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Blunt Trauma Abdomen in Surgical Emergency: A Retrospective Study

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Abstract

Background: Abdominal trauma from Blunt injury is found in most of the patients with polytrauma. For diagnosing Blunt abdominal trauma, we have to keep high index of suspicion and through physical examination and investigations are required. Prompt and proper management in time reduces morbidity and mortality. *Aim:* The aim of this retrospective study was to know the percentage of different organ involvement in Blunt trauma abdomen. As well as to find out types of injury, age group, male to female ratio, operative to conservative ratio and respective outcome. *Material and Methods:* This study is based on 295 cases of Blunt trauma abdomen; managed there from admission, investigation, management and possible follow up. Observations are shown in different tables. *Result:* we found that Liver is the most common organ to get involved in Blunt trauma abdomen. After that comes spleen, kidney and pancreas respectively. Solid organ injuries cases were treated by operative as well as conservatively as per hemodynamic parameters of patients. Operative management of Bowel injuries was done by either repair of perforation or resection and anastomosis of Bowel. Out of 295 patients 53 died because of complication like Hypovolemic shock, septicemia, renal failure and multi organ failure. *Concusion:* Timely diagnosis and proper management reduces mortality after Blunt trauma abdomen. Early management should start from accident site to hospital with close supervision.

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Introduction

Abdominal trauma from Blunt injury is found in most of the patients with polytrauma. For diagnosing Blunt abdominal trauma, we have to keep high index of suspicion and through physical examination and investigations are required. Prompt and proper management in time reduces morbidity and mortality.

This is a retrospective study conducted between January 2013 to December 2017 at a tertiary care center, on patients managed for abdominal blunt trauma due to various causes like road traffic accidents, assaults, fall from height, industrial accident etc. The aim of this study was to know the percentage of different organ involvement in Blunt trauma abdomen. As well as to find out types of injury, age group, male to female ratio, operative to conservative ratio and respective outcome. In road traffic accident after orthopedic and head injuries, Blunt trauma abdomen is the third commonest to be found. Majority of victims of RTA are usually young, productive adults and hence has got enormous socioeconomic impact [1,2]. Blunt injuries are thought to result from adults and a combination of crushing, deforming, stretching and shearing forces. The magnitude of these forces directly related to the rate of acceleration and deceleration and also on their relative direction of impact [3].

In poly trauma victims, abdominal injuries due to blunt trauma often gets unnoticed and undiagnosed leading to delay in treatment of intrabdominal organ or vascular injury increasing morbidity and mortality [4].

Material and Methods

Data were collected of all the patients who have attended and got admitted at our centre between January 2013 to December 2017, with suspicion of Blunt trauma abdomen. Detailed history, age and sex, examination finding, mode of injury, time of trauma to arrival at hospital, investigations, organ involvement, mode of management and outcome and cause of death were studied.

It was made sure that all the patients with suspicion of Blunt trauma abdomen were attended by senior surgeon.

Observation

Two hundred ninety five cases of Blunt trauma abdomen were admitted during our study period. Data from there medical record were collected and analysed. All patients were found to be attended by senior surgeon. Records have shown that in all patients detailed history and clinical examination was done. On suspicion of abdominal injury or on positive finding patients were thoroughly investigated with biochemical investigation like CBC, RFT, LFT, Amylase, Lipase, Urological examination; Radiological examination such as X ray chest, X ray abdomen, USG of whole abdomen and CECT of abdomen were done. Most common presentation was found to be Abdominal pain. Few patients presented with shock along with sign of peritonitis and concealed haemorrhage.

