Original article:

Study of management of blunt injuries to solid abdominal organs

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Abstract

Introduction: Blunt abdominal injuries due to road traffic accidents are the sixth leading cause of death in India. Current strategies for conservative management of most blunt abdominal injuries developed from the observation that most of these injuries would 'heal themselves' and that operative intervention could interfere with this process. Due to the inadequate treatment of the abdominal injuries, most of the cases are fatal. The knowledge in the management of blunt abdominal trauma is progressively increasing due to the in-patient data gathered from different parts of the world. In spite of the best techniques and advances in diagnostic and supportive care, the morbidity and mortality remains high. This study was done to evaluate the diagnosis and management of blunt abdominal trauma. And to study the usefulness of conservative management in blunt abdominal trauma.

Material & Methodology: This study is a cross-sectional, hospital based study, conducted in Department of General Surgery, NIMS UNIVERSITY Medical College Jaipur, in period May 2014 – July 2015. Total 30 cases of blunt injuries to solid abdominal organs, above age of 12 years, who did not sustain hollow viscus injury or other associated critical injuries were included in the study.

Observations & Results: Young males are common victims of blunt abdominal trauma. Out of all the cases of Blunt abdominal trauma, in 66.7 % of cases mode of injury was Road traffic accidents. Almost all the patient had abdominal tenderness on presentation (93.3 %). All patients were subjected for ultrasound examination (FAST), out of which all were detected to have free fluid in peritoneum. On clinical examination, accuracy in establishment of organ specific injury diagnosis was only 51.4 %, when compared with final diagnosis. By using ultrasonography, specific organ injury was detected in 82.3 % cases. Liver was the most commonly involved organ (54.3 %). In our study, 87% of patients were treated conservatively. Average duration for conservatively managed patients was 14.4 days and that for operative patients, it was 16.25 days. There were no causalities in our study.

Conclusion: Conservative management should be the choice, as line of management, for solid organ injuries by blunt trauma. In this study 90% patients were treated conservatively without any mortality.

Keywords: Blunt abdominal trauma, Conservative management

Introduction

Blunt abdominal injuries due to RTA are the sixth leading cause of death in India.[1]Blunt abdominal trauma is usually not obvious and can be often missed. Delay in diagnosis and inadequate treatment of the abdominal injuries can be fatal. Our understanding in the management of blunt abdominal trauma is progressively increasing. In spite of the best techniques and advances in diagnostic and supportive care, the morbidity and mortality still remains large.Study of literature reveals that in today's era, such deaths can become negligible if adequate identification of the problem is done and line of management is decided early. In recent past many changes in the treatment of patients with blunt abdominal trauma, have been

taking place. Traditionally, emergency laparotomy was the procedure of choice, currently conservative management is the most common management strategy in hemodynamically stable patients.[2,3,4]Some surgeons are still suspicious of this approach because of the possibility of missed abdominal injuries, delayed recognition of significant intra-abdominal bleeding and associated mismanagement of the patient. It is appropriate for physicians and surgeons to have a healthy skepticism of new techniques until the value of a new approach have been documented and the appropriate patients for such therapies are clearly defined. This study was done to evaluate the diagnosis and management of blunt abdominal trauma. And to study the usefulness of conservative management in blunt abdominal trauma.

Material and methods

This study was a cross-sectional, hospital based study, conducted in Department of General Surgery, NIMS UNIVERSITY Medical College Jaipur, in period May 2014 – July 2015. Total 30 cases of blunt injuries to solid abdominal organs, above age of 12 years, who did not sustain hollow viscus injury or other associated critical injuries were included in the study.

On arrival of patient, initial evaluation and resuscitation with ABCDE (Airway, Breathing, Circulation, Disability and Exposure) and Advanced Trauma Life Support (ATLS) done simultaneously. Four quadrant aspiration was performed for screening. All patients were admitted in SICU and haemodynamic monitoring at hourly intervals was done. Serial haematocrit, haemoglobin estimation, blood grouping and cross-matching and other appropriate laboratory investigations were performed. Appropriate antibiotic therapy and tetanus prophylaxis was also instituted. Patients were subjected to flat plate X-ray abdomen. All underwent abdominal Ultrasonography (USG), initially F.A.S.T. (Focused Abdominal Sonography for Trauma) and later a detailed sonological evaluation, and whenever the condition permitted, CECT whole abdomen was performed.

A decision for laparotomy was taken for those cases which were not responding to resuscitative means, including 2 to 3 blood transfusion or if the patient shifted from stable to unstable stage, that is, increasing pulse / falling BP / increasing respiratory rate / abdominal rigidity / appearance of guarding or if there is any evidence of hollow viscus injury.A detailed record of conservatively and operatively managed cases were kept.

Results

In the study male to female ratio was 3:1. Majority of patients belonged to young age group. Out of all the cases of Blunt abdominal trauma, in 66.7 % of cases mode of injury was Road traffic accidents. This was followed by fall from height in 23.3 % of patients, 10% had injury due to physical assault or blunt object.(**Table 1**)Almost all the patient had abdominal tenderness on presentation (93.3 %).(**Table 2**)All patients were subjected for ultrasound examination (FAST), out of which all were detected to have free fluid in peritoneum. FAST has 100 % sensitivity in this study for detection of blunt abdominal trauma.For comparison between different methods of diagnosis CT scan was considered gold standard diagnostic modality and CT scan report was considered final diagnosis. For two patients CT scan was not performed, as they were hemodynamically unstable even after resuscitation, for them finding on laparotomy was considered as final diagnosis. On clinical examination, accuracy in establishment of diagnosis of specific organ injury was only 51.4 %, when compared with final diagnosis. By using ultrasonography, specific organ injury was detected in 82.3 % cases. It can be easily seen that

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Investigations have major role over clinical examination to diagnose the solid organ injury in blunt abdominal trauma.**(Table 3)**Liver was the most commonly involved organ (54.3%). Spleen was involved in 34.3% of cases, followed by kidney and pancreas.**(Table 4)**In our study, 87% of patients were treated conservatively. While 13% patient underwent operative procedure.**(Table 5)**In present study three cases underwent splenectomy and one case required mesh hepatorraphy.**(Table 6)**Most of the patients were discharged within 10 days of admission i.e. in 43.3 % of cases. Average duration of hospital stay was 14.6 days in our study. Average duration for conservatively managed patients was 14.4 days and that for operative patients, it was 16.25 days.**(Table 7)**One of the patient who was treated conservatively developed intra-abdominal abscess. There were no causalities in our study.**(Table 8)**

TABLE 1.

Causes	No. of cases	Percentage
Road Traffic accident	20	66.7 %
Fall from height	7	23.3 %
Assault/ injury with blunt object	3	10 %
Total	30	100 %

TABLE 2.

Signs & Symptoms	No. of cases	Percentage
Abdominal Pain	25	83.3 %
Abdominal Tenderness	28	93.3 %
Abdominal Distention	18	60 %
Guarding + rigidity	16	53.3 %
Vomiting	3	10 %
Haematuria	1	3.3 %
Pulse >90/min	15	50 %
SBP <90 mmHg	3	10 %
Free fluid	5	16.7 %
BS Absent	5	16.7 %
Shock	1	3.3 %

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TABLE 3.

Organs	Clinical diagnosis	USG diagnosis	CT diagnosis	Final diagnosis
Liver	11	15	18	19
Spleen	5	11	11	12
Kidney	2	1	2	2
Pancreas	None	2	2	2
Total	18	29	33	35

Table 4.

Organ	Present study	Davis et al[5]	Cox et al[6]	Khanna et al[7]	Mohapatra et al[8]
Liver	54.3 %	16 %	33 %	37 %	47.9 %
Spleen	34.3 %	25 %	46 %	26 %	29.2 %
Kidney	5.7 %				14.6 %
Pancreas	5.7 %				8.3 %

TABLE 5.

Management	No. of cases	Percentage
Conservative	26	86.7%
Operative	4	13.3%
Total	30	100 %

TABLE 6.

Procedure	No. of cases
Splenectomy	3
Hepatorraphy	1

TABLE 7.

No. of days	Operatively managed cases	Conservatively managed cases	Percentage
1-10	1	12	43.3 %
11-20	1	10	36.7 %
21-30	2	2	13.3 %
>30	0	2	6.7 %

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TABLE 8.

Complication	No. of patient
Intra-abdominal abscess	1

Discussion

Young males are common victims of blunt abdominal trauma as they are mainly involved in outdoor activities and exposed to RTA injuries.**Davis et al**[5] reported that automobile accidents accounted for 70% of injuries, **Khanna et al**[7] reported 57% cases due to RTA and**Mohapatra et al**[8] observed RTA was the most common etiology (62%). In this study 66.7% of cases were due to RTA. The above observation clearly depicts that the RTAis the most common mode of injury. Considering the signs and symptoms in abdominal injuries, they are notoriously unreliable and are often masked by concomitant head injuries, chest injuries and pelvic fractures. Ultrasound can be considered reliable in detecting solid organ injuries and free fluid in the abdomen. In a study conducted by**Yoshi H et al**[9]the sensitivity of ultrasound in detecting injuries in blunt abdominal injury patients is about 94.6%. In **Qamariet al**[10] study the sensitivity and specificity of FAST in detecting intra-abdominal free fluid was calculated to be 91.9 % and 94.34 % respectively.Our study has comparable results with **Rozycki et al**[11] ,in which he studied 1540 patients and reported that ultrasonography was the most sensitive and specific modality for the evaluation of hypotensive patients with blunt abdominal trauma (sensitivity and specificity, 100%). Now, CT scan has enabled the clinicians to exactly diagnose the extent of intra-abdominal organ injury**. Farrathet al**[12]claims that CT is currently the most accurate examination for this situation. **Danne P**[13] stated that the practice of making diagnosis in blunt injury abdomen by repeated clinical examinations over prolonged periods of time is to be condemned and that CT is the best organ imaging technique. Similar were the finding noted in our study. Accuracy of clinical examination was only 51.4% in detecting organ specific injury. USG abdomen detected injury in 82.3% cases. Contrary to international series where spleen was the most common viscera injured, in the present series, liver is the most commonly involved organ.**(Table 4)**Many studies clearly suggest that conservative management should always be preferred.**Razaet al**[2] did a 10 years study to conclude that conservative management for blunt abdominal injuries, was highly successful in 89.91%. **Velmahoset al**[4] studied 206 patients of BTA, among them 57 (28%) patients underwent immediate laparotomy; the remaining 72% patients were managed conservatively. There is an increase trend towards conservative management if the patient is hemodynamically stable. In present series, 86.7 % patients were successfully managed conservatively.

Conclusion

Conservative management is the best line of management for solid abdominal organ injury, which has been gaining support worldwide. It should only be carried out at tertiary level, where, expertise for emergency exploration including competent anaesthetists, proficient surgeons and latest ICU facilities are available.

The sheet anchor for successful conservative management is proper immediate resuscitation, thorough clinical examination, support by laboratory and radiological investigations

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(including CT scan) and repeated periodical clinical examination.

Although, operative management will be more soothing for treating surgeon as his responsibility would decline with laparotomy, but treating these patients conservatively is always a big challenge, which tests the patience and confidence of treating surgeon.

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