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General Surgery

KEY WORDS: Isolated Mesenteric Injury, Hemoperitoneum, Ileal Gangrene.

AN ISOLATED MESENTERIC INJURY DUE TO BLUNT TRAUMA ABDOMEN CAUSING GANGRENE OF SMALL BOWEL

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ABSTRACT

Hollow viscous injury and mesenteric vascular injury after a blunt trauma abdomen although may be third most common injury , occurs only in 3 to 5 % of patients making it a rare entity. Significant mesentric injury includes disruption of mesenteric, active mesenteric bleeding, and mesenteric injury leading to gangrenous bowel.A 56 year old male was brought to the emergency room with history of road traffic accident with no external injuries. On presentation his vitals were stable , examination of abdomen revealed tense abdomen with guarding and rigidity. Given the hemodynamic stability of the patient CT scan of abdomen was done which revealed intraperitoneal free fluid , normal solid organs, abnormal bowel wall enhancement with extraluminal air pockets. Patient underwent emergency laparotomy to find out a massive hemoperitoneum with long segment gangrenous illeal bowel loop. Gangrenous bowel segment was resected and double barrel ileostomy was fashioned. The mechanism of injury involved is either direct compression forces or shearing and deceleration forces in Blunt trauma abdomen. Undiagnosed mesenteric injuries are associated with high morbidity and mortality rates due to life-threatening haemorrhage from disruption of mesenteric vessels, bowel infarction and peritonitis . This can be avoided by using imaging investigations af earliest and emergency surgical intervention.

INTRODUCTION:

Hollow viscous injury and mesentric injury ensuing a blunt trauma abdomen although may be the third most common following liver and splenic injury, this injury occurs in only 3_5% of patients making it a rare entity.These injuries usually occurs as a result of high energy trauma like road traffic accidents in 70_90% of the cases.The three basic mechanism resulting in this injury include direct crushing force, shearing force, sudden increase intra abdominal pressure leading to burst injuries. Mesenteric injury may be isolated or accompanied by associated Hollow viscous injury. Significant mesenteric injury includes disruption of mesentry, mesenteric injury resluting in ischemic bowel, active mesenteric bleeding. A prompt acknowledgement of the injury is of utmost importance because of the significant mortality and morbidity associated with these injuries.The symptoms after such injuries can be trivial hindering an early and accurate diagnosis and management. Clinical assessment alone and focussing on temporary relief of symptoms after these injuries is associated with unacceptable diagnostic delays. We reporon t a case of blunt trauma abdomen following a road traffic accident causing mesentric injury with subsequent bowel gangrene.

Case Presentation:

A 56 year old male patient with no previous medical history was brought to the emergency department with history of road traffic accident the day before and has sustained injuries to abdomen. He was in a two wheeler, then gave history of skid and fall from two wheeler. The patient went to a nearby general practitioner who treated him with an analgesic for complaints of abdominal pain and sent him home. The next day due to increase in abdominal pain, the patient went to a local hospital and was referred to our hospital He was received at our institute 20 hours after the alleged accident. The patient was concuios, oriented and GCS was 15/15. On physical examination, pulse rate was 110/minute and blood pressure was 110/70 mm of Hg. He was tachypnoeic. Airway was patent with an oxygen saturation of 99% through an oxygen mask. On primary survey, ascultated normal breath sounds which showed no clinical lung injury and heart sounds were normal and periphery pulsese were intact. There was no associated external injury on the abdomen. On secondary survey, the abdomen was soft with mild diffuse tenderness. Bowel sounds were absent. Focused Abdominal Sonography for Trauma (FAST) showed gross free fluid in the peritoneal cavity with dilated bowel loops suspicious of haemo peritoneum. Chest, cervical spine, dorsal spines and pelvis xray appeared to be normal. Given the hemodynamic stability of the patient, head to pelvis CT scanning was done which reavealed no injury to chest , and solid organs in the abdomen , free fluid in abdomen and pelvis with dilated bowel loop and an extra luminal air pocket within the peritoneum. In view of the above clinical and radiological features, patients was taken up for emergency laparotomy.