We observed that male to female ratio was 3.75 and most common age group of Blunt trauma abdomen was 30-50yrs (44.7%). It was seen that Liver was most common solid organ to get involved (26.4%) followed by spleen (18.6%). Bowel injuries were mainly found at junction of mobile and fixed portion e.g. first part of jejunum, distal portion of ileum (18.61%) beginning of sigmoid colon and ascending colon (5.7%) and mesentery (4.4%). In our study Bladder injury was significant (4.06%). Out of 295 patients, 134 patients (45.4%) were treated by surgical intervention and 161 patients (54.6%) were treated conservatively. We have found that all bowel injuries were managed by laparotomy with repair of perforation or resection anastomosis. Solid organ injuries were treated by surgery in unstable patients and hemodynamically stable patients were managed conservatively.

Table 1: Sex and age wise distribution

Age group	Male	Female	Total
0-10	7	2	9
11-30	83	19	102
31-50	101	31	132
>50	42	10	52
Total	233	62	295

Table 2: Cause of blunt trauma abdomen

Mode of injury	No. of patients
Moto vehicle accident	200
Fall from height	48
Industrial accident	35
Assault	12
Total	295

Table 2: Organ involvement in blunt trauma abdomen

Organ	Number of cases	Percentage
Liver	78	26.4
Small intestine	55	18.6
Spleen	41	13.8
Large intestine	17	5.7
Mesentery	13	4.4
Kidney	35	11.8
Retro peritoneal hematoma	38	12.8
Diaphragm	3	1.01
Urinary bladder	12	4.06
Pancreas	3	1.01

Table 3: Shows treatment offered

Organ	Total no of cases	surgery	conservative
Liver	78	10	68
Spleen	41	22	19
Kidney	35	2	33
Pancreas	03	-	03
Retro peritoneal	38	-	38
Hollow viscera	85	85	-
Diaphragm	03	03	-
Urinary bladder	12	12	-

Table 4: Shows causes of death

Cause of death	No. of patients
Hypovolemic Shock	22
Septicemia	11
Renal failure	8
Multi organ failure	12
Total	53

Picture 1: Shows mesentery hematoma with small intestine perforation

Out of 295 pts mortality occurred in 53 patients (17.9%). Most common cause of death was Hypovolemic shock followed by septicaemia, renal failure and multi organ failure. Observations of our study shown in following tables.

Discussion

With fast growing industry, increase in traffic and urbanization incidence of injury has increased multiple fold, show there is proportionate increase in cases of Blunt trauma abdomen. These patients require early diagnosis, urgent treatment and different types of approach. Planning and timely intervention is important for better outcome [5]. The golden hours are crucial for patient's survival. Early diagnosis and treatment decreases mortality and morbidity, whereas delay increases mortality of patients. Studies have shown that the single leading cause of hospital admission is Trauma and 15% of all hospital beds are occupied by trauma patients.

Zheng YX et al. had also quoted that Blunt trauma abdomen is third most common form of injury in RTA after orthopaedic injury and head injury and victims are young and productive adult [2]. Similarly in our study we have also found the most common age group admitted for Blunt trauma abdomen are 30-50 years of age. Most common cause of Blunt trauma abdomen is motor vehicle accident similar to studies published by Tripathi and Jolley [6,7]. Next common cause was fall from height. Blunt injuries are supposed to result from combination of shearing forces, stretching, crushing and deforming. The magnitude of injury depends on force, relative direction of impact and rate of acceleration and deacceleration [3]. The symptoms and signs depend on age, general condition, time interval between time of injury and arrival of patient in hospital and also on organ involvement. Most of the patients had abrasion or contusion on right or left flank and abdominal wall.

Due to large size of liver, its relatively fixed position, its friable parenchyma and thin capsule makes it more prone to blunt injury. Right lobe used to get more commonly than left because of its proximity to ribs and larger size. After liver, spleen followed by small intestine, kidney, large intestine, urinary bladder and pancreas are more vulnerable to get involved. We have also noted the Hepatic injury in 26.4% of patients followed by spleen in 13.8% of our study group. Other solid organ involved less in number. With advancement in newer imaging technique it's easy to diagnose extent of intraabdominal organ injury. As per the CT report finding laceration was the most common form of Hepatic injury while subcapsular hematoma and contusion was least common [8].

