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A CASE REPORT OF MESENTERIC TEAR IN CASE OF SEAT BELT INJURY

General Surgery

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ABSTRACT

Introduction: Seat belt injuries are not uncommon. The use of seat belt is associated with a unique injury profile collectively termed "the seat belt syndrome". The aim is to aid in the early diagnosis of seat belt injuries. **Case presentation:** A 26 year old male patient presented to casualty after met with an road traffic accident he was the driver ,wearing seat belt and had front impact. On presentation he was concious , vitally stable , breathing spontaneously and abrasions on chest and abdomen. On CECT abdomen, proximal jejunal perforation with horizontal mesenteric tear. **Discussion:** Early diagnosis provides better outcomes for patients with seat belt injuries, but this remains a challenge to trauma surgeons. The typical findings of peritonitis might not be present initially. The presence of abdominal wall ecchymosis (seat belt sign) increases the chance of intra-abdominal injuries by eight folds. **Conclusion:** Clinical signs of intestinal injuries might not be obvious on presentation. In the presence of seat belt sign the possibility of bowel injury must be suspected. Admit the patient for observation even if no clinical or radiological findings are present at presentation.

KEYWORDS

Seat belt syndrome, Seat belt injuries, Blunt hollow viscus injury, Mesenteric injury

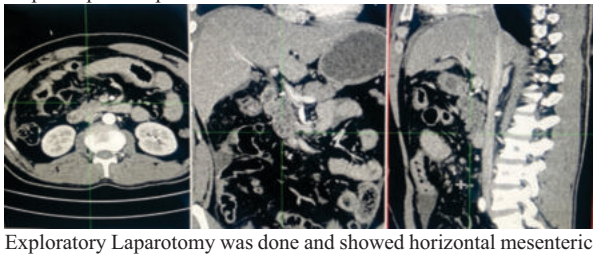
INTRODUCTION

The use of seat belt has increased significantly in the last two decades, leading to a decrease in mortality from road traffic accidents (RTA). While a seat belt of good design and properly worn will prevent the occupants of a car being flung violently against the steering wheel, dashboard, or wind- screen, the force applied to the body by the restraining effect of the belt is considerable and increase the chance of intra-abdominal injuries [1]. The use of seat belts is associated with a unique injury profile collectively termed "the seat belt syndrome". Skin abrasions of the neck, chest and abdomen – i.e., the classic seat belt sign – indicate a high chance of an internal injury.

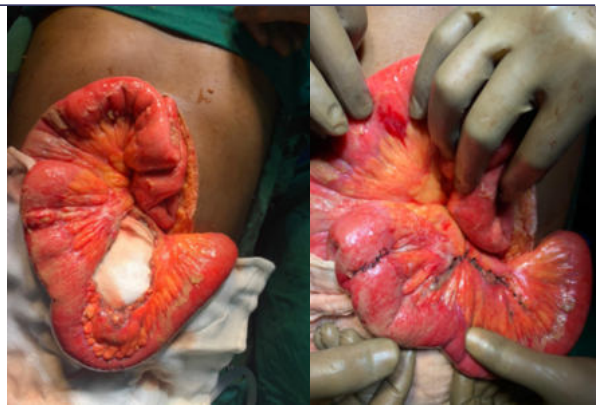
Although it is now generally accepted that injuries due to the seat belt can happen, few articles have been published on this subject and focused on the delayed presentation. We believe that this article will help in the early diagnosis of seat belt injuries. We present case of intra-abdominal injuries due to seat belt with no clear signs of intra-abdominal injuries on presentation. This article has been reported in line with the CARE criteria [2].

CASE

A 26 year old male patient with no previous surgical or medical history presented to casualty after a road traffic accident. He was the driver wearing seat belt and had front impact. On presentation he was conscious , vitally stable , breathing spontaneously and abrasions on chest and abdomen with two episodes of vomiting ,gastric content and severe abdominal pain. Abdominal examination showed seat belt sign and generalized tenderness. On CECT abdomen, there was suspicious area of defect in anterior wall of small bowel possibly proximal jejunal loop with pneumoperitoneum and mild free fluid collection.



Exploratory Laparotomy was done and showed horizontal mesenteric tear with intact bowel vascularity and proximal jejunal perforation present .



For which primary repair of jejunal perforation and mesenteric tear repair done. The post operative course in regard to enteric feeding and mobilization was unremarkable. Drains were removed on a timely manner as planned. The wound underwent proper primary healing and sutures removed on time.

DISCUSSION

In literature, the seat belt syndrome is associated mostly with the 2 points restriction "the lap belt". In both of the previously presented cases, patients were using the 3 points restriction.

Bruising of the anterior abdominal wall is suggested to be due to the belt acting as a fulcrum on the soft muscles of the abdominal wall. It may sometimes result in a complete cut of these muscles. Injury to abdominal viscera has been attributed to compression between the belt and the vertebral column [3], and the intestinal ischemia is primarily due to mesenteric tears [4].

Mesenteric tears usually occur due to the shearing force applied on the mesentery, which happens while the movable intestines continue moving with the same speed of the car, although the car is decelerated by the act of the brakes (described in physics as the inertia) [5]. These tears can be so trivial that a frank intestinal ischemia would not be apparent immediately.

Early diagnosis provides better outcomes for patients with seat belt injuries, but this remains a challenge to trauma surgeons. The

abdominal pain in the polytraumatized patients with seat belt syndrome may be dominated by the pain caused by extra-abdominal injuries. Another reason for the delayed diagnosis is that the abdominal pain and tenderness can be attributed to the bruising or injury of the abdominal wall muscles rather than thinking of a serious intra-abdominal injury. The confounding factors such as drug or alcohol intoxication can reduce the reliability of physical examinations. CT scan alone cannot be used to predict the early need of a surgical intervention [6].

A few numbers of cases with delayed presentation of the intra-abdominal injury have been documented in literature. Michael and Rehan [7] reported a case that was without clinical and radiological signs of intraabdominal injuries on presentation and on day three post-injury, developed signs of an acute abdomen and underwent emergency laparotomy which revealed a mesenteric vessel injury and ischemic segment of jejunum. Jones et al. [8] reported that all intra-abdominal injuries following blunt abdominal trauma become clinically apparent within 9 h, and all patients requiring an intervention manifest symptoms or signs within 60 min of arrival.

Abdominal wall ecchymosis (AWE) is associated with abdominal injury in up to 65% of cases (compared to 8% in the absence of AWE) [9]. The typical findings of peritonitis might not be present initially. Repeated examinations of the abdomen are essential since the possibility exists that the peritoneal symptoms can be hidden, especially with children [10]. In suspected cases, repeated CT scans are recommended after 8 h. This can help in the early diagnosis of intestinal injuries [11].

Proximal jejunum near the ligament of Treiz and distal ileum near the ileocecal junction are the most vulnerable portions of small bowel in blunt abdominal trauma, because these segments are more fixed than the rest of the gut and they are more prone to shear force injuries.

The classