

Original Research Article

Solid organ injury in blunt trauma abdomen: an etiological evaluation and success rate of non-operative management

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ABSTRACT

Background: Trauma remains the most common cause of death for all individuals between the ages of 1 and 44 years. 10% of these fatalities are attributable to abdominal injury. The Indian fatality rates for trauma are 20 times that for developed countries. The management of patients with blunt abdominal injury has evolved greatly over the last few decades from complete surgical management historically to present non operative management in most of the cases. In view of increasing number of road traffic accidents, rampant increase in construction work, accidental fall from height, this study is conducted to look into the causes of such incidents and also to strengthen the already established rules of non operative management in cases of blunt trauma abdomen.

Methods: This is a prospective study of 53 patients who presented to K. R. Hospital, Mysuru, Karnataka, for management of blunt trauma abdomen over the period of January 2016 to June 2017. Unstable patients with initial resuscitation underwent Focused Assessment Sonography for Trauma. Failed resuscitation with free fluid in abdomen confirmed by FAST immediately shifted to operation theatre for laparotomy and proceed. Hemodynamically stable patients underwent computerized tomography of abdomen. Organ injuries were scaled according to the American Association for the Surgery of Trauma and these patients were managed conservatively after ruling out hollow viscus perforation.

Results: Majority of the patients belonged to male sex (85%) and of the age group 21-40 years constituting 58.3% of patients. Road traffic accident was the most common mode of injury which included 35 patients (66%). A total of 19 cases had splenic injury out of which 13 (68.5%) underwent non operative management and 6 (31%) underwent emergency Splenectomy. liver injury was present in 15 patients and all were managed conservatively. In total non operative management was done in 73.5% of cases and surgical management was done in 26.5% of cases.

Conclusions: The presence of free fluid with organ injury always does not mandate laparotomy. Patient selection, early diagnosis and repeated clinical examination and use of appropriate investigations forms the key in non operative management of blunt trauma abdomen. RTA being the most common mode of injury, adequate measures should be taken to prevent road traffic accidents by strict action and traffic norms and citizen education.

Keywords: Blunt trauma abdomen, Road traffic accident, Non operative management

INTRODUCTION

The importance of the modern day epidemic of motor vehicle accidents to the global epidemic of violent injury cannot be overstated. Trauma remains the most common cause of death for all individuals between the ages of 1

and 44 years and is the third most common cause of death regardless of age.¹ It is also the number one cause of years of productive life lost. 10% of these fatalities are attributable to abdominal injury.² The Indian fatality rates for trauma are 20 times that for developed countries. The frequency of intra-abdominal injuries continues to increase worldwide.^{3,4}

The management of patients with blunt abdominal injury has evolved greatly over the last few decades. Historically, surgical management was the preferential treatment for most blunt abdominal injuries, because non-operative management (NOM) was associated with a high mortality rate and significant risk of delayed rupture.⁵ However, a significant amount of the laparotomies were non-therapeutic and therefore possibly unnecessary.⁶ Furthermore, as the severity of post-splenectomy infection became better understood, a trend from splenectomy towards splenic conservation has emerged. The trend of NOM first started after a remarkable study report from the paediatric surgeons from the hospital for sick children in Toronto in 1978 who conservatively managed children with splenic injuries.⁷

Although initially controversial, non-operative management of patients with blunt abdominal injury is currently the treatment of choice in hemodynamically stable patients.⁸⁻¹⁰ Non-operative management can be divided in either observation alone or angiography and embolization followed by close observation.

In view of increasing number of vehicle, consequent increase in road traffic accidents, rampant increase in construction work, accidental fall from height, this study is conducted to look into the causes of such incidents and also to strengthen the already established rules of NOM in cases of blunt trauma abdomen.

METHODS

This is a prospective study of 53 patients who presented to K. R. Hospital, Mysuru, Karnataka, for management of blunt trauma abdomen over the period of January 2016 to June 2017.

During this study period 53 patients admitted with blunt trauma to abdomen.

Initial priority was given to maintain airway, circulation and breathing with emphasis on vitals like temperature, pulse rate, blood pressure and respiratory rate and resuscitative measures were done. Furthermore a detailed history and clinical examination was done with secondary survey for any associated injuries.

Unstable patients with initial resuscitation underwent Focused Assessment Sonography for Trauma (FAST). Failed resuscitation with free fluid in abdomen confirmed by FAST immediately shifted to operation theatre for laparotomy and proceed.

Hemodynamically stable patients underwent Computerized tomography of abdomen (CT scan). Organ injuries were scaled according to The American Association for the Surgery of Trauma (AAST) and these patients were managed conservatively after ruling out hollow viscus perforation and other system involvement.

These patients were kept under close observation with vitals monitoring and serial haemoglobin estimation. Any deterioration in general condition, patient is considered for operative management.

RESULTS

Current study constituted majority of male sex than female. Forty five patients were male (85%) as compared to 8 female (15%) (Figure 1).