In last 20 years many report shows conservative management has become an established and accepted management protocol for solid organ injuries in hemodynamically stable patients [9]. Surgical literature shows that 86% of liver injuries have stopped bleeding by the time during surgical exploration is performed [10]. Liver due to its firm texture is more confidently treated by conservatively in hemodynamically stable patients. In other similar studies, around 87% of liver injury in Blunt trauma abdomen were managed conservatively. Those patients with stable blood pressure, adequate urine output, without abdominal distension and tenderness and insignificant changes in laboratory finding were chosen to be managed conservatively. Velmahos G C et al. [11] managed 85% patients of blunt trauma abdomen with spleen injury conservatively, out of which in 8-38% patients they had to convert their management plan to surgery. Whereas in our study, conversion to operative management was 0% out of 19 (46.3%). In a study by Madhumita Mukhopadhyay, according to the CT grading of splenic injuries grade IV and V injuries were treated by laparotomy, while lower grade injuries were managed conservatively. They have documented that splenic salvage rate improved from 67.9% to 72.4% with this protocol and failure of conservative management following the introduction of this protocol is minimal [12].

In our study 161 out of 295 (54.6%) were conservatively managed by complete bed rest, broad spectrum antibiotics, adequate intravenous fluid and adequate analgesia. In Rest 134 patients (45.4%) were surgically managed. Patients with positive findings of bowel injury were operated for repair of perforation and resection anastomosis and ileostomy/colostomy as indicated. Hemodynamically unstable patients with frank sign of exsanguinations need urgent laparotomy [13]. Injury of mobile hollow viscera like stomach, small intestine is relatively uncommon in Blunt trauma abdomen. However, bowel may get injured at junction of mobile and fixed portion e.g. first part of jejunum and distal portion of ileum, beginning of sigmoid and ascending colon [14]. Out of 295 patients of Blunt trauma abdomen mesentery tear found alone in 13 cases (4.4%). We have found in 3 cases (1.01%) Left sided diaphragmatic injury. Numerous study has shown a greater incidence of Left sided injury due to location of Lumbo-coastal trigone on left side and protective effect of liver on right side [15]. Diaphragmatic injury were treated surgically by repair with nonabsorbable suture by abdominal approach. In genito-urinary system kidney (11.8%) was found to be the most common organ to get injured in blunt trauma abdomen, followed by urinary bladder (4.06%). Retroperitoneal hematoma was found in 12.8% of study group.

Conservative management has a significant decrease in length of hospital stay and morbidity compared to the patient who under goes surgery. Conservative management had certain drawbacks like need of ICU care and its related problems, delay in diagnosis and

management of missed bowel perforation and vascular injuries [16]. But by aid of newer diagnostic equipment and being careful and meticulous in selecting patients for conservative management, we can overcome this. The overall Mortality was 17.9%, which is slightly higher than data of various studies from India where mortality was 6 to 9%. Most common cause of mortality was hypovolemic shock followed by septicaemia, renal failure and multi organ failure. Patients may collapse or die without any visible injury following blunt trauma abdomen due to vaso-vagal inhibition through plexuses present in posterior wall of upper abdomen.

Conclusion

Road traffic accident was the most common cause of Blunt trauma abdomen mainly effecting young age group with male predominance. Liver was the most common intra-abdominal organ to get injured followed by spleen, and hollow viscera. While managing patients of blunt trauma abdomen we should have high index of suspicion. Early and accurate diagnosis and prompt treatment improve overall prognosis. Conservative management in hemodynamic stable patients give better result whereas patients with hollow viscus injury should be treated surgically. Better road, adherence traffic rule, road safety week programs for public has reduces the chance of road traffic accident and therefore Blunt trauma abdomen. Improvement of ambulance services and development of various trauma centre will increase survival rate of victims by fast transportation and early institution of treatment.

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