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Original Research Article

Spectrum and Outcome of Blunt Trauma Abdomen at Sardar Patel Medical College and PBM & Associate Group of Hospitals

Dr Avinash Kumar[1] , Dr Sanjay Sharma[2], Dr Mohd Salim[3]
[1]Resident, Department of General Surgery, Sardar Patel Medical College and PBM & Associate Group of Hospitals, Bikaner, Rajasthan
[2]Assistant Professor, Department of General Surgery, Sardar Patel Medical College and PBM & Associate Group of Hospitals, Bikaner, Rajasthan
[3]Professor, Department of General Surgery, Sardar Patel Medical College and PBM & Associate Group of Hospitals, Bikaner, Rajasthan

***Corresponding author**
Dr Avinash Kumar
Email: avinash.mahavar86@gmail.com

Abstract: Blunt abdominal trauma is one of the important components of poly-trauma. It requires suspicion, investigation and proper management in time, to avoid morbidity & mortality. AIM: The aim of this prospective study spanning 1 year w.e.f. Jan, 2016 to December, 2016 in this tertiary care institute of SP Medical College & Hospital, Bikaner was to find out BTA patients in RTA, fall from height, and assault like injuries. We studied type of injuries, male-female ratio, age group& their operative & non-operative management. The study is based on 60 cases of BTA; managed in this institute from admission, investigation, management & possible follow up. Observations are depicted in different tables. Liver is most commonly involved solid organ followed by spleen, kidney & pancreas respectively. Initially solid organ injuries cases where treated by surgery, but than non-operative management are tried in haemostatically stable patients. Hollow visceral injuries were always managed by laparotomy & repair or resection as and when needed. Mortality occurred in 3 patients out 60 patients because of delay to reach hospital or septicemia, renal failure and shock due to multi organ failure. Close supervision with sophisticated infrastructure and quick action significantly reduces mortality.
Keywords: Blunt trauma abdominal, Non-operative management, Road traffic accident

INTRODUCTION

Abdominal trauma is third most common causes, among injuries caused mainly due to road traffic accidents and about 25% of all abdominal trauma cases require exploration. Urban region is more vulnerable for road traffic accidents. Males are more prone for these injuries. Blunt trauma is a leading cause of morbidity and mortality worldwide. Missed intra abdominal injuries and concealed hemorrhage are frequent causes of increase morbidity and mortality, especially in patients who survive the initial phase after an injury. Mortality rates are higher in patients with blunt trauma abdomen than in those with penetrating injuries because of lack of early diagnostic facilities and optimal managements. Blunt injury of abdomen is also a result of fall from height, assault with blunt objects, sport injuries, industrial mishaps, bomb blasts and fall from riding bicycle. Blunt abdominal trauma is usually not obvious, often missed, so, repeatedly clinical and radiological examinations are needed. In spite of the best techniques and advances in diagnostic and supportive care, the morbidity and mortality remains high. The reason for this could be due to the interval between trauma and hospitalization, delay in diagnosis, inadequate and lack of appropriate surgical treatment, lack of high dependency units & ICU care, postoperative complications and associated trauma especially to head, thorax and extremities. The relatively fixed position of the liver and its large size makes it more prone for injury in blunt trauma of the abdomen followed by spleen. Liver and spleen together, account for 75% of injuries in blunt abdominal trauma. Liver is also most common cause of death following abdominal injury. The small and large intestine are the

next most frequently injured organs. The management of blunt trauma abdomen (BTA) is challenging. Currently, conservative treatment is the gold standard for solid organ injuries in hemodynamic stable patients. The suspected or confirmed hollow organs injury requires surgery. Management may involve nonoperative measures or surgical treatment, as appropriate. In order to minimize the mortality in cases of abdominal trauma, risk factors for mortality must be identified and systematically studied.

MATERIALS & METHOD

Hospital based prospective study of 1year (January 2016 to December 2016) at Department of General Surgery, SP Medical College and PBM Hospital, Bikaner. Hospital received total 60cases. Patients admitted with history of blunt trauma abdomen due to road traffic accidents, accidental falls, trauma by blunt objects and assault, above 14 years of age and both sexes. Data were collected from the patients by their clinical history, clinical examination with appropriate investigations on those patients who were be admitted. After initial resuscitation of the trauma victims, a careful history was taken to document any associated medical problem. Routine investigations were performed which include blood grouping and cross matching, complete blood count, HB, platelets, renal function tests, liver function tests, serum electrolytes, serum amylase and lipase, X-ray chest, X-ray FPA, USG,CT abdomen & pelvis. Demographic data collected included the age, sex, mechanism of injury, pattern of solid organ injuries, time of accident to arrival at hospital. Among all poly trauma patients attending the trauma center, 60 patients were diagnosed to have abdominal injury. On secondary survey based on hemodynamic stability, clinical finding and investigation 44 patients were selected for non operative management.

