

A study of incidence and pattern of organ injury and management of blunt trauma to abdomen

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Abstract

Introduction: Blunt trauma to abdominal is one of the leading causes of morbidity and mortality among all age groups. Identification of serious intra abdominal pathology is often challenging. Intestinal disruptions can be due to a variety of types of blunt trauma, with automobile being the most common etiologic agent. **Aims and objective:** To study the incidence and pattern of various organ injury due to blunt trauma to Abdomen and its Management. **Materials and Method:** Total 40 cases of blunt abdominal trauma were enrolled in the present study. Diagnostic laproscopic was performed in all the patients using standard guidelines. Hemodynamic parameters were watched meticulously during the procedure. Postoperatively, the patients were observed for vital parameters, hemoglobin level and return of bowel functions and wound complications. The patients who underwent splenectomy were given vaccination against meaningful, pneumococcal, and H. influenza type B infections. The patients were discharged after return of normal bowel functions, drain removal and ruling out complications if any. The collected data was analyzed and presented with appropriate table and graphs. **Results:** Majority of the patients (75%) in the present study were less than 40 years of age. Majority of the patients were male (80%). The most common mode of injury was road traffic injury (60%) followed by fall (15%) and assault (20%). The incidence of liver trauma was 70% followed by spleen injury (35%). The incidence of small bowel injury was 20% whereas kidney and colon injury was 10% each. 75% patients were managed successively by conservative management. Explorative laprotomy was required in 25% patients. **Conclusion:** Thus we conclude that the highest incidence of blunt abdominal trauma was seen in males in 2nd and 3rd decade of life and was most commonly due to RTA. The liver, spleen and small bowel were the most commonly injured organs. By using diagnostic laproscopy majority of the patients were managed efficiently by conservative management.

Keyword: laprotomy, road traffic accident, liver injury, blunt abdominal trauma.

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INTRODUCTION

Blunt trauma to abdominal is one of the leading causes of morbidity and mortality among all age groups. Identification of serious intra abdominal pathology is often challenging. Intestinal disruptions can be due to a variety of types of blunt trauma, with automobile being

the most common etiologic agent.^{1,2} Many injuries may not manifest during the initial assessment and treatment period. Missed intra-abdominal injuries and concealed hemorrhage are frequent causes of increased morbidity and mortality, especially in patients who survive the initial phase after an injury. Injury to the intra-abdominal structures can be classified into 2 primary mechanisms of injury – compression forces and deceleration forces.³ Compression or concussive forces may result from direct blows or external compression against a fixed object (e.g. lap belt, spinal column). These forces may deform hollow organs and transiently increase intraluminal pressure, resulting in rupture. Deceleration forces cause stretching and linear shearing between relatively fixed and free objects. As bowel loops travel from their mesenteric attachments, thrombosis and mesenteric tears, with resultant splanchnic vessel injuries can result. Whatever the mechanism, early recognition of these lesions can be

difficult. An overlooked bowel injury is very dangerous because of its tremendous infectious potential. Diagnostic tests can be used to evaluate patients with blunt abdominal trauma. These include ultra sonography (US), diagnostic peritoneal lavage (DPL), computed tomography (CT) and diagnostic laparoscopy (DL). Ultra sonography is convenient, cheap and non-invasive. A positive test is defined as evidence of free fluid or solid organ parenchymal injury.⁴ DPL was the diagnostic method of choice for evaluating blunt abdominal injury in the past, but recently has been often replaced by CT imaging.⁵ DPL is an important adjunct in cases where bowel injury is suspected.⁶ Although DPL is sensitive in identifying hemoperitoneum and associated hollow viscus injury, it has been criticized for its higher rate of non-therapeutic laparotomy.⁷ Diagnostic laparoscopy is minimally invasive surgery for the diagnosis of intra-abdominal organ injury in cases of blunt abdominal trauma. The procedure not only enables the direct visualization of large surface areas of intra-abdominal organs and facilitates the diagnosis of specific organ injury but also makes therapeutic intervention possible. It also facilitates the reduction of the rate of negative and non-therapeutic laparotomies. The decision, in favour of surgery of non operative conservative treatment in blunt abdominal trauma, requires a precise diagnosis that is not always possible with imaging techniques. There is great danger that an, injury to the diaphragm or intestines may be over-looked. Indications for exploratory have traditionally been generous, to the extent that up to 41% of exploratory laparotomies turn out to nontherapeutic.⁸

AIMS AND OBJECTIVE

To study the incidence and pattern of various organ injury due to blunt trauma to Abdomen and its Management

MATERIALS AND METHOD

The present study was conducted after receiving the permission from institutional ethical committee. Total 40 cases of blunt abdominal trauma were enrolled in the present study with reference to below mentioned inclusion and exclusion criteria.

