



## A STUDY ON PATTERN OF BLUNT ABDOMINAL TRAUMA AND ITS OUTCOME FOLLOWING NON OPERATIVE MANAGEMENT

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### ABSTRACT

**INTRODUCTION:** Abdomen is the third most commonly injured part of the body following injuries to extremities and head. Blunt injury remains to be the most prevailing mode of abdominal injury. Motor vehicle accidents are the most common mode to cause Blunt abdominal trauma. Evolving imaging modalities like FAST, CT scans have resulted in significant shift from surgical to more selective conservative management of blunt injury abdomen.

**MATERIALS AND METHODS:** This is a prospective study of selected cases of Blunt injury abdomen managed in the Department of General Surgery in Rajah Muthiah Medical College and Hospital (RMMCH) during the period from September 2019 to October 2021.

**AIMS AND OBJECTIVES:** The current study establishes the incidence and demographic distribution of patients who have sustained blunt abdominal trauma, also gives an outline which type of patient will benefit conservative management and detects downfalls of surgical and conservative management and identifies the causes of failure of Non operative management following blunt injury abdomen.

**RESULTS:** In our study males were more commonly affected than females in the ratio 4:1 and age group involved ranging from 4 years to 69 years, majority were in second, third, fourth decades taking a toll of 71.25% of patients.

The common presentations in these victims were abdominal pain, tenderness, diffuse guarding, rigidity, abdominal distention, sluggish/absent bowel sounds, pallor, hypotension with features of shock.

In unstable patients to detect hemoperitoneum, ultrasonography/FAST was a very helpful mode of investigation. But, it missed 3 cases with kidney injury, 5 cases with liver injury, and 9 cases with splenic injury. It is not an imaging of choice to detect bowel, kidney, pancreas and mesenteric injuries.

CECT abdomen is the investigation of choice to grade the organ injuries. 37 patients with splenic injuries were identified by CT abdomen, of which 29 were managed conservatively.

CT abdomen detected liver injuries in 21 patients, of which 16 were managed conservatively. Kidney injuries were picked up in 5 patients with help of CT abdomen and all were subjected to conservative management.

**MANAGEMENT:** From a total of 100 patients studied, 64 patients were selected for conservative management after initial resuscitation. Most common organ to get involved following Blunt abdominal trauma is Spleen (37%), followed by liver (21%), mesentery, small bowel and bladder. Out of 37 patients with splenic injuries, 29 were managed conservatively. 16 cases with isolated hepatic injury, 5 cases with kidney injury, 2 cases with bladder injury, 2 patients with mesenteric injury and one patient with pancreatic injury were managed conservatively.

**Morbidity and mortality:** Mortality was not observed in patients subjected to conservative management. A total of 4 cases died in the operative group. Two patients due to pancreatic head transection, one due to associated head injury, one due to delayed hospitalization. The duration of hospitalization in patients who were managed conservatively ranged from 9-11 days and 14-20 days in patients who underwent surgery. One patient developed pseudocyst of pancreas following pancreatic injury and another patient developed clot retention following conservative management for bladder injury. The causes of failure of non operative management in patients with blunt abdominal trauma were patients with pancreatic head transection, ongoing hemorrhage/features of peritonitis with hemoperitoneum and hollow viscus perforation.

**CONCLUSION:** The success rates following conservative management of solid organ injuries after blunt injury abdomen have been increasing and it is quite challenging also, since it requires close observation by experienced surgeon and there is a narrow line to choose the line of management (conservative / surgical) for better outcome.

Involvement of multiple intra abdominal organs, other associated extra abdominal injuries, coexisting comorbid diseases and late presentation following injury increases the morbidity and mortality.

Ultimately early diagnosis, aggressive adequate resuscitation and timely surgical intervention when needed in severely injured patients may boost the outcome in these patients who have failed conservative management.

**KEYWORDS :** Blunt injury abdomen, Motor Vehicle accidents (MVA's), Solid organ injury, Hollow viscus perforation, FAST, USG, CT, Conservative management, Surgical management.