OBSERVATIONS

Total 60 patients of BTA were admitted during study period of one year from January 2016 to December 2016 in the department of surgery, SP medical college, Bikaner. Road traffic accidents(86.7%) were the most frequent mechanism of injury followed by fall from height(10%) and assault(3.3%). Males were commonly involved and urban areas were more prone for injuries. The age group between 14-30 years were most vulnerable to injuries. Liver(45%) was the most common injured solid organ followed by spleen(30%). In hollow viscera terminal ileum(45.5%) was most common involved organ due to junction of mobile and fixed point followed by other parts of gut. Operative management was done in 16(26.7%) patients and 44(73.3%) patients were managed conservatively. Out of the 60 cases of study, 57(95%) patients were treated successfully and discharged. 3 patients were died. The overall mortality rate was 5%.

Table-1: Sex Wise Distribution

SEX	CASES
MALE	52 (86.7%)
FEMALE	8 (13.3%)

Table-2: Age Wise Distribution

AGE	MALE	FEMALE	TOTAL
14-30	34(56.7%)	4(6.6%)	38(63.3%)
31-45	14(23.3%)	1(1.7%)	15(25%)
>45	4(6.6%)	3(5%)	7(11.6%)

Table-3: Distribution on the Basis of Type/Mode of Injury

TYPE OF INJURY	MALE	FEMALE	TOTAL
RTA	47(78.4%)	5(8.3%)	52(86.7%)
FFH	3(5%)	3(5%)	6(10%)
ASSAULT	2(3.3%)	0	2(3.3%)
OTHERS	0	0	0

Table-4: Distribution According To Organ Involved In Injury

ORGAN INVOLVED	NON OPERATED	OPERATED	TOTAL
LIVER	25(41.7%)	2(3.3%)	27(45%)
SPLEEN	16(26.7%)	2(3.3%)	18(30%)
GIT	0	11(18.3%)	11(18.3%)
PANCREAS	1(1.6%)	0	1(1.6%)
KIDNEY	2(3.3%)	0	2(3.3%)
URINANRY BLADDER	0	1(1.6%)	1(1.6%)
MESENTRY	0	3(5%)	3(5%)
DIAPHRAGM	0	1(1.6%)	1(1.6%)

Table-5: Distribution According to Organ of GIT Injured (11 cases)

ORGAN	NO. OF CASES
STOMACH	1 (9.09%)
DUODENUM	1 (9.09%)
JEJUNUM	2 (18.2%)
ILEUM	5 (45.5%)
SIGMOID COLON	2 (18.2%)

Table-6: Distribution According To Management Done

MANAGEMENT	MALE	FEMALE	TOTAL
CONSERVATIVE	39(65%)	5(8.3%)	44(73.3%)
OPERATIVE	15(25%)	1(1.7%)	16(26.7%)

Table-7: Distribution According To Outcome

OUTCOME	MALE	FEMALE	TOTAL
DISCHARGED	50(83.3%)	7(11.7%)	57(95%)
DIED	2(3.3%)	1(1.7%)	3(5%)

DISCUSSION

Most of study showed young and previously healthy & economically productive population is usually victims of BTA[6]. In our study, the most vulnerable age group noted was 14-30 years (63.3%)[7.8]. Our study showed male predominance of victims 86.6% with male to female ratio of 6.5:1[3,4,8,9, 10]. The male predilection is due to the fact adult male are the earning member of family and an active outdoor activities fast driving vehicles, aggressive behavior and may be under influence of alcohol in contrast to females[9,10] .The most common mode or cause was road traffic accident[4,5,11,12,13] followed by fall from height, assault and other injuries like sports injuries, bomb blasts, cyclists injury etc. It may due to easy availability of vehicles, increase number of vehicles & increase number of population, unaccustomed to traffic, traffic sense and ignorance of safety measure leading to increased congestion on roads can directly related to the number of traffic accident[14,15]. Most of road traffic accidents occurs in urban areas because of number of vehicles and population leading to congestion of roads. Also lack of sense about road traffic rules, moving the population toward urban area for their jobs. Considerable forces are usually required to injure solid and hollow viscera in abdomen. Three basic mechanism explains the injury to abdominal organs i.e. deceleration, external compression and crushing injuries[16]. Assessment of hemodynamic stability is most important initial concern in the evaluation of patient with blunt abdominal injury. In our study out of 60 cases 36(60%) cases arrive as stable condition and 24(40%) cases arrive at hospital with instability. The stability was decided on the basis of vital parameters. In the hemodynamic ally unstable patient, a rapid evaluation of hemoperitoneum can be accomplished by means of diagnostic peritoneal lavage or the focused assessment with sonography for trauma (FAST). Radiographic studies of the abdomen are indicated in stable patient when physical examination are inconclusive. Plain abdominal radiograph in erect position is helpful in hollow visceral injury. Hollow visceral injury shows free air under domes of diaphragm. This was seen in our all 11 bowel injury cases[17].The initial hours of BTA are extremely crucial