Inclusion Criteria

- Patients with blunt abdominal trauma who sustained Hemoperitoneum or Pnueperitoneum and who are positive for Diagnostic peritoneal lavage, FAST or USG studies with relatively stable hemodynamics (Systolic BP > 90 mmHg and urine output > 15 ml/hr)
- Patients of age group between 20 years and 65 years of either sex having

Exclusion Criteria

- Hemodynamically unstable patients e.g. Systolic BP < 90 mm of Hg and urine output <15 ml/hr.
- A clear indication for immediate celiotomy such as frank peritonitis, hemorrhagic shock, evisceration etc.
- Patients with an uncorrectable coagulopathy or uncorrectable hypercapnia.
- History of multiple previous abdominal surgeries.
- Associated severe head injuries like Extra Dual Hematoma pr Sub Dural Hematoma, compound fracture, spine fracture, severe chest trauma with low SpO2 (< 90 %), late pregnancy.
- Patients of blunt abdomen trauma with stable parameters and normal imaging findings.
- Immuno compromised patients.

Informed written consent was obtained from all the enrolled patients. Basic demographic information of all the patients was entered in the pre structured proforma. Detail clinical examination was done in all the patients. Necessary laboratory investigations were done as per requirement and the findings were entered in the proforma. Diagnostic laproscopic was performed in all the patients using standard guidelines. Hemodynamic parameters were watched meticulously during the procedure. Postoperatively, the patients were observed for vital parameters, hemoglobin level and return of bowel functions and wound complications. The patients who underwent splenectomy were given vaccination against meaningful, pneumococcal, and H. influenza type B infections. The patients were discharged after return of normal bowel functions, drain removal and ruling out complications if any. The collected data was analyzed and presented with appropriate table and graphs.

RESULTS

Table 1: Distribution of patients according to demographic parameters

| Variable | No. of patients | Percentage | |
|----------------|-----------------|------------|----|
| Age | 20-30 | 18 | 45 |
| | 31-40 | 12 | 30 |
| | 41-50 | 6 | 15 |
| | 51-60 | 2 | 5 |
| | >60 | 2 | 5 |
| Sex | Male | 32 | 80 |
| | Female | 8 | 20 |
| Mode of injury | RTA | 24 | 60 |
| | Fall | 6 | 15 |
| | Assault | 8 | 20 |
| | Other | 2 | 5 |

It was seen that majority of the patients (75%) in the present study were less than 40 years of age. Majority of the patients were male (80%). The most common mode of

injury was road traffic injury (60%) followed by fall (15%) and assault (20%).

Table 2: Incidence of organ injury in blunt abdominal trauma

| Organ injured | No. of patients* | Percentage |
|----------------------------------|------------------|------------|
| Liver | 28 | 70 |
| Spleen | 14 | 35 |
| Kidney | 4 | 10 |
| Small bowel | 8 | 20 |
| Stomach | 2 | 5 |
| Colon | 4 | 10 |
| Pancreas and duodenum | 2 | 5 |
| Others (e.g. bladder, diaphragm) | 8 | 20 |

* Multiple responses obtained

It was observed that liver was the most common organ injured in blunt abdominal trauma. The incidence of liver trauma was 70% followed by spleen injury (35%). The incidence of small bowel injury was 20% whereas kidney and colon injury was 10% each.

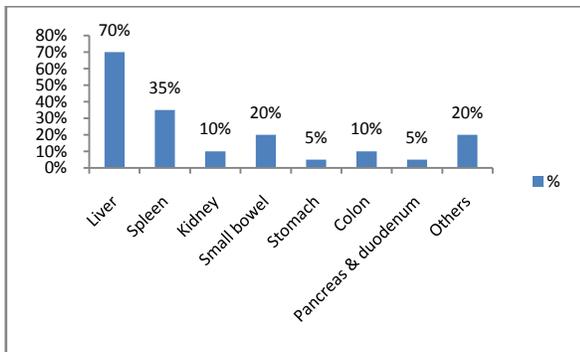


Figure 1: Incidence of organ injury in blunt abdominal trauma

Table 3: Distribution according to mode of management

| Mode of management | No. of patients | Percentage |
|--------------------|-----------------|------------|
| Conservative | 30 | 75 |
| Laprotomy | 10 | 25 |
| Total | 40 | 100 |

It was observed that 75% patients were managed successively by conservative management. Explorative laprotomy was required in 25% patients.