### INTRODUCTION:

With the advancement in the field of science and technology, the morbidity and mortality due to trauma has increased tremendously. Motor vehicle accidents (MVA's) are a major public health issue in developing world. It is one of the prime

cause of death, disability and hospitalizations which has caused major socioeconomic burden across the world. According to Centres for Disease Control and Prevention (CDC), trauma is the third most common cause of death overall and leading cause of death and disability in the first

four decades of life.

Abdomen is the third most commonly injured part of the body following injury to extremities and head. Blunt injury remains to be the most prevailing mode of abdominal injury. MVA's are the most common mode to cause Blunt abdominal trauma (Gackowski W et al 1997)<sup>[2]</sup>. It has become a challenging task for the surgeons because of its varied presentation. This is because, solid organs are commonly injured, that bleeds slowly, therefore the peritoneal signs may be absent in initial few hours. Concealed hemorrhage is the second most common cause of death following blunt injury abdomen. So meticulous and adequate vigilant observation and early institution of management results in decreased morbidity and mortality. Late diagnosis is a frequent cause of morbidity and late mortality.

The two major and dreadful complications of abdominal trauma are hemorrhage and sepsis. Hemorrhage is the cause for early mortality. Most common solid organ injured following blunt abdominal trauma is spleen followed by liver. The cause for late death after 48 hours following abdominal trauma is sepsis. This occurs as a result of spillage of gastrointestinal contents into peritoneal cavity following hollow viscus injury, which is the usual cause of intra-abdominal sepsis and it occurs commonly with penetrating trauma.

With the use of various diagnostic modalities like FAST and CT scans and with improvement in diagnostic and therapeutic intervention, there is a significant shift from surgical to more selective conservative management of blunt abdominal trauma.

This is a prospective study of selected cases of Blunt injury abdomen managed in the Department of General Surgery Rajah Muthaih Medical College and Hospital (RMMCH) during the period from September 2019 to October 2021. This study tells about the expected complications and downfalls of non operative management of Blunt injury abdomen.

#### **Aims and objectives:**

1. To analyse the epidemiologic and demographic distribution of blunt abdominal trauma in patients admitted in RMMCH casualty.
2. To evaluate different organ systems involved and severity of organ injury following blunt abdominal trauma.
3. To decide which type of patient sustained blunt injury will benefit and effectively be managed by non surgical management.
4. To detect the downfalls of surgical management in comparison with non surgical management.
5. To detect the causes of failure of non operative management following blunt abdominal trauma

#### **MATERIALS AND METHODS:**

##### **Materials:**

**Study Design:** Prospective study

**Study Population:** Patients with history of blunt injury to abdomen or suspected blunt injury to abdomen admitted in RMMCH casualty.

**Study Period:** September 2019 - October 2021

**Study Sample:** 100 patients

Patients were filtered through predetermined inclusion and exclusion criteria. Informed consent was obtained from all participants with importance given to non surgical management based on clinical examination and radiological findings.

##### **Patient selection criteria:**

##### **Inclusion Criteria:**

1. Patients of all age groups and both sexes were included in

this study

2. All patients with Blunt injury abdomen because of various causes like Motor Vehicle Accidents (MVA's), fall from height, H/o assault with blunt and heavy object over the abdomen.
3. Patient with clinical suspicion of injury to abdomen.
4. Injury occurring during natural disaster.

##### **Exclusion Criteria:**

1. Patient who had sustained penetrating injury to abdomen (like gunshot injuries and stab injury).
2. Not given consent for the study.

##### **METHODS:**

After admission, these patients, who have met the inclusion and exclusion criteria, were evaluated after adequate resuscitation. A comprehensive detailed history and thorough clinical examination was done to achieve a provisional diagnosis regarding type of injury. All other associated injuries were noted.

##### **Primary survey:**

Primary Survey was done initially and after adequate initial resuscitation, all patients were subjected to examination.

- General physical examination
- Abdominal examination and other system examination.
- Examination of other associated injuries.

##### **General Physical examination:**

Attention was given to life supportive measures like to secure airway, breathing, circulation and control of shock and hemorrhage and presence of any disability

- Pulse rate, blood pressure, Respiratory rate, oxygen saturation were monitored meticulously and at frequent intervals.
- Examined for pallor, icterus, cyanosis and capillary refill time were noted.

##### **Abdominal examination:**

After inspection of superficial thoracic and abdominal injuries, abdomen was examined thoroughly for signs of internal injury like abdominal tenderness, guarding, rigidity, distention, rebound tenderness (Blumberg's sign), Ballance's sign, Gray Turner sign, Cullen sign, Fox's sign. Examined for presence of free fluid in the abdomen and bowel sounds. Genitals were examined for external injuries, Bryant sign. Digital rectal examination was done to rule out bleeding per rectum or any injury to distal part of colon. All external injuries that were present, were managed accordingly. All patients were provided tetanus toxoid, human anti-tetanus immunoglobulin and antibiotics. The decision for conservative or operative management was based on clinical examination, general condition of the patient, hemodynamic status, and findings of radiological investigations.

##### **Resuscitation:**

Along with the examination, the following resuscitative measures were carried out simultaneously.

- Maintenance of airway with oro-pharyngeal airway or endo-tracheal intubation if needed.
- Blood samples were collected and sent for necessary investigations. Wide bore intravenous cannula was secured and fluid resuscitation was started immediately. Blood and blood products transfusion were done when needed.
- Nasogastric tube inserted to decompress the stomach.
- Intercostal chest tube insertion done in patients with associated chest injury with hemo-pneumothorax.
- Tracheostomy was done in patients with associated laryngeal and facial injuries.
- Per urethral catheterization was done to rule out urinary tract injury and to monitor input and output. Catheterization was not attempted in patients with suspected urethral

injury. Secondary survey was carried out to evaluate other systemic injuries and for abdominal injuries which was missed in primary survey.

**Investigations:**

- Following investigations were carried out in all cases:
- Blood for hemoglobin, PCV, DC, TLC, Blood grouping and typing and cross matching.
  - Plain x-ray of chest with abdomen and other parts for associated injuries.
  - Ultrasonography and CT abdomen were taken for hemodynamically stable and selected patients for favourable diagnosis and management.
  - Diagnostic peritoneal tapping/ lavage using peritoneal dialysis catheter was done to look for presence of blood and the peritoneal fluid was sent for analysis.

Non-clotted blood in aspirate suggests the presence of haemoperitoneum. The perfusate obtained was sent for laboratory analysis for RBC, WBC, Amylase, and Alkaline Phosphatase. Gram staining was performed to look for presence of bacteria. The fluid was also examined for presence of GIT contents and bile.

**Management:**

**Conservative:**

After clinical and radiological examinations, selected patient population were subjected to conservative management. Patients were kept nil per oral and started on IV fluid therapy, IV antibiotics, analgesics. Patients were managed in intensive care unit. Vitals, abdominal girth, input ,output were monitored frequently and meticulously with repeated clinical assessment. Blood parameters were assessed regularly. When needed, proceeded with laparotomy.

**Laparotomy:**

Laparotomy was done by midline incision and appropriate management as for the injury was done.

**Observation and Discussion:**

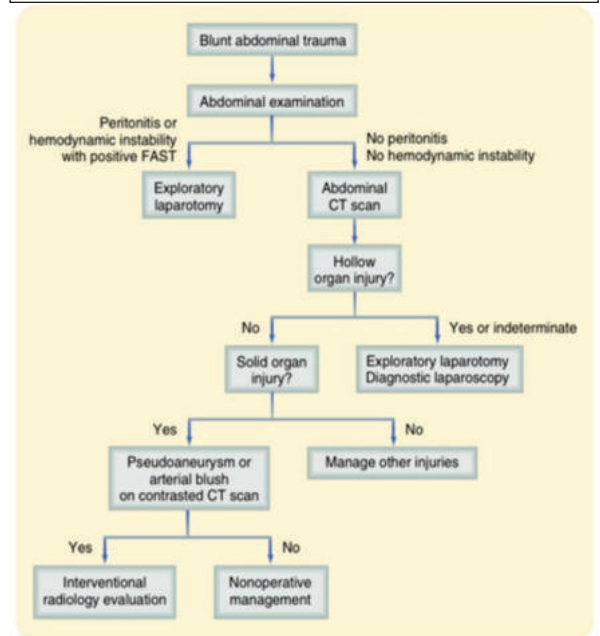
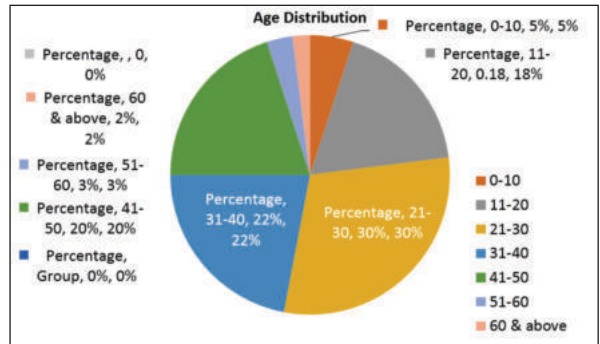
The incidence of blunt injury abdomen was 0.88% of all patients admitted in the Department of General surgery.