and important for patients for saving their lives also called golden period of trauma. Early institutions of proper management results in decreased morbidity and mortality. The most frequently injured organs in blunt abdominal trauma are liver, spleen, intestine, retro peritoneal organs like kidney, pancreas, urinary bladder etc.. In present study, liver was the most common injured organ[2,4]. 27(45%)cases while the second common injured organ in our study was spleen(18(30%) cases)[2,3,4]. This is because liver is largest of all organs and more anteriorly placed, thus more susceptible to injury in blunt trauma[18].. In the present study gastro intestinal tract/hollow viscus organ was 3rd most common injured organ. Total cases were 11(18.3%) and all were operated. In our study small bowel was most common injured hollow viscus organ (8 cases) in which ileum was most frequently involved followed by Jejunum and duodenum. 2 cases of Large bowel injury were reported both of which had Sigmoid colon involvement. Bowel injury most commonly occurs at the junction of fixed and mobile part of the gut thus the terminal ileum was the most common site of injury followed by first part of jejunum and at beginning of sigmoid colon. Mesenteric tear were seen in 3(5%) cases which were associated with small bowel injuries and they were treated operatively. Solid organ injuries with low grade can be managed conservatively with closed monitoring of clinical vitals, based on USG and plain radiography which has high sensitivity. Those patients with stable blood pressure, adequate urine output, maintained abdominal girth and insignificant changes in laboratory investigations were managed conservatively. Conservative management has become an established and accepted management protocol for most BTA injuries. Liver due to its firm texture is more confidently treated by conservative management. Conservative management has a significant decrease in length of hospital stay and morbidity compared to the patient who undergoes surgery. In our study out of 60 cases, 44(73.3%) cases were managed conservatively and 16(26.7%) were operated[19,1]. In the non-operative managed group renal injury was the commonest injury, followed by hepatic and splenic injuries. Patients of renal trauma who were managed conservatively were followed with regular CT scan and other routine investigation. Only one case of intraperitoneal bladder rupture was found in our study. Patient of intra peritoneal urinary bladder injury, managed by laparotomy followed by repair of bladder in two layers done. All 11 cases of hollow viscus injury were managed by exploratory laparotomy. Primary repair, resection and anastomosis, ileostomy/ colostomy was done as per requirement[21]. 3 cases of mesenteric tear associated with small bowel injury were treated as operation. One case of diaphragm injury which was associated with splenic injury was operated. Management of diaphragmatic injury was done by abdominal approach by repair with non absorbable suture[20].Duration of stay in hospital depends on type of care or management of patients like operative or conservative, condition of patient at arrival or after assessment, on blood investigations, blood transfusion. Some unstable patients required longer time to take hemodynamic stability. ICU care, blood transfusion, other deranged blood investigations are responsible for longer duration of stay in hospital. Wound complications are important causes of early and late postoperative morbidity following laparotomy. These are seroma, hematoma, surgical site infection, wound dehiscence or hernia. In our study wound complications occurred in 3 cases out of 16 operated cases. Wound infection was the most common complications after undergoing surgery followed by wound dehiscence in one case [2,31,34]. Wound infections were managed conservatively [22]. The causes of sepsis/infection in these patients were necrotic tissue, mutilating injuries and late presentation in some patients. A primary cause of wound dehiscence is sub-acute infection, resulting from inadequate or imperfect aseptic technique. 3(5%) death occurred out of 60 patients and all 3 were operated. The overall mortality rate in our study was 5% which correlate with many other studies [1,23,24]. The major cause of death was delayed presentation of the patient and poor general condition of the patient at admission. Other were, due to post operative chest and wound infection.

SUMMARY AND CONCLUSION

The result of our study are like other studies. The most common cause of Blunt Trauma Abdomen was road traffic accident followed by fall from height , assault and other injuries like sports, bomb blasts etc. Male were predominantly involved in RTA. Urban areas were mainly involved in RTA. So the better roads, proper traffic sense, adherent to traffic rules (specially to the youth), and planning by urban authorities to carry out the necessary measures (such as pedestrian light, pedestrian overpasses etc.) may reduces the chances of RTA. Liver was the most commonly injured organ after BTA followed by spleen, gut & retroperitoneal organs. In hollow viscus organs, ileum was the most common injured organ mainly terminal part due to junction of fixed and mobile segment of gut. Due to high sensitivity, easy availability & low cost, USG is the main diagnostic tool for diagnosis of blunt trauma abdomen. So clinical examination, USG and assessment of patient in diagnosis of intra abdominal injury and continuous

necessary training for students and staff is recommended. Hospital should be equipped with the basis facilities & it should be thought to provide necessary arrangements for emergency surgeries that will be after rapid diagnosis. Early presentation, early diagnosis and early decision for conservative or surgical intervention and proper, regular post operative care will decrease morbidity and mortality of patients of BTA.

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