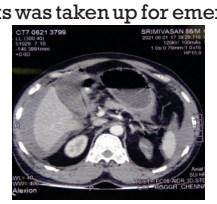

Figure 1 Ct Image Showing Extraluminal Air Pocket

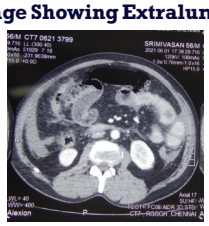

Figure 2 Ct Image Showing Dilated Bowel Loop

In the emergency laparotomy, Abdomen was entered through midline incision. At laparotomy, around 2 litres of altered blood with clots was found inside peritoneal cavity. There was a large single transverse small bowel mesenteric tear about 150 cm from the duodeno jejunal flexure, with no active bleeding. There was a gangrenous bowel segment of length 80 cm . Bowel perforation or other intra-abdominal visceral injury was absent. Resection of the infarcted segment with construction of double barrel ileostomy done as the patient went into hypotension and started on inotropic support

intraoperatively. Two intraperitoneal drains kept. The patient was then shifted to ICU, two units of packed red blood cells were transfused during pre- operative and intra-operative and post-operative period. Post-operative recovery was uneventful. Drains were removed. He was discharged on the 12thpost-operative day .Histopathology showed infarcted ileum with viable tissue at the resected ends. Patient is now on follow-up and doing well.

Figure 3 Shows Gangrenous Bowel Segment With Large Mesenteric Tear

DISCUSSION:

Abdominal vascular injuries following blunt trauma are uncommon as compared to penetrating wounds of the abdomen. Isolated mesenteric injury with subsequent small infarction after Blunt Abdominal Trauma (BAT) in road traffic accidents has a further rarer incidence (1).

Undiagnosed mesenteric injuries are associated with high morbidity and mortality rates due to life-threatening haemorrhage from disruption of mesenteric vessels, bowel infarction and peritonitis .2 The mechanism of injury involved is either direct compression forces or shearing and deceleration forces in BAT.3

Injury to the intra-abdominal structures can be classified into 2 primary mechanisms of injury – compression forces and deceleration forces.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.(3)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. Clinical manifestations of patients with isolated mesenteric vascular injury include features of intra-abdominal bleeding and peritoneal irritation. The delayed and late manifestations might be due to sepsis, bowel infarction and bowel stenosis or adhesion formation. Abdominal pain, tenderness, distension, hypotension and shock are non-specific clinical findings in mesenteric blunt trauma injuries. Sometimes retroperitoneal haematoma ensues with minimal abdominal signs and the injury may remain unrevealed until hypovolemic shock sets in (3). Seat belt sign refers to a mark on the abdominal wall along the strap site which varies from mild bruising or haematoma formation to even fat and muscular disruption.The absence of this sign does not exclude intra-abdominal vascular or visceral injury as illustrated in our case. Furthermore, in patients with concomitant head and spinal cord trauma and in those with a decreased level of consciousness, physical assessment for intraabdominal injury might not be reliable.(5)

The appearance of signs and symptoms in mesenteric injuries might be delayed. Patient may remain asymptomatic with subtle and non-specific clinical signs during initial evaluation [3]. Thus, sole dependence on clinical parameters while evaluating patients with BAT can lead to unacceptable diagnostic delays. Moreover, surgical intervention based entirely on physical examination has a high negative laparotomy rate of 40%(3) . Major trauma patients are still often dealt initially by non-specialist doctors with limited experience in this field; our case too first encountered a general practitioner. Availability of tertiary trauma care facilities and diagnostic procedures are imperative to the management of accident victims CT is both highly sensitive and specific for the diagnosis of mesenteric injury. Multidetector CT can determine the source of haemorrhage by detecting arterial contrast extravasation and may assist in determination of operative intervention .Free peritoneal fluid, infiltration of mesenteric fat, mesenteric haematoma, vascular beading and abrupt termination of mesenteric vessels are the features that can be marked in CT .(6) A careful search for these findings is crucial for early detection of mesenteric injuries. But when the CT findings are non-specific, the decision for surgical intervention largely depends upon clinical assessment. Diagnostic laparoscopy is an emerging option for evaluating haemodynamically stable patients.

The management of blunt abdominal trauma has evolved over time. While laparotomy is the standard of care in hemodynamically unstable patients, stable patients are usually treated . If the mesenteric laceration is minimal and only a localised haematoma is present, the patient can be managed conservatively.(10) However, the finding of a moderate to large volume of intraperitoneal fluid without solid organ injury should prompt surgical assessment for bowel and mesenteric injury.

The laparoscopic approach allows us to identify a bleeding or the presence of visceral lesions combining the minimally invasive treatment of the possible injury and reduces the incidence of negative laparotomies .(12) In hemodynamically stable patients who don't suffer from intracranial injuries, high grade chest trauma, preexisting intraabdominal adhesions as well as pregnancy, the laparoscopic approach can be diagnostic and therapeutic.

CONCLUSION:

The diagnosis of an isolated traumatic injury to mesentry can be delayed leading to significant morbidity and mortality. This can be avoided by the combination of high clinical suspicion and proper imaging inference , thus resulting in accurate management at the earliest averting the possibility of bowel gangrene, sepsis and even death. Early detection and emergency surgical intervention when necessary might reduce poor outcome in mesenteric injuries.

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