



HOLLOW VISCUS INJURY IN BLUNT ABDOMINAL TRAUMA-A CROSS-SECTIONAL STUDY IN A TERTIARY CARE CENTRE.

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ABSTRACT Abdomen is the third most frequently injured organ in patients with civilian trauma. Most of these cases present with blunt abdominal injuries. Missed diagnosis in the setting of other associated injuries results in avoidable mortality and morbidity. Hollow viscus associated with blunt trauma poses a diagnostic challenge which may result in delays in detection and timely operative intervention. We undertook this study to describe the pattern of hollow viscus injuries following blunt trauma in our institution. We conducted this cross-sectional study at the department of surgery government medical college Kozhikode after ethics committee clearance. All consecutive patients were studied in details. Exclusion criteria were age less than 13 years, penetrating and stab injuries and hollow viscus injuries other than that caused by blunt trauma. Demographic variables, clinical examination findings, type of management, investigation findings and operative details were collected in pretested case report form, which was later abstracted into a database. All statistical analyses were done in R statistical software. During the study period, there were 746 blunt trauma patients. Of these, there were only 23 hollow viscus injuries. Males were more frequently involved. More than 90 percent of the patients presented with abdominal pain. More than 20 percent of patients presented with abdominal distention and 13 percent with chest pain. Abdominal tenderness was present in 96 percent of patients and guarding in 70 percent of patients. In our study, the most common mechanism of injury was the result of high-energy transfer as in road traffic accidents. One of the unexpected findings in our study was the high proportion of ram horn injuries. Abdominal pain was the most common presentation followed by abdominal distention. Radiological and sociological examination was the main investigative modality in diagnosing hollow visceral injury. However negative radiological and sociological examination does not rule out hollow viscus injury.

KEYWORDS : Trauma, abdominal injuries, cross-sectional study, laparotomy, perforation sectional study, laparotomy, perforation

Introduction

Trauma continues to be the most common cause of death in the age group of 15-45 age group. Among this, abdomen is the third most frequently injured requiring surgery in civilian trauma victims¹. Moreover, in 7-10% of all trauma patients, there is an associated abdominal trauma.² In addition, 75 percent of all abdominal traumas are blunt injuries³. The presence of abdominal trauma along with other injuries poses a difficulty in diagnosis⁴. As a result, it accounts for higher mortality and morbidity⁵.

Hollow viscus injury following blunt trauma is rare. Most of the hollow viscus injury occurs after penetrating trauma. Timely detection of these injuries are pertinent for timely intervention and survival of the patient⁶. There is a high probability of missing the hollow viscus injuries associated with blunt trauma⁷. This results in avoidable delays in timely operative intervention⁸. As a result, evaluation and care in these patients pose challenges and require time and resources. Mode and pattern of these injuries are of paramount importance in better resource planning and implementation of preventive activities. However, no research about the Pattern of abdominal trauma has been analyzed from our institution. We conducted this study to investigate the pattern of hollow viscus injury following blunt trauma in our institution, a referral center for the northern districts of Kerala.

Materials and methods

This study was conducted at the department of surgery medical college Calicut as a cross-sectional study from August 2010 to 31 July 2011. We took informed consents from all patients willing to take part in the study. The study was approved by the institutional ethics committee. Moreover, we conducted this study in tune with principles laid down in the declaration of Helsinki.

All consecutive patients admitted with isolated hollow viscus injury to various surgical wards of the hospital were recruited to the study. Any patients admitted following blunt injury abdomen with clinical and radiological evidence of perforation of hollow viscus organs was defined as the case. Only those patients aged more than 13 years were included in the study. Patients with penetrating and stab injuries were not considered in the study. In addition, any hollow viscus injury other than that caused by blunt trauma were not included.

All participants satisfying the inclusion and exclusion criteria were studied in detail. Variables like basic demographic variables, history,

clinical examination findings, investigation findings, type of management, operative details were taken from all patients using a pretested and well-structured data collection form. All patients were followed up until discharge. Patients were subjected to Plain X ray Abdomen in Erect Posture, Ultrasound Scan of the Abdomen and CT Scan of the Abdomen and were posted for Emergency Laparotomy if there was evidence of Hollow Visceral Injury.

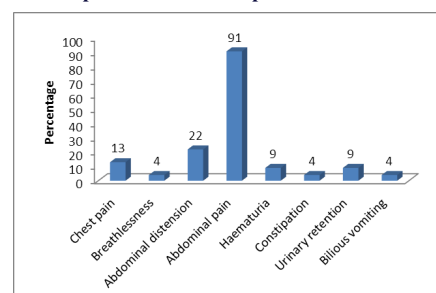
All data collected in the pretested case report form were later entered into an excel based computer database. Confidentialities of the participants were maintained in all phases of the study.

All statistical analyses were done in R statistical environment. Continuous data were summarized with mean and standard deviation, and categorical data were summarized with proportions.