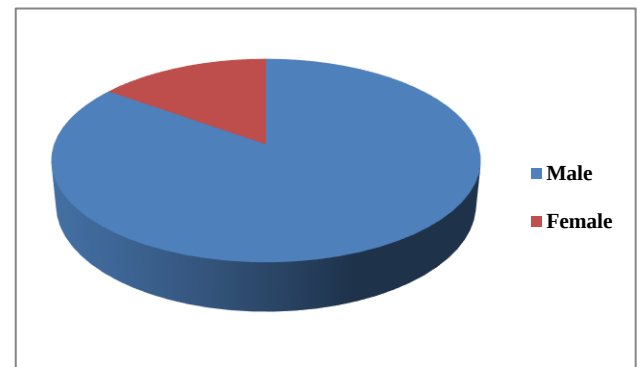


Figure 1: Sex-distribution of patients.

Majority of patients who presented with blunt trauma to abdomen belonged to the age group of 21-30 years (30%) followed by 31-40 years (28.3%) together constituting 58.3% of the patients (Table 1).

Table 1: Age-distribution of the patients.

Age	Number of patients	Percentage (%)
1-10 years	0	0
11-20 years	5	9.5
21-30 years	16	30
31-40 years	15	28.3
41-50 years	7	13.2
>50 years	10	19

Road traffic accident (RTA) was the most common mode of injury which included 35 patients (66%) followed by self fall (15%) and assault (13.2%). Three of the patient included in the study had injury due to elephant attack (Table 2).

Table 2: Mode of injury.

Mode	Number of cases	Percentage (%)
RTA	35	66
Self fall	8	15
Assault	7	13.2
Others*	3	5.7

*Others include patients injured due to elephant attack.

A total of 19 cases had splenic injury out of which 13 (68.5%) underwent NOM and 6 (31%) underwent emergency splenectomy.

Liver injury was present in 15 cases and all were managed conservatively. Kidney injury was present in 6 cases, 3 (50%) underwent emergency nephrectomy and 3 (50%) managed conservatively.

Hollow viscus perforation was present in 6 cases, all of which underwent surgical repair. There was each case of mesenteric tear, rectus sheath hematoma, retroperitoneal hemorrhage which was managed surgically.

One case of pancreatic injury was present which was managed conservatively (Table 3). More than one organ injury was present in 4 cases, one patient has grade 4 splenic injury with shattered right kidney, who underwent emergency Splenectomy with right Nephrectomy. Rest 3 cases had splenic with hepatic injury which was managed conservatively.

In total out of 53 patients admitted, NOM was done in 73.5% of cases and surgical management was done in 26.5% of cases (Table 4).

Table 3: Organ involved and their management.

Organs involved	No. of cases	Operative management	Non-operative management
Spleen	19 (35.8)	6 (31.5)	13 (68.5)
Liver	15 (28.3)	0 (0)	15 (100)
Kidney	6 (11.3)	3 (50)	3 (50)
Hollow viscus perforation	6 (11.3)	6 (100)	0 (0)
Pancreas	1 (1.9)	0 (0)	1 (100)
Mesenteric tear	1 (1.9)	1 (100)	0 (0)
Rectus sheath hematoma	1 (1.9)	1 (100)	0 (0)
Retroperitoneal hemorrhage	1 (1.9)	1 (100)	0 (0)

Numbers in the bracket indicates percentages (%)

Table 4: Operative vs. non-operative management.

Management	Number of cases	Percentage (%)
Operative	14	26.5
Non-operative	39	73.5

DISCUSSION

Blunt Abdominal injury is found to be more common in males and in the age group of 21-30 years. The NOM is being consistently followed for hemodynamically stable patients with respect to solid organ injuries. Operative management is determined by vitals of the patient and CT findings.

Most Common mode of injury in our study is Road Traffic Accident constituting 66% of the patients. Khadilkar et al and Mehta et al have studied patients with blunt trauma abdomen, in their study also they have found out RTA being the most common mode of injury.^{11,12}

Spleen is the most common organ involved, followed by liver and kidney.

NOM was carried in majority of the cases accounting for 73.5%. No case of NOM- Failure is present in our current study. NOM poses challenge to Trauma Surgeons on account of varied clinical picture on arrival. Patients with short pre-hospital transport time have initial subtle

clinical features affecting early diagnosis. The patients selected for NOM were,

- Hemodynamically stable or patients who responded to initial fluid replacement.
- CT contrast blush from minor vessels in solid organs were managed by NOM with caution
- After ruling out of hollow viscus injury by absence of free air under diaphragm or oral contrast leak.

These patients were closely monitored in ICU with repeated clinical assessment, serial determination of hemoglobin, hematocrit, WBC and follow up ultrasound/ CT scan.

CONCLUSION

The presence of free fluid with organ injury always does not mandate laprotomy. Appropriate patient selection, early diagnosis and repeated clinical examination and use of appropriate investigations forms the key in NOM of blunt trauma abdominal cases. All hemodynamically stable patients should undergo CT scan abdomen before planning NOM. RTA being the most common mode of injury, adequate measures should be taken to prevent

road traffic accidents by strict action and traffic norms and citizen education regarding safety measures to decrease the burden of these preventable injuries.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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