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# A Clinical Study of Hollow Viscus Injuries in Abdominal Trauma

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**Abstract**

**Background:** Blunt abdominal trauma results in injury to the bowel and mesenteries in 3—5% of cases. The injuries are polymorphic including hematoma, seromuscular tear, perforation, and ischemia. They preferentially involve the small bowel and may result in bleeding and/or peritonitis. The main diagnostic challenge is to promptly and correctly identify injuries that require surgical repair.

**Objectives:** To study the incidence, management and outcome of Hollow Viscus Injuries in Abdominal Trauma

**Methods:** A comprehensive history was obtained from 50 patients attendants, including the patient's demographic characteristics, the type of injury (whether blunt or penetrating), the symptoms with which the patient presented, and the time elapsed from injury to admission. All patients underwent baseline tests such as haemoglobin, platelet count, blood urea, blood glucose levels, serum electrolytes, and blood grouping. Ultrasound and CT scans of the abdomen were not performed on all patients. Patients whose x-rays or clinical examinations were inconclusive had USG and CT scans.

**Results:** Male predominance was observed with 72% and females were 28%. The male: female ratio was 2.57:1.Out of the 50 cases with these kinds of injuries 56% of the cases underwent primary closure of perforation. 20% cases had resection and anastomosis. 14% of the cases had Omental patch closure of perforation and 10% cases with serosal tear underwent simple repair

**Conclusion:** Many predictors of morbidity and mortality have been identified, and treatment delays have been identified as a strong indication of morbidity that has a substantial impact on the post-operative path.

**Keywords:** Hollow viscus injury, trauma, blunt, Omental patch

## Introduction

In today's modern mobile world, trauma is the significant cause of morbidity and mortality. After head and chest injuries, abdominal organ injuries are the third most prevalent type of injury.[1] In hospital emergency rooms, both blunt and penetrating injuries are prevalent.[2]

Solid viscera are the most typically injured organs in trauma, and numerous studies have been undertaken upon them. Hollow viscus injuries, on the other hand, are just as prevalent as solid visceral injuries and are just as serious, resulting in higher blood loss and contaminated bowel injury.[3]

Intestinal and mesenteric injuries are less prevalent in acute abdominal trauma than solid organ injuries (liver, spleen), but they frequently pose diagnostic challenges that might cause therapeutic delays.[4]

Hollow viscus injuries occur when the oesophagus is injured from the cervical section to the anus, the liver and biliary tract, and the lower genitourinary tract. A serosal tear to a full transection of the gut or tracts are instances of injury patterns.[5]

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Despite modern tools and technologies such as ultrasound, CT scan, MRI scan, and endoscopy, the nature of the injury, a clear clinical history, a comprehensive clinical examination, and basic radiographs can aid in identifying many patients with hollow visceral injuries with decent accuracy. Any delay in diagnosis will increase morbidity and mortality in the long-term.[6]

As a result, a general surgeon should be able to clinically detect and treat trauma, particularly those involving abdominal hollow visceral injuries, which are becoming increasingly common. In this study, efforts were undertaken to study about the prevalence of abdominal trauma, the numerous intra-abdominal organs injured in penetrating and blunt abdominal injuries, and their varied outcomes.

## Materials and Methods

**Study Design:** Hospital-based cross-sectional study

**Study Setting:** Department of General Surgery, Gandhi Medical College and hospital

**Duration of study:** July 2021 to December 2021

**Sample size:** 50 Patients with Hollow abdominal viscus injury

**Inclusion Criteria:**

- All patients hospitalised with abdominal pain, either blunt or penetrating, who have hollow viscus injuries (contusion, serosal tear or perforation) on clinical or radiographic examination or intraoperative findings.

**Exclusion Criteria:**

- Patients with abdominal pain owing to trauma who did not have radiological or intraoperative indications of hollow viscus injuries were excluded from the study.

A comprehensive history was obtained from 50 patients attendants, including the patient's demographic characteristics, the type of injury (whether blunt or penetrating), the symptoms with which the patient presented, and the time elapsed from injury to admission. All patients underwent baseline tests such as haemoglobin, platelet count, blood urea, blood glucose levels, serum electrolytes, and blood grouping. Ultrasound and CT scans of the abdomen were not performed on all patients. Patients whose x-rays or clinical examinations were inconclusive had USG and CT scans.

**Statistical Analysis:** The SPSS 22 software was used for statistical analysis and the data was presented in the form of means and percentages.

## Observation and Results

**Table 1: Distribution based on Gender**

| Gender | No. Of patients | Percentage (%) |
|---|---|---|
| Male | 36 | 72% |
| Female | 14 | 28% |

Male predominance was observed with 72% and females were 28%. The male: female ratio was 2.57:1.

