

OUR EXPERIENCE WITH BLUNT ABDOMINAL TRAUMA

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ABSTRACT

BACKGROUND

Blunt abdominal trauma is an emergency and is associated with significant morbidity and mortality.

The aim of the study is to study incidence, demographic profile, epidemiological factors, mechanism of trauma, treatment modalities, associated injuries, postoperative complications and morbidity and mortality.

MATERIALS AND METHODS

A retrospective analysis of 72 patients of blunt abdominal trauma who were admitted in government general hospital between May 2013 to April 2015 in Department of General Surgery, Government General Hospital, Guntur, with in a span of 24 months were studied. Demographic data, mechanism of trauma, management and outcome were studied.

RESULTS

Most of the patients in our study were in the age group of 21-30 years. Spleen was the commonest organ involved and most common procedure performed was splenectomy. Most common extra-abdominal injury was rib fractures. Wound infection was the commonest complication.

CONCLUSION

Initial resuscitative measures, thorough clinical examination and correct diagnosis forms the vital part of the management. FAST is more useful in blunt abdominal trauma patients who are unstable. X-ray revealed 100% accuracy in hollow viscous perforation in blunt abdominal trauma patients. CT abdomen is more useful in stable patients. Definitive indication for laparotomy was haemodynamic instability and peritonitis. Associated injuries influenced morbidity and mortality. Early diagnosis and prompt treatment can save many lives.

KEYWORDS

Blunt Abdominal Trauma (BAT), Focussed Assessment with Sonography in Trauma (FAST), Nonoperative Management (NOM), Spleen.

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BACKGROUND

Trauma is a study of medical problem associated with physical injury. Trauma continues to be the leading cause of acute abdomen in day to day surgical practice and it is associated with high morbidity and mortality in developing country like India. It is gaining importance in all surgical specialties and traumatology has evolved. The abdomen is vulnerable to injury since there is minimal bony protection for underlying organs. In developing countries like India in general and abdominal trauma in particular is increasing at a fast rate due to urbanisation, motorisation and civil violence.

The aetiological spectrum and mechanisms of injury of abdominal trauma vary from place to place. In our region falls, assaults, motor vehicle accidents and pedestrian's automobile accidents are more. Diagnostic tools that help in treating doctor in optimum management of blunt abdominal trauma include clinical examination, focussed assessment sonography for trauma, CT scan, abdominal paracentesis, x-ray abdomen and chest x-ray.

The management of patients with abdominal trauma has several important elements, i.e. adequate prehospital care, initial assessment cardiorespiratory resuscitation and correct diagnosis are of utmost importance in trauma management.

MATERIALS AND METHODS

A retrospective study of 72 cases blunt abdominal trauma presented to Government General Hospital, Guntur, from May 2013 to April 2015 was done. The patients with blunt abdominal trauma with associated injuries were included in the study. Paediatric age group and penetrating injury abdomen were excluded from the study.

An initial systolic blood pressure, pulse rate were recorded on admission. Routine investigations including

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haemoglobin, blood grouping and biochemical and imaging (x-ray of chest and abdomen and ultrasound and CT scan were performed on admission).

Patients who did not respond to conservative management and haemodynamically unstable and who continue to deteriorate despite adequate resuscitation or who have evidence of bowel injury were taken to immediate laparotomy. Inferences were made for various variables like age, sex, cause of blunt abdominal trauma, time of presentation, signs and symptoms, operative findings, various procedure employed and associated extra-abdominal injuries, postoperative complications and mortality were included in the study.

RESULTS

Demographic Profile

We included 72 blunt trauma patients; 66 were males and 5 were females; mean age was 25 years. The predominant age group was 21-30 years consisting 40% of patients.

Epidemiological Factors

Road traffic accidents involving both pedestrians and vehicular accidents accounted for 66% of injuries.

Clinical Features

Majority of patients presented with pain abdomen (66) followed by vomiting in 52 patients. Among physical signs generalised abdominal tenderness and guarding were present in 50 (70%) of patients, whereas 24 (34%) were in hypovolaemic shock.

Extra-Abdominal Injuries

Commonly associated extra-abdominal injuries were soft tissue injury including retroperitoneal haematoma 14 (20%), head injury 10 (14%) and haemothorax 10 (14%). Associated orthopaedics injuries in our study were mainly rib fractures in 14 (20%). Most of the associated injuries were treated conservatively where as haemothorax and pneumothorax required intercostal drainage.

Time of Presentation

More than half of the (38) patients presented with 4 to 8 hours of injury.

Abdominal Injuries

X-ray abdomen, ultrasound abdomen and CT scan abdomen and pelvis were done and multiple injuries were revealed. Splenic injury was observed in 30 (42%) cases, liver trauma in 18 (25%) and small bowel in 12 (16%) cases. Commonest surgery performed was splenectomy in 22 patients followed by perforation closure.

Morbidity and Mortality

Mortality in our study was seen in 6 (8%) cases. The commonest cause was irreversible shock followed by cardiopulmonary arrest, septicaemia and respiratory failure. Postoperative complications most frequently observed in our

study were wound infection in 8 (12%) and wound dehiscence in 5 (7%).

| Sl. No. | Causes of Blunt Trauma | Number of Patients | Percentage of Patients (%) |
|---------|------------------------|--------------------|----------------------------|
| 1. | Motor vehicle accident | 38 | 53 |
| 2. | Fall from height | 14 | 20 |
| 3. | Assault | 20 | 27 |

Table 1. Causes of Trauma

| Sl. No. | Associated Injury | Number of Patients | Percentage of Patients (%) |
|---------|-------------------|--------------------|----------------------------|
| 1. | Head injury | 10 | 14 |
| 2. | Haemothorax | 10 | 14 |
| 3. | Pneumothorax | 4 | 6 |
| 4. | Rib fracture | 14 | 20 |
| 5. | Femur fracture | 7 | 10 |
| 6. | Pelvis fracture | 7 | 10 |

