PATTERN OF HOLLOW VISCUS INJURY IN BLUNT INJURY ABDOMEN - A RETROSPECTIVE STUDY IN A TERTIARY CARE CENTRE

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ABSTRACT

BACKGROUND

The objective of this study is to determine the presentation, anatomical distribution, diagnostic method, management and outcome of Hollow Viscus Injury (HVI) from blunt abdominal trauma.

MATERIALS AND METHODS

This was a retrospective cross-sectional study including patients with blunt abdominal trauma leading to Hollow viscus injury admitted at Government Vellore Medical College over a period of 2 years (January 2014 to January 2016).

- Data were retrieved from patient's medical records. Total 50 patients with Hollow viscus injury due to blunt abdominal trauma, who underwent laparotomy at our Institute were reviewed.
- Data regarding clinical presentation, anatomical distribution, management and outcome were recorded and analysed.

RESULTS

- The most common site of injury was ileum (19) followed by jejunum (13).
- There were 5 gastric perforations, 4 duodenal, 4 colonic, 4 sigmoidal and 1 rectal injuries.
- Road traffic accident was the most common mechanism of injury (57.2%) followed by fall from height (36.4%) and assault (6.4%).
- Free gas under diaphragm on erect abdomen radiography was seen in 85.5% of cases, while preoperative CT abdomen was done in 11.6% of cases.
- Treatment consisted of simple closure of the perforation (66.5%), resection and anastomosis (11.0%) and stoma (22.5%).
- Average hospital stay was 13 ± 6 days.

CONCLUSION

Fifty patients were enrolled into the study. Among them there were about thirty (60%) male patients and twenty (40%) female patients. The age range between 20 to 49 years were about 66% accounting to maximum population of blunt injury abdomen reported. Twelve patients (24%) were in the age group below 20 years. Five patients were (10%) above 50 years of age injuries following blunt injuries.

KEYWORDS

Hollow Viscus Injury (HVI); Blunt Abdominal Trauma; Diagnostic Modality; Complication; Mortality.

HOW TO CITE THIS ARTICLE: Rajavelu R, Khan AMI. Pattern of hollow viscus injury in blunt injury abdomen - a retrospective study in a tertiary care centre. J. Evolution Med. Dent. Sci. 2017;6(15):1164-1166, DOI: 10.14260/Jemds/2017/253

BACKGROUND

Small bowel injuries are more often seen in Blunt Injury Abdomen. Out of most commonly proposed mechanisms of small bowel injury some of them are.

- It could be caused due to compression forces acting over the small bowel causing its entrapment between blunt external source in front and the rigid spine behind.
- When there is increased intraluminal pressure in the bowel, it causes disruption of bowel wall integrity.
- Sudden deceleration forces, which can cause tears at the junction of fixed part and mobile segments of small bowel.

- Manifestation of such injuries could be in the form of Laceration, Transection, Serosal Tears, Rupture and Subserosal haematoma.
- The fixed points of small bowel include - Duodeno-Jejunal Flexure, Ileocecal valve and Peritoneal attachments.

MATERIALS AND METHODS

The study was performed during a 2-year period from January 2014 to January 2016 in Government Vellore Medical College, Vellore. As this was a retrospective study, no informed or written consent was required for inclusion in the study. We included all the patients who were referred to our centre with blunt abdominal trauma who were diagnosed to have hollow viscus injury.

We included those Patients whose Medical Charts had Complete Data on -

- Baseline characteristics,
- Clinical findings, and
- Radiological workups.

Financial or Other, Competing Interest: None.

Submission 14-01-2017, Peer Review 07-02-2017,

Acceptance 13-02-2017, Published 20-02-2017.

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DOI: 10.14260/Jemds/2017/253

Data were collected on -

Age, sex, mechanism of injury, presentation, location of injury, associated injuries, treatment, mortality and morbidity. HVI diagnosis, operations and discharge/death was also recorded. Data was prospectively entered into a computer database.

RESULTS

Fifty patients were enrolled into the study. Among them there were about thirty (60%) male patients and twenty (40%) female patients. The age range between 20 to 49 years were about 66% accounting to maximum population of blunt injury abdomen reported. Twelve patients (24%) were in the age group below 20 years. Five patients were (10%) above 50 years of age.