**Age:** In our study, it was noted that the patient age group varied between 5 years to 75 years. Most of them (70%) fall in the age group between 11-40 years and only 25% were in the age group above 40 years. Bag Well (1980)<sup>16</sup> observed 56% patients in the age group between 35-61 years. The incidence observed in this series was comparable to our study.

**Sex:** The male and female patients were 87% and 13% respectively. The male patient incidence was found to be 80% and 82% respectively in a study conducted by Canty TG (1999)<sup>12</sup> and Davis (1976)<sup>18</sup>. Inference from the above studied suggest that, male population were commonly involved compared to female because,they were more exposed to outdoor activity with longer outdoor life in comparison to females. The finding is well marked among Indian females who usually confine themselves to the indoor.

**Table-1: Age and Sex Distribution (N= 100)**

Age Group (Year)	Male	Female	Total no. of cases	Percentage
0-10	03	02	05	5 %
11-20	16	02	18	18%
21-30	25	5	30	30%
31-40	20	2	22	22 %
41-50	19	1	20	20 %
51-60	2	1	3	3 %
60 & above	2	-	2	2 %
Total	87	13	100	100 %



**Spectrum of Blunt Abdominal injury:**

A large number of our patients (74%) sustained motor vehicle accidents either as an occupant of vehicle or as a pedestrian, 14% due to fall from height, 7% due to blunt injury to abdomen and 5% due to attack by animals. In the study of Cifticetal (1998)<sup>19</sup> and Davis<sup>18</sup>, Motor vehicle accidents were 60% and 70% respectively, this is comparable with this study.

**Clinical Manifestations:**

In this series, the clinical presentations were abdominal pain and tenderness (78% and 70% respectively) either with or without external bruise or injury at the site of blunt blow, followed by guarding and abdominal rigidity in 65% cases, abdominal distention in 45% cases. Very few patients presented with pallor (34%), absent bowel sound(40%), vomiting (12%).

These were comparable with the study of Nwabrinke T et al<sup>20</sup> with tenderness 69%, pain 52%, rigidity 25%, abdominal distention 48%, pallor 37%.

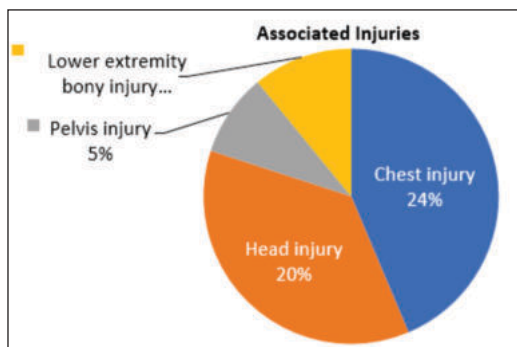
**Other associated Injuries:**

In our study, the commonly associated injuries were chest injury (24%), head injury (20%) & pelvic injury (5%). Davis<sup>18</sup> in his study which involved a total of 437 patients of blunt abdominal trauma, 27% cases had associated chest injuries & 9.2% patients had sustained head injuries along with blunt injury to abdomen. This is comparable to this study.

**Table-2: Associated Injuries**

Associated injuries	No. of cases	Percentage
Chest injury	24	24 %
Head injury	20	20 %

Pelvis injury	05	05 %
Lower extremity bony injury	06	06 %



**Ultrasound of abdomen and FAST:**

Following primary survey, secondary survey and resuscitation, Ultrasound of abdomen and pelvis/ FAST was performed in 80 cases based on their general condition and hemodynamic status. The most common finding was free fluid in the peritoneal cavity observed in 47 (58.75%) cases followed by splenic injury seen in 28(35%) cases, either in the stage of splenic sub capsular hematoma or with splenic capsular tear or peri splenic collection. Ultrasound abdomen missed grade I splenic injuries in 6 patients and grade II splenic injuries in 3 patients who sustained blunt injury abdomen. It picked up all grade III splenic injuries. This suggests that Ultrasound abdomen for blunt abdominal injury has got poor sensitivity for detecting grade I and II splenic injuries

USG abdomen missed 4 patients with grade I liver injury and one patient with grade II liver injury out of 16 patients with suspected liver injuries following blunt injury abdomen.

Ultrasound abdomen picked up 3 cases with kidney injuries, while missed one patient with grade I kidney injury and one patient with grade II kidney injury. Pancreatic injuries could not be detected by Ultrasound abdomen due to ongoing hemorrhage and hemoperitoneum and over lapping of bowel loops.

However Ultrasound abdomen is subjective. FAST helps to take early decision and outlines which type of patient will benefit from exploration to control hemorrhage .Patients with negative FAST are not at considerable risk for hemorrhage and can be evaluated in a less urgent manner. The major drawback of ultrasonography abdomen was its failure to identify nature of fluid, difficulty due to overlying bowel gas shadows, and could not adequately grade the solid organ injury.

This study revealed that Ultrasound abdomen / FAST is a sensitive tool to find out haemoperitoneum. This suggests that in the absence of haemoperitoneum immediate operative intervention is not needed. In 220 patients with blunt injury abdomen, a study conducted by Brain IM et al<sup>21</sup> in which Ultrasound abdomen had a sensitivity of 82.7% and specificity of 89 %.

Studies assessing the FAST technique for detecting haemoperitoneum report sensitivities from 63% to 98% and specificities above 90%. Ultrasound abdomen is ineffective to localise specific organ injury, sensitivities varying from 44% to 73% for all organ injuries. Injuries to solid organ like spleen and liver, are more precisely detected using USG than bowel and mesenteric injuries. Parenchymal injuries to spleen can be picked up better by USG in comparison to injuries to liver.

Intraabdominal injuries cannot be ruled out when the USG abdomen shows negative findings in patients with blunt injury abdomen.

**CECT abdomen:**

In this study abdominal CT was performed in selected cases where Ultrasound abdomen findings were uncertain. The major role of abdominal CT in this study was to find out findings missed in USG abdomen and to grade injuries in hemodynamically stable cases so that the management options i.e.surgical or non surgical could be decided.

63 cases underwent abdominal CT in which the commonly injured organ was spleen (37 cases). Ultrasound abdomen could not detect splenic injuries in 9 patients. 29 patients were put conservatively and 2 patients with splenic injuries were managed by splenectomy, one due to features of intra peritoneal hemorrhage and another due to associated mesenteric injury.

CT abdomen also picked up 21 patients with liver injuries, out of which 5 were missed by ultrasound abdomen.16 patients were managed conservatively. A total of 5 patients with kidney injuries was diagnosed in CT abdomen. Out of 5 patients with kidney injuries, USG abdomen missed two cases, which were picked up in CT abdomen.

In this study, CT abdomen was not done in patients with suspected hollow viscus injury which was diagnosed on laparotomy.

Many studies across the world reported that CT abdomen has sensitivity and specificity consistently above 90%. Sensitivity of CECT abdomen to pick up solid organ injuries is greater than 97% while for hollow viscus it varies from 64 % to 90%. CT abdomen is less accurate for hollow viscus and mesenteric injuries. Shorter scanning time is an advantage of helical CT. In a study conducted by Buzzas GR 1998<sup>22</sup> showed that the CECT abdomen had a sensitivity of 79.5% and specificity of 99.3% in identifying blunt injuries to abdomen. By excluding hollow viscus injuries the sensitivity of CT abdomen increased. In patients with blunt injury abdomen undergoing emergency CT abdomen, the CT abdomen had sensitivity between 92% and 97.6% and specificity as high as 98.7%<sup>23,24</sup>.

Most surgeons advice admission and close monitoring after negative findings in CT abdomen<sup>25,26</sup>. In a study involving 2,774 patients, the authors interpreted that the negative predictive value (99.63%) of CT scan for blunt injury abdomen was highly sufficient to allow safe discharge of patients with blunt injury abdomen after negative finding in CT abdomen<sup>27</sup>.

**Visceral Involvement:**

The most common solid organ to get involved is spleen (37% cases), followed by liver (21% cases), mesentery, small bowel and bladder.

**Table – 3: Visceral involvement**

Organ	Present study (n=100)	Cox EF 1984 in n=870	Dais et al 1976 n=437
Spleen	37	42.6	20
Liver	21	35.6	29
Pancreas	02	-	-
Kidney	05	2.6	-
Small intestine	18	4.7	15
Stomach & duodenum	02	-	0
Large intestine	03	<0.1	-
Mesentery.	11	-	7
Urinary bladder	02	3.2	29

The pattern of visceral injuries is similar to our study with slight variation in comparison with the above study.

**Management:**

From a total of 100 patients studied, 64 patients were selected for

conservative management after initial resuscitation. They were managed conservatively with Nil Per Oral regime, Nasogastric decompression and aspiration, IV fluids, IV antibiotics, appropriate analgesics with frequent regular physical examination and meticulous vitals monitoring. Laparotomy was performed in 36 patients with definite indication for surgery. In 28 patients, early laparotomy was done within 12 hours after presenting to the hospital and for remaining cases laparotomy was performed after 12 hours, where abdominal signs of organ injury appeared late which was confirmed by clinical examination and radiological investigations. A total of 70 patients were managed conservatively, four patients with splenic injury and two patients with liver injury underwent surgery because they developed features of peritonitis and there was ongoing hemorrhage. Patients with bowel and mesenteric injuries required surgical management.

**Table-10: Conservative Vs Operative**

Organ	Conservative	Operative
Spleen	29	8
Liver	16	5
Pancreas	2	0
Kidney	05	0
Small intestine	0	20
Stomach & duodenum	0	2
Large intestine	0	3
Mesentery	3	08
Urinary bladder	01	02

**Spleen:**

Spleen salvaging procedures were recommended by James et al (1999), Cathey KL et al (1998)<sup>14</sup> and many other authors to circumvent complications like OPSI (Overwhelming Post Splenectomy Infection).

In this study 29 patients (74.28%) with splenic injuries following blunt abdominal trauma were conservatively managed. It is possible to manage splenic injury following blunt injury abdomen conservatively in 80% patients showed in study conducted by S.P Stawicki et al<sup>5</sup>.

Non operative management was achievable in 100 %, 73.68% and 64% of grade I, grade II and grade III injuries respectively.

**Table IV: Management of Splenic Injury**

Grade of splenic injury	Non surgical	surgical	Total	% (consv./total *100)
Grade I	8	-	8	100%
Grade II	14	2	16	87.5%
Grade III	6	3	9	66.6%
Grade IV &V	4	4	4	0
Total	28	9	37	75.67%

**Liver:**

80-90% cases of all blunt injuries to liver can be managed conservatively evident in studies conducted by Richardson JD.(2008)<sup>23</sup>, Pachter HL et al(2000)<sup>30</sup>, Cuff RF et al (2000)<sup>31</sup>. In this study, 76.16% of blunt injuries to liver were managed conservatively that is comparable with the above studies.

In patients with isolated liver injuries, 91.5% of grade I and II injuries, 79% of grade III, 72.8% of grade 4, and 62.6% of grade 5 injuries were managed well by conservative treatment. Hence, high grade injuries to liver can be managed conservatively without surgical intervention. Emphasis on conservative management of liver injuries in 80% of cases following blunt injury abdomen was laid by S.P. Stawicki et al<sup>28</sup>.

**Table V Management of Liver Injury**

Grade	Conservative	Operative	Total	% (consv./total *100)
Grade I	9	-	9	100%
Grade II	7	2	9	77.77%
Grade III	-	3	9	0
Total	16	5	21	76.19%

**Kidney:**

In a study conducted by Matthews LA et al<sup>33</sup>, which included 126 patients with blunt injury to kidney, 90% were treated conservatively. In this study, all cases with blunt injury to kidney were conservatively managed.