**Table 2: Distribution based on age group**

| Age group (yrs) | No. Of patients | Percentage (%) |
|---|---|---|
| ≤20 | 11 | 22% |
| 21-30 | 17 | 34% |
| 31-40 | 13 | 26% |
| 41-50 | 4 | 8% |
| >50 | 4 | 8% |
| Total | 50 | 100% |

The majority of the patients belonged to the age group of 21 – 30 years with 34%, followed by 31 to 40 yrs age group with 26%, <20yrs age group had incidence of 22%, the least no. of patients belonged to the age group of 41 – 50 yrs and >50 years of age group with 8% each.

Road traffic accidents was the most prevalent caused of hollow abdominal viscus injury in 60% of the cases, followed by fall from height in 24% of the cases, Train accidents and stab injuries accounted for 8% of the cases each. The significant injury associated in trauma was Polytrauma with 26% followed by orthopedic injuries constituting 24%, Head injuries in 15% and the least being the thoracic injuries seen in 8% of the patients.

**Table 3: Distribution based on time taken for surgery after hollow viscus injury**

| Hours | No. of patients | Percentage (%) |
|---|---|---|
| 0-12 | 33 | 66% |
| 12-24 | 15 | 30% |
| 24-48 | 1 | 2% |
| >48 | 1 | 2% |

The majority of the patients around 66% were operated within 12 hours of the injury. Around 30% were operated with 24 hrs of the injury. Around 2% of

the cases each were operated between 24 to 48 hrs and more than 48hrs after the injury due to conservative management as the risk was more complicated.

**Table 4: Distribution based on type of management**

| Hours | No. of patients | Percentage (%) |
|---|---|---|
| Primary closure of perforation | 28 | 56% |
| Omental patch closure of perforation | 7 | 14% |
| Repair of serosal tear | 5 | 10% |
| Resection and anastomosis | 10 | 20% |

Commonest repair methods performed for gastrointestinal injuries include primary closure of perforation, omental patch closure of perforation, serosal tear repair and resection and anastomosis. Out of the 50 cases with these kinds of injuries 56% of the cases underwent primary closure of perforation. 20% cases had resection and anastomosis. 14% of the cases had Omental patch closure of perforation and 10% cases with serosal tear underwent simple repair

**Table 5: Distribution based on mortality of patients based on reporting to the hospital after injury**

| Mortality | No. of patients | Percentage |
|---|---|---|
| Presentation <24 hrs | 3 | 6% |
| Presentation >24 hrs | 6 | 12% |

The mortality rate for patients admitted more than 24 hours after the injury was significantly greater than those admitted within 24 hours of the trauma.

## Discussion

Primary repair, or resection and anastomosis without a diversion colostomy, is preferable for individuals with colonic or intraperitoneal rectal injuries.[7] In individuals with extraperitoneal rectal injuries, proximal diversion colostomy alone may be adequate. Because of the increased risk of anastomotic leak, patients with stomach rupture should have a gastrectomy and an intra-abdominal drain placed at the location of the esophagojejunal anastomosis rather than no drainage. Drains are not recommended for other gastrointestinal injuries after repair.[8] The abdominal wall may need to be temporarily closed after an exploratory laparotomy for trauma so that a second look surgery may be performed later.[9]

Competent clinical judgement, rapid decisions, good and appropriate surgical procedures, and adequate postoperative care are all required for the successful management of traumatic hollow viscus injuries. Regardless of how far technology has progressed, a trained surgeon's competence is by far the most important aspect in managing a hollow viscus injury.[10]

In brief, abdominal trauma is a significant category of severe injuries that a surgeon encounters in the emergency room. The clinical appearance of these injuries varies widely depending on the site and severity of the injury, and also differentiates between blunt and penetrating injuries. It might range from a seemingly normal look after a blunt injury to a collapsed and lifeless state after hypotensive shock. Other solid organ damage may complicate matters at times. When dealing with hollow viscus injuries that are coupled with other severe injuries, the management modality should prioritise life-threatening injuries first, followed by other injuries.

Even though most studies suggest that penetrating abdominal trauma increases the risk of hollow viscus injuries, this study reveals that blunt abdominal trauma causes the majority of hollow viscus injuries, highlighting the need of effective trauma care.[11]

In all cases of blunt abdominal trauma, a hollow viscus injury should be assumed. For accurate diagnosis and to avoid delays in appropriate surgical intervention, multiple clinical examinations with thorough monitoring and repeat imaging are required in uncertain patients. The mode of repair is determined by the condition of the patient, degree of contamination with intestinal contents, concomitant injuries, and overall condition. Above all, it is dependent on the surgeon's clinical expertise as well as the trauma centre's facilities.

## Conclusion

Although early diagnosis of gastrointestinal injuries from blunt abdominal trauma might be difficult in some circumstances, it is critical because of the potential for life-threatening complications. The patient's age, anatomical location, and time of manifestation are probably the most important prognostic markers. Many predictors of morbidity and mortality have been identified, and treatment delays have been identified as a strong indication of morbidity that has a substantial impact on the post-operative path.

**Ethical Clearance:** The Ethical clearance was obtained from the institutional ethics committee of Gandhi Medical College and hospital prior to the commencement of the study.

**Conflict of interest:** Nil

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