 19 hrs | 6 | 12 |

All the patients arrived at Surgery Unit-Ill between half an hour to 24 hours. Beyond this period they were admitted in general surgery unit. In this study the average time lapse between occurrence of trauma and admission in Surgery Unit-Ill was 2.29±0.78hours. The patients were brought to hospital by policeman, passersby, relatives colleagues etc. Average time lapse between admission and operation was 2.62±1.21 hours after resuscitation.

**Table VII: Frequency of associated injury (n=50)**

| Associated injury | Number of patients | Percentage (%) |
|---|---|---|
| None | 18 | 36 |
| Pelvic fracture | 10 | 20 |
| Thoracic injury (Rib fracture) | 11 | 22 |
| Long bone fracture (lower limb) | 3 | 6 |
| 1Soft tissue injury | 10 | 20 |
| Head injury | 1 | 2 |

Among the associated injuries, pelvic fracture (20%) was common (Table-VII) and it was related to Road Traffic accident. Most of the pelvic fractures were responsible for the injury to the urethra.

**Table-VIII: Operative management of intra-abdominal injury (n=50)**

| Viscera and operation | No. of patients |
|---|---|
| **Small gut injury** | |
| Simple repair | 15 |
| Resection anastomosis | 7 |
| **Mesentery** | |
| Simple repair | 10 |
| Resection anastomosis | 2 |
| **Liver** | |
| Repair | 7 |
| Excision of necrotic tissue | 1 |
| **Spleen** | |
| Splenorraphy | 2 |
| Splencetomy | 4 |
| **Urethral injury** | |
| Suprapubic cystostomy | 10 |
| **Kidney** | |
| Neprectomy | 3 |
| **Gallbladder** | |
| Cholecystectomy | 1 |
| **Large gut** | |
| Repair | 5 |
| Right hemicolectomy | 1 |
| Trasverse colostomy | 1 |
| lleostomy | 2 |

Table-VIII shows the operative procedure carried out in this series. 15 patients with small injury and 12 patients with mesenteric injury needed only simple repair procedure. 7 patients with small gut injury needed resection anastomosis.

Among 7 patients with liver injury simple repair was done in 7 cases and in 1 case, excision of necrosed liver tissue done along with repair.

4 patients of splenic injury needed splenectomy and 2 patients needed splenonraphy. All the cases of liver and splenic injury were resuscitated quickly.

## DISCUSSION

Abdominal trauma is a very common day-to-day incidence in our society occurring both accidentally (e.g., road traffic accidents) and incidentally (e.g., assault). Today trauma ranks overall as the fourth leading cause of death in the United States.[3]Injuries to the abdomen and its contents account for approximately 10 per cent of the 130,000 trauma deaths occurring annually in the United States.[4] In spite of the recorded high incidence of death due to this cause there is no definite statistics in our country.

Injury is produced by forces that deform tissues beyond their failure limit. Blunt trauma distributes energy over a larger area. Such an injury may be associated with rapid acceleration (pedestrian struck), or rapid deceleration (high speed motor vehicle accident and fall). Due to differential inertia such an injury produces extreme

degree of strain at point of anatomical fixation. Severe direct deformations of tissues also occur at point of direct contact. As described earlier in part-I, abdomen may be divided into four parts for clinical evaluation[11] and it is obvious that the position of the organ determines its vulnerability to injury.[5]

The ages of the patients in the study series ranged from 8 years to 58 years with the highest incidence (36%) in persons between the ages of 21 to 30 years followed by the age group between 31 to40 years (24%). One patient was below ten years of age and on patient was over 50 years of age. The above figure indicates that affected people are those who are most mobile and active in their daily life. They are the breadwinner of the family and as such subjected more to the various traumatic agents in their daily life both on the road and in the working place as well.[6]

The patients were brought to the hospital by policemen, passersby on a autorickshaw, relatives, colleagues etc. Most of them were brought by policemen and on lookers in scooters. All the patients arrived in the Surgery Unit-Ill between half an hour (30 minutes) to 24 hours. Most of patients reported between 2-6 -hours (68%), followed by 7-12 hours (18%). The average time lapse between occurrence and admis ion to the Surgery Unit-Ill was 2.29 hours. This means that considerable time has been lapsed before the patients were received by the hospital. If the traffic constables are taught to contact hospital emergency as soon as possible .and ambulance service can be provided on priority basis to these patients a significant improvement in the outcome of the management of the patients in respect to morbidity and mortality can be expected. Not only the policeman, but also the general people must be taught what to do and how to carry injured patients following accidents. The proper way of passing these lessons of first-aid to the general people is by casting through national audio-visual system like radio, television.

In this study series all the abdominal organs were not found to be involved No involvement of the diaphragm, stomach, pancreas, uterus and great vessels were found in this series of study. Multiple abdominal injury occurred in 15 cases which included small gut and mesenteric injury, small gut and large gut injury, small gut and urinary bladder injury, liver and spleen injury, liver and gall bladder injury. Pattern of organ involvement found in this study is different from western series. In the study series of Fitzerald and associates.[13]

Small intestine and mesentery injury were next in position to these two solid organs in their series. Whereas in this study of 50 cases, small intestine injury (23 patients) occupies the top of the fist followed by mesentery (12 patients) urinary bladder (10), large intestine (8 patients), spleen (6 patients), kidney (3 patients) successively.[7] The difference in findings (solid organ versus hollow viscus injury) with the western countries may be due to early death of the patients with liver or spleen injury on the spot or way to the hospital due to poor ambulance service, fess consciousness of the on lookers, policeman, poor health of the patients etc.[8] As such, instead of coming to Surgery Unit-Ill the patients with solid organ (e.g. liver, spleen especially) injury straight way go to the morgue and they are not included in the study series, which may not be the fact in western country.[9]

Lastly, the duration of hospital stay was recorded. Out of 50 cases 5 patients died. Their hospital stay was not considered in this calculation.[10] Form the chart it is clear that most of the patients (20) left hospital between the period of 7 to 10 days. Only 4 patients stayed more than 21 days in the hospita1. Of these 4 patients, one was the case of anastomotic leakage along with residual abscess and remaining 3 cases were- the cases of wound infection with dehiscence. Many of the patients who developed wound infection dehiscence were released by third week.

## CONCLUSION

This study of small series of 50 cases of blunt abdominal trauma was an enthusiastic approach towards realization of the importance of early detection of abdominal organ injury and its management. In this dissertation, an attempt has been made to evaluate the clinical pattern and mechanism of blunt abdominal trauma, their arrival at hospital after incidence and their management. In conclusion we can conclude that, we cannot prevent all death of the patients, but at least we can try with our limited resources to reduce the sufferings complications and death of the helpless patients based on our knowledge and keen observations, honest intentions and sincere efforts.

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