Five patients with blunt injury to kidney were included in this study and all five patients were successfully managed conservatively because they were associated with isolated Grade I and Grade II kidney injuries.

In a study conducted by Goff et al, which included 55 cases (99%) who have sustained blunt renal injury, 38% of hemodynamically unstable patients and 69% of hemodynamically stable patients were managed conservatively.

**Pancreatic Injury:**

Only one patient with pancreatic injury (contusion), following blunt abdominal trauma was managed non operatively. This patient later developed pseudocyst of pancreas after 6 weeks later which was managed conservatively.

**Urinary Bladder Injury:**

In many studies, patients who had sustained urinary bladder injury, the outcome following operative and non operative management were found to be similar. In this study, one patient with extra peritoneal bladder injury was managed conservatively with catheter drainage and recovered successfully and remaining two cases with intra peritoneal bladder injury were subjected to operative management. Out of 58 patients with extra peritoneal bladder injury, 39 patients were managed by catheter drainage in a study series conducted by Corriere JN Jr. The author stated that extra peritoneal bladder injuries may be treated conservatively with simple catheter drainage if it is not associated with other injuries requiring exploration. This is comparable with this study.

**Stomach and Duodenum injury:**

Two cases were included in this study, one stomach and one duodenal injury. They were identified intra operatively and repaired. CECT abdomen failed to identify both the injuries. There was no mortality in this group. Stomach and duodenal contusion can be managed non operatively when they are identified in CECT abdomen with oral contrast after ruling out follow viscus perforation.

**Small Intestine injury:**

In this study 18 patients sustained injury to small bowel, injuries ranging from perforation to complete transection of bowel and they were subjected to operative management. On the other hand, bowel contusions were managed conservatively after ruling out perforation by CECT abdomen with oral contrast.

**Colon Injury:**

In this study, 11 patients had colonic injuries and were managed operatively based on clinico-radiological findings. One patient died due to associated multiple organ injuries.

**Mesenteric Injury:**

11 patients had mesenteric injuries. One patient had mesenteric laceration and was operated. One patient had hematoma in the mesentery, which was evident in CT abdomen and was managed conservatively. The remaining 9 patients had positive DPL/ Paracentesis with features of ongoing hemorrhage and they were managed by surgical intervention. Out of 9 patients who underwent surgery, three died due to associated injuries to other abdominal organs.

**Morbidity and mortality:**

Mortality was not observed in patients subjected to conservative management. A total of 4 cases died in the operative group. Two patients due to pancreatic head

transection, one due to associated head injury, one due to delayed hospitalization. The duration of hospitalization in patients who were managed conservatively ranged from 9-11 days and 14-20 days in patients who underwent surgery. One patient developed pseudocyst of pancreas following pancreatic injury and another patient developed clot retention following conservative management for bladder injury. The necessity of antibiotic prophylaxis and the incidence of pulmonary complications were low and there was early return of GI function in patients who were managed conservatively.

#### Causes of Failure of Conservative Management:

These were the causes of failure of non operative management in patients with blunt abdominal trauma

- Pancreatic head transection
- On going hemorrhage/ features of peritonitis with hemoperitoneum
- Hollow viscus perforations
- Mesenteric laceration
- Associated injuries like head injury

#### CONCLUSION:

The success rates following conservative management of solid organ injuries after blunt injury abdomen have been increasing and it is quite challenging also, since it requires close observation by experienced surgeons and there is a narrow line to choose the line of management (conservative / surgical) for better outcome. The current study establishes the incidence and demographic distribution of patients who have sustained blunt abdominal trauma, also gives an outline about which type of patient will benefit conservative management and detects downfalls of surgical and conservative management and identifies the causes of failure of non operative management. The evolution of imaging techniques has decreased the surgeon's operative burden. Involvement of multiple intra abdominal organs, other associated extra abdominal injuries, coexisting comorbid diseases and late presentation following injury increases the morbidity and mortality.

Ultimately early diagnosis, aggressive adequate resuscitation and timely surgical intervention when needed in severely injured patients may boost the outcome in these patients who have failed conservative management.

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