

AN EXPERIENCE OF SOLID ORGAN INJURY FROM BLUNT ABDOMINAL TRAUMA: A STUDY OF 45 CASES

SHARMA ANUJ¹, KUMAR VIRENDRA² & KUMAR PRADEEP³

¹Associate Professor, Department of Surgery, LLRM Medical College, Meerut, Uttar Pradesh, India

^{2,3}Assistant Professor, Department of Surgery, LLRM Medical College, Meerut, Uttar Pradesh, India

ABSTRACT

The present study aims to analyse the cause, presentation, diagnostic method, management and the outcome of solid organ injuries from blunt abdominal trauma. Blunt abdominal trauma (BAT) is a frequent medical emergency. The morbidity and mortality associated with this type of trauma is quite significant if the diagnosis of the same is delayed or managed aggressively. Trauma is the second largest cause of disease accounting for 16 percent of global burden.

According to the World Health Organisation estimates, by 2020, trauma will be the main cause of loss of productive life for the entire world population. The study comprises of 45 patients with blunt abdominal trauma, who were found to be suffering from liver and spleen injuries. Out of 45 patients, 30 of them were treated conservatively. And remaining 15 of them were subject to surgical procedure. The present study analysed patients with respect to the cause, presentation diagnostic methods, associated injuries, treatment and mortality of blunt abdominal trauma.

The study sample consisted of patients in the age group of 21 to 35 years with an M: F ratio of 8:1. The most common cause of injury was motor vehicle accident (86 percent). Injury of spleen was involved in 55 percent of the cases, Rib fracture in 22 percent of the cases was the common extra abdominal injury. The mortality rate was 4 percent. The most common complications was wound sepsis in 11 percent of the patients. The vital part of management is initial resuscitation measures, complete clinical examination and correct diagnosis. Conservative management was carried out in 66 percent of the patients with splenic and liver injuries. The time of presentation of patients, early diagnosis and prompt treatment would save lives.

KEYWORDS: Blunt abdominal trauma, trauma, spleen, computed tomographic scan, early diagnosis, resuscitation.

INTRODUCTION

METHODOLOGY AND TOOLS OF ANALYSIS

Forty five patients of Blunt Abdominal Trauma who were admitted in LLRM medical College Meerut, UP, India (A level 2 trauma centre and teaching hospital) were subjected to retrospective analysis. These patients were analysed within a span of 12 months. The 45 patients included in the study were those with injuries to liver, spleen or both liver and spleen. They belonged to both sexes and all age groups.

All the patients were assessed and resuscitated according to the ABCDE approach of the Advanced Trauma Life Support (ATLS) protocol immediately on admission. A complete history of the mechanism of the injury was obtained in all patients. The patients were subjected to abdominal ultrasonography and 64 percent of them were advised for subsequent

CT scan of abdomen and pelvis.

The patients were chosen for Non operative management based on their alertness, and checked whether they were haemodynamically stable without or with minimal peritoneal irritation on abdominal examination, with AAST (American Association for the Surgery of Trauma) organ injury scale 1 – 3 on CT scan and absence of other clear indication for laparotomy. When the patient deteriorated either clinically or haemodynamically, a decision for laparotomy was taken. However, all NOM – group patients were admitted to the surgical intensive care unit and had regular physical examination, haematocrit check and imaging when in doubt. The other patients were subjected to laparotomy for their injuries.

RESULTS

Demographic Profile

The study included 45 blunt trauma patients, out of which 40 (88%) were males and 5 (12%) were females, which constituted 66% of the patients.

Epidemiological Factors

The main reasons leading to these injuries were Road traffic accidents involving both pedestrians and vehicular accidents that accounted for 86% of the injuries.

Time of Presentation

Twelve of the patients, i.e., 26%, were presented within six hours of the injury and thirty of the patients i.e., 66% of the patients were presented within 6 hours to 24 hours of injury.

Mode of Presentation

Five of the patients i.e., 11% were presented with grade 3 haemorrhagic shock and 17 (37%) of the patients were presented with grade 2 haemorrhage shock.

Operative versus Non Operative Management

The study on forty five patients included those comprising of injuries of the liver (n=17), the Spleen (n=3). Out of the forty five, fifteen had to undergo laparotomy and thirty were considered suitable for Non operative management depending upon their haemodynamic stability and radiological investigation results. Three of the patients who were initially considered for conservative management for splenic injury underwent splenectomy due to clinical deterioration.

MORBIDITY AND MORTALITY

The mortality rate in the sample size of the study was 4%. i.e., 2 patients died due to haemorrhage shock due to complex Hepatic injury. The Post operative complications most frequently observed in the study were Wound sepsis in 11% of the cases and chest infection in 8% of the cases.

DISCUSSIONS

The multitude of the manifestations of the Blunt Abdominal Trauma is what often proved to pose the challenge to a trauma surgeon. The Physical examinations is the cornerstone of the whole process of the trauma triage (1).

Upon initial assessment the findings of significant traumatic injury can be subtle and the diagnosis of intra

abdominal injury uncertain. It was observed that between 20% and 40% of patients with significant haemoperitoneum have a normal abdominal examination (2, 3). Abdominal findings may be absent in 40% of the patients with hemoperitoneum. It was also observed that clinical evaluation of blunt abdominal injuries may be masked by other more obvious external injuries (4)

It was found that Non therapeutic laparatomies have significantly reduced with proper and timely applications of imaging methods in BAT patients along with physical examination. The frequent cause of preventable death after trauma was unrecognized abdominal injury. (5)

The 45 sample size of patients in the study consisted of 66% in the age group of 21 – 35 years of age. This shows accordance with studies of Davis et al (6) and Lowe et al. (7), where 88% of the cases were males and 12% were females, with an M: F ratio of 8:1. It is inferred that the male ponderance in the study reflects greater mobility among males either for work, as professional drivers, may result in larger exposure of them to risk of traffic injuries. Automobile road accidents accounted for 86% of the cases of BAT. This was found to be slightly higher when compared with the other studies conducted by Perry (8) and Morton et al (9). It is thus inferred that prevention of accidents can decrease fatality.

It is observed that the commonest intra-abdominal injury was splenic injury in 53% of the cases followed by liver injury. These results were found consistent with other studies of Davis (6) and Morton et al (9).

The **Procedures aligned for splenic trauma** in the present study were, splenectomy in 11 cases, which was done for most of grade 4 and 5 trauma and hemodynamically unstable patients of lesser grades. A series of physical examinations, ultrasonography or CT scans were done for patients who were hemodynamically stable, to avoid unnecessary laparotomy.

Strategies based on haemodynamic stability and CT scan findings are now being used in established NOM (non operative management) of solid organ injuries including liver, spleen, kidneys, pancreas and pelvic injuries (10). The Non-therapeutic laparotomy (NTL) for trauma patients varies from 1.7% to 38% depending on the experience and practice patterns of the individual trauma centre (11). It is observed that in one of the prospective study of 938 laparatomies for abdominal injury, 27% of them were deemed unnecessary (12). NTL is thus associated with significant morbidity and impacts the health system.

The General Principles of NOM are:

Always remember the mechanism of injury in mind

It is important that the patient should be alert, awake and responsive

The patient ought to be examined repeatedly

The patient must be haemodynamically stable and have no coagulation disorders

There must be no other clear indication for laparotomy

High index of clinical suspicion needs to be maintained.

A high index of clinical suspicion needs to be maintained.

Extreme caution needed in multiple injured patients.

Higher level of medical care and observation with round- the- clock availability of laboratory, radiology and operation theatre.

NOM is to be abandoned (1) when it is noted that there is

- Deterioration of vital signs
- Development of new peritoneal signs
- Continued need for blood transfusion
- Falling haemotocrit or progressing haematoma

The associated risks (1) with NOM are:

- Injuries that were missed while examining
- Delayed diagnosis and treatment
- Retained hematoma, sepsis and /or abscess.
- Bowel/biliary/pancreatic/urinary leaks
- Pseudoaneurysm formation and delayed rupture.
- Delayed treatment of vascular injuries and their complications
- Risks involved in blood transfusion

Among those patients who underwent surgery, infections (19% in our study) that prevailed were the most common cause of morbidity and mortality rate is higher due to greater severity of the injury. The choice between the two modalities of the treatment is guided by haemodynamic considerations rather than by the severity of organ injury. (3)

CONCLUSIONS

The most challenging aspect of the blunt abdominal management is the Non – Operative management mainly due to its diversity of presentation and wide range of visceral injuries. However the conservative approach is a satisfying method of managing them and is highly successful in selective cases. The trauma of the surgeons operative burden has been lightened by the dawn of exclusive technological sophistication. The recent sophisticated imaging and the availability of interventional radiologists has eased their burden to a large extent. However the repeated clinical examination by an experienced surgeon in guiding the ultimate therapeutic decision remains unsurpassed. “When in doubt it is better to open and see than to wait and watch” - Grey Turner.

REFERENCES

1. Mohapatra S, Pattanayak SP, et al. Options in the management of solid visceral injuries from blunt abdominal trauma. *IJS* 2003; 65: 263-268
2. Knudson MM, Maull KI. Non-operative Management of solid organ injuries - Past, Present and Future. *Surg Clin North Am* 1999; 79: 1357-71. 3. McConnell DB, Trunkey DD. Non-operative management of abdominal trauma. *Surg Clin North Am* 1990; 70: 677-88.

3. Hassan R, Aziz AA. Computerized tomography (CT) imaging of injuries of blunt abdominal trauma: a pictorial assay. *Malays J Med Sci* 2010;17:29-39 [PMC free article] [Pub Med]
4. Taviloglu K, Yanar H. Current trends in the management of blunt solid organ injuries. *Eur J Trauma Emerg Surg* 2009; 35:90-4
5. Davis J, Cohn I, Nance F. Diagnosis and management of blunt abdominal trauma. *Ann Surg* 1996;183:880-6
6. Lowe RJ, Boyd DR, Frank CM, Baker RJ.. The negative laparotomy for abdominal trauma. *J Trauma* 1997; 2:853-61
7. Perry JF, Jr, McCleelan RJ Autopsy findings in 127 patients following fatal traffic accidents. *Surg Gynaec Obstet* 1964; 119: 586-90 [Pub Med]
8. Morton J, Hinshaw R. Blunt trauma to the abdomen. *Ann Surg* 1957;145:699-711 [PMC free article] [Pub Med]
9. Stawicki SP. Trends in no noperative management of traumatic injuries: A synopsis. *OPUS 12 Scientist* 2007; vol. 1, No. 1. {full_citation
10. Demetriades D, Velmahos G. Technology-driven triage of abdominal trauma: The emerging era of no noperative management. *Annu Rev Med* 2003; 54: 1-15.
11. Renz BM, Feliciano DV. Unnecessary laparotomies for trauma: a prospective study of morbidity. *J Trauma* 1995; 38: 350-356.