DISCUSSION

In present study, total 40 cases of blunt abdominal trauma undergoing diagnostic laparoscopy were studied. It was observed that the maximum incidence of blunt trauma to abdomen was in the age group of 20-30 years 45%, followed by age group 31-40 years and 41-50 years 30% and 15% respectively. The higher incidence in young age group is mainly because of economic status, high mobility and increased in utilization of vehicles by this

young age groups and exposure to bad environment and alcohol abuse etc particularly in India. Similar findings were also observed by Timothy-C Fabian *et al*⁹ and YB Chol *et al*¹⁰ in their series. The incidence of blunt trauma to abdomen was observed more in males with ratio of Male: Female as 4:1. This is due to involvement of male in travelling, drug abuse and earnings. Similar findings were also observed by Timothy-C Fabian *et al*⁹ and YB Chol *et al*¹⁰ The most common mechanism of Blunt abdominal trauma was road traffic accidents (60%) followed by assault (20%), fall from heights (15%) and others (5%). The reason for this is increased transportation and mobilization of people from mainly through the vehicles which make them susceptible to road traffic accident. Jason Smith *et al*¹¹ also observed road traffic accidents as most common mechanism of Blunt abdominal trauma. On diagnostic laparoscopy it was observed that liver injury was most commonly seen injury in blunt abdominal trauma cases. Similar findings were also observed by Town Send and colleagues¹². In contrary Michael Lenience *et al*¹³ observed spleen was commonly involved. Clinical abdominal examination is inaccurate for the assessment of the blunt trauma abdomen patients since there are often confusing injuries, altered levels of consciousness, non-specific signs and symptoms, and large differences in individual patient reactions to intra-abdominal injury. In the present series, 40 cases were included out of which 30 were conserved laparoscopically while 10 needed conversion to exploratory laparotomy. The percentage of conversion to exploration was comparable with Pascal Fabian *et al*¹⁴ and Sarmiento *et al*¹⁵ series.

CONCLUSION

Thus we conclude that the highest incidence of blunt abdominal trauma was seen in males in 2nd and 3rd decade of life and was most commonly due to RTA. The liver, spleen and small bowel were the most commonly injured organs. By using diagnostic laparoscopy majority of the patients were managed efficiently by conservative management.

REFERENCES

1. Shuck JM, Lowe RJ. Intestinal disruption due to blunt abdominal trauma. *Am J Surg* 1978 Dec; 136(6):668-673.
2. Munns J, Richardson M, Hewett P.A review of intestinal injury from blunt abdominal trauma. *Aust N Z J Surg* 1995 Dec; 65(12):857-860.
3. Salomone JA, Salomone JP. Abdominal Trauma, Blunt. Available at e medicine at Web MD, Accessed on 2nd Oct 2014.
4. Zheng YX, Chen L, Tao SF, Song P, Xu SM. Diagnosis and management of colonic injuries following blunt trauma. *World J Gastroenterol* 2007 Jan; 13(4):633-636.

5. Fraga GP, Silva FH, Almeida NA, Curi JC, Mantovani M. Blunt abdominal trauma with small bowel injury: are isolated lesions riskier than associated lesions? *Acta Cir Bras* 2008 Mar-Apr; 23(2):192-197.
6. Fakhry SM, Watts DD, Luchette FA; EAST Multi-Institutional Hollow Viscus Injury Research Group. Current diagnostic approaches lack sensitivity in the diagnosis of perforated blunt small bowel injury: analysis from 275,557 trauma admissions from the EAST multi-institutional HVI trial. *J Trauma* 2003 Feb; 54(2):295-306.
7. Nagy KK, Roberts RR, Joseph KT, Smith RF, An GC, Bokhari F, et al. Experience with over 2500 diagnostic peritoneal lavages. *Injury* 2000 Sep; 31(7):479-482.
8. Shanmuganatahn K, Mirvis SE, Chiu WC, KL, Hogan GJF and Scalea Tm (2004): Penetrating torso trauma: triple-contrast helical CT in peritoneal violation and organ injury – a prospective study in 200 patients. *Radiology*; 231; 775-84.
9. Timothy C, Fabian, et al: A prospective analysis of laparoscopy in trauma. *Annals of surgery* 217(5):557-65.
10. Chol YB and Lim KS (2003): Therapeutic laparoscopy for abdominal trauma. *Surg Endosc* ; 17:421-7.
11. Jason Smith, et al. Laparoscopy in pediatric Blunt Trauma Abdomen. A case report, *surg.l endosc* 2002; 16:358-63.
12. Townsend MC, Flancbaum L, Choban PS, Cloutier CT. Diagnostic laparoscopy as an adjunct to selective conservative management of solid organ injuries after blunt abdominal trauma. *J Trauma* 1993;35:647-51
13. Meyer Richard A, crass Robert C, lim Jr R, Brooke Jeffrey Michael P, Federle Donald D, trunkey. New concepts in abdominal trauma. *Arch surg* 1985; 120(5): 550-54.
14. Pascal Fabiani, et al j. of lap endosc and adv surge tech oct 2002;13(5): 309-12
15. Sarmiento, et al. feasibility of laparoscopy in stable blunt trauma *j Trauma* 2003; 57:887-89.

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