Table 2. Associated injuries

| Sl. No. | Organ Involved | Number of Patients | Percentage of Patients (%) |
|---------|-----------------|--------------------|----------------------------|
| 1. | Spleen | 30 | 42 |
| 2. | Liver | 18 | 25 |
| 3. | Small intestine | 12 | 16 |
| 4. | Mesenteric tear | 8 | 11 |
| 5. | Pancreas | 2 | 3 |
| 6. | Urinary bladder | 2 | 3 |

Table 3. Distribution of Cases

DISCUSSION

The patients who have sustained blunt abdominal trauma may have sustained injury simultaneously to other organs and it is particularly important to examine for injuries of head, thorax and pelvis and extremities.

Out of 72 cases in our study, 66 (92.8%) were males 5 (7.2%) were females. 40% of patients were in 21-30 years age groups. This goes in accord with studies of Davis et al⁽¹⁾ and Lowel et al, median age was 32 years. The male preponderance in our study reflects that greater mobility of males for work such as driver and mechanic for automobiles and recreational activities, alcohol drinking maybe resulting in high exposure to risk of traffic injuries. Road traffic accidents accounted for 66% of cases. This was equivocal with other studies conducted by Perry and Morton et al.⁽²⁾⁽³⁾

In our study, maximum number of patients were brought to hospital within 5-10 hours after injury.

Commonest intraabdominal injury was splenic injury 30 (42%) followed by liver injury and hollow viscous perforation. Commonest hollow viscous injury was small

bowel perforation. Most common bowel involved was ileum. These result were consistent with other studies Davis and Morton et al.⁽¹⁾⁽⁴⁾

Symptoms

In the present study, most common symptom was pain abdomen and second most common symptom was abdominal distension. Another study by Tripathi et al also reported pain abdomen in 91% of their patients.

Signs

Out of 72 cases in our study, 85% of patients has abdominal tenderness at the time of presentation. Local and generalised guarding was present in 48% of cases. In present study, 28 patients are presented with shock out of which 18 were with splenic injury and 6 with liver injury and 4 had small bowel injury.

Maximum number of patients were brought to hospital within 5-10 hours after injury. Delay in hospital admission was also reported by Indian authors (Tripathi et al).

Investigations

In present study, x-ray abdomen was done in 44 cases out of which 12 cases had pneumoperitoneum, which is 100% accuracy. Another study by Mohapatra et al reported accuracy of x-ray erect abdomen to be 100% in detecting hollow viscous injuries.

In present study, FAST was major advantage for unstable patients. In recent years, FAST for trauma has emerged as a useful diagnostic test in evaluation of blunt abdominal trauma. In present study, FAST detected 100 mL of free fluid, which was slightly higher compared to other studies.

Organs Involved

The most frequently injured organs in blunt trauma abdomen are spleen (42%), liver and small bowel.

Procedures done for splenic trauma in our study was splenectomy. Splenectomy was done for most of grade 4 and 5 trauma and haemodynamically unstable grade 3 injuries. Haemodynamically stable grade 1 and 2 injuries are followed with series of physical examinations, ultrasonography, thus avoiding unnecessary laparotomy.⁽⁴⁾

Commonest intraabdominal injury followed by spleen was liver injury followed by small bowel. Perforation closure was done 8 cases of bowel injury and resection and anastomosis was done in 4 cases. Bowel injuries forms the major chunk of failure of Nonoperative Management (NOM).

Mesentery was the next common organ involved. Vertical mesenteric tears are closed and horizontal mesenteric tears are managed with resection and anastomosis.

Kidney and urinary bladder injuries were frequently also associated with pelvic fractures and they are managed by urologist in our institute.

Surgeon should look for other sites of injuries to rule out extra-abdominal injuries, include rib fractures (20%), soft tissue injuries. Incidence of rib fractures was consistent with study conducted by Fazili et al,⁽⁵⁾ but we accounted for

higher amount of haemothorax and pneumothorax, which were managed by intercostals drainage.

Mortality rate in our study was 8%, i.e. 6 patients. The major cause of mortality was delayed presentation of patients and poor general condition and massive injuries and associated injuries.

Commonest postoperative complication in our study was wound infection (14%) with in most cases were minor infections were managed conservatively. This was consistent with studies conducted by Beall et al.⁽⁶⁾ The cause of infection in these patients were necrotic tissue, mutilating injuries and late presentation.

CONCLUSION

Road traffic accidents forms the most common mode of injury. Initial resuscitation measures and correct diagnosis forms the most vital part of blunt abdominal trauma management.⁽⁷⁾

Prompt evaluation of abdomen is mandatory to prevent morbidity and mortality. Mortality is related to delayed presentation and diagnosis, associated injuries and delayed surgical intervention. Clinical abdominal assessment is inaccurate of the BAT patients since there are often distracting injuries, altered level of consciousness, nonspecific signs and symptoms and large differences in individual patient reactions to intraabdominal injury. Out of multiple modalities available for evaluating stable patients, CT scan along with haemodynamic stability are best in evaluating, which patient requires surgery or in deciding, which patient can be safely discharged from emergency. The main draw backs of CT scan are its low sensitivity in detecting bowel injuries and haemodynamically unstable patients. Damage control laparotomy is a potentially lifesaving procedure with the potential to mitigate the devastating clinical outcomes. Swift recognition, timely and proper application of imaging methods in BAT patients along with physical examination have significantly decreased the number of nontherapeutic and unnecessary laparotomies as a result and has increased nonoperative management of solid organ injuries.⁽⁸⁾

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