Results

Out of the 746 cases of blunt trauma abdomen admitted in the government medical college Kozhikode, 23 cases had hollow viscus injury. In the present study, males were found to be the most commonly involved patients in blunt trauma abdomen with hollow viscus injury. In the present study, 91% of patients complained of Abdominal Pain. Abdominal Distention was present in 22% of patients and chest pain in 13% of patients. Hematuria and urinary retention were the presenting complaints in 9% of patients and breathlessness, bilious vomiting and constipation in 4% of the cases. Tenderness abdomen was present in 96% of the patients, guarding in 70% of the patients and rigidity and absent bowel sounds in 30% of the patients (Table 1).

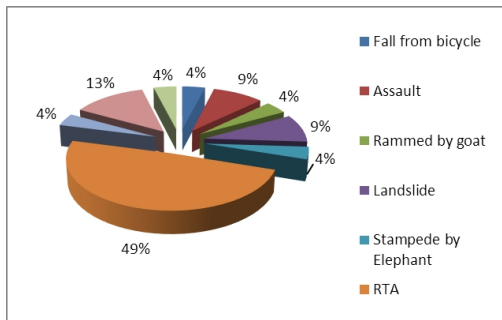
Figure 1. clinical presentation of the patients



Only ten cases showed gas under diaphragm out of 23 cases having hollow viscus injury on laparotomy (43%). Erect abdominal X-ray had only 43% sensitivity (C.I 33.2 to 53.2) and 100% specificity (95.3 to 100). Ultra sonological study picked up free fluid in 18(78%) patients and free fluid with solid particles in one case (4%).CT Scan of the Abdomen was done for all the patients. Two cases showed Small Bowel Wall Thickening (9%) and 3 cases showed mesenteric hematoma (13%).

The main etiological factor was Road Traffic Accidents (49%) followed by Log falling on Abdomen (13%). Assault and Landslide accounted for 9% of cases whereas fall from Bicycle, rammed by Goat, Stampede by elephant, fall from height and fall from train accounted for 4% of cases (figure 2).

Figure: Etiological factors



The commonest site of perforation was jejunum (57%). Ileal perforation was present in 6 cases (26%) and urinary bladder perforation was present in two cases (9%). There was one case each of jejunal transection, transverse colon perforation, caecal perforation and descending colon perforation (4%)

Discussion

The purpose of the study was to describe the pattern of blunt trauma abdomen in patients admitted at Calicut medical college, Kerala. In the present study, males were more commonly involved in blunt abdominal trauma with hollow viscus injury. The most common type of trauma was found to be road traffic accident, followed by log falling on abdomen. This is in agreement with the series by Smith et al, where more than 61% were due to Road Traffic Accidents⁹. Jha et al also reported road traffic accidents as the major mechanism of injury (57.2%)¹⁰. Hence the common mechanism of injury is that involving a high-energy transfer.

In our study, abdominal pain was the common presentation of hollow viscus injury following blunt trauma abdomen. In the study conducted by Karamercan et al, 80% of the patients presented with Abdominal Pain¹¹. In the present study, rigidity was present in 30% of the patients where as in a study conducted in a group of 1400 patients by Karamercan et al, 40% had rigidity. The combination of tenderness on percussion, guarding, absent bowel sounds and rigidity are suggestive of hollow viscus injury. However, the presence of these signs in combination in presence of solid organ injuries tends to make these signs unreliable in diagnosing hollow viscus injuries. The imaging studies like erect abdominal X ray showed gas under diaphragm in only 43% of cases in our study. This finding is in consistent with other studies in the literature like Fakhry et al¹². The prevalence of this finding is as low as 6% in other studies like Davis et al¹³. Other imaging studies like ultra sonological examination and computerized tomography also fail to detect hollow viscus injury in the majority of patients. In our series, the commonest site of perforation was at jejunum (57%). In this study, men were most commonly involved. This is in consistent with other studies like Gejoe et al¹⁴.

In patients with hollow viscus injury, jejunal perforation was found to be the commonest hollow viscus injury in trauma. This is in contrast with other studies like Jha et al¹⁰ which reported Ileal perforation as the commonest site(46.2%). Another study by Williams MD et al showed colonic injury as the most common type in hollow viscus type injuries in blunt trauma¹⁵. The result from our study is in consistent

with the study by Bajia et al¹⁶. These could be due to the difference in the regional pattern and etiology of hollow viscus injury in our country.

One of the limitations in our study is in the design of the study. The differential referral pattern to a tertiary care center may hinder the actual extrapolation from the results to the general population. One of the unexpected findings in our study was relative high proportion of ram horn injuries in our center. This could be reflecting one of the possible causes of this type of injury. Moreover, this could have significance at planning the preventive measures.

This present study reviewed the pattern of blunt injury abdomen with hollow viscus injury. In about half of the cases (49%), the mode of injury was road traffic accidents. Males in the third and fourth decade are more prone to hollow viscus injury following blunt trauma abdomen. Abdominal pain was the most common presentation followed by abdominal distension. Radiological and sonological examination was the main investigative modality in diagnosing hollow visceral injury. However negative radiological and sociological examination does not rule out hollow viscus injury.

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