Free gas under diaphragm in erect abdominal radiography was recorded in 33 patients, while preoperative abdominal CT scan/Ultrasonography was performed in 16 patients.

Exploratory laparotomy was performed in 38 patients based on clinical or radiological findings.

Ileum was the most common site of injury recorded in 19 patients followed by jejunum in 13 patients. There were 5 gastric perforations, 4 duodenal, 4 colonic, 4 sigmoidal and 1 rectal injuries.

The frequency of hollow viscus injury in our series is summarised in Figure 1.

Treatment consisted of simple closure of the perforation, resection and anastomosis and stoma. All gastric and duodenal injuries were treated by primary closure. Most of the small intestinal perforations were treated by primary closure, resection and anastomosis, while few required ileostomy. While two colonic injuries required diversion ileostomy, two rectosigmoidal injuries were treated by diversion colostomy followed by stoma closure at 3 months. Overall, 3 patients passed away due to HVI.

Associated injuries were present in 37 (21.38%) patients. Intra-abdominal injuries were mainly to the liver. Extra-abdominal injuries were mainly to the skeletal system. The mean hospital stay was 13.2 ± 6.4 (ranging from 7 to 30) days.

Hollow Viscus	Frequency
Ileum	19
Jejunum	13
Gastric	5
Duodenum	4
Colonic	4
Sigmoid	4
Rectum	1

Table 1. Frequency of Hollow Viscus Injury in 50 Patients with Blunt Abdominal Trauma referred to our Centre

Mechanism of Injury	Percentage
RTA	57.2
Fall from Height	36.4
Assault	6.4

Table 2. Mechanism of Injury in Hollow Viscus Injury

Treatment	Percentage
Primary Closure of the Perforation	66.5
Resection and Anastomosis	11.0
Stoma	22.5

Table 3. Treatment Offered in Hollow Viscus Injury

DISCUSSION

Hollow viscus injury are more often seen in Blunt Injury Abdomen.¹ Out of most commonly proposed mechanisms of small bowel injury, only three is proven.

- It could be caused due to compression forces acting over the small bowel causing its entrapment between blunt external source in front and the rigid spine behind.²
- When there is increased intraluminal pressure in the bowel, it causes disruption of bowel wall integrity.
- Sudden deceleration forces, which can cause tears at the junction of fixed part and mobile segments of small bowel.³

Manifestation of such Injuries could be in the form of -

- Laceration.
- Transection.
- Serosal tears.
- Rupture.
- Subserosal haematoma.⁴

The Fixed Points of Small Bowel include -

- Duodeno-Jejunal flexure.
- Ileocecal valve.
- Peritoneal attachments.⁵

Apart from intra-operative findings, an important external finding leading to diagnosis of small bowel injury will be Seat-Belt Mark.⁶

Seat belt syndrome⁷ is caused by sudden deceleration forces acting between posterior abdominal wall and vertebra causing injury to the organs in between due to one or other mechanisms described above.

Investigation of these cases includes

- X-ray abdomen erect to rule out gas under diaphragm.
- USG abdomen to detect free fluid abdomen.
- FAST.⁸
- DPL.

In such seat-belt injuries, there is also risk of lumbar vertebra fracture known as Chance fracture.⁹

CONCLUSION

Fifty patients were enrolled into the study. Among them there were about thirty (60%) male patients and twenty (40%) female patients. The age range between 20 to 49 years were about 66% accounting to maximum population of blunt injury abdomen reported. Twelve patients (24%) were in the age group below 20 years. Five patients were (10%) above 50 years of age. Injuries following Blunt Injuries.

Most cases of hollow viscus injury due to blunt abdominal trauma, presence of signs of peritonitis with obliteration of liver dullness supported by plain x-ray abdomen in erect posture are diagnostic and exploration is mandatory. Time scale of surgical intervention is an important prognostic factor. It is interesting to note that most of the haemodynamically stable patients of solid viscera injury are managed conservatively, while rarely in hollow viscus injury. Followup of a suspected case of hollow viscus injury is more clinical than imaging based even in haemodynamically stable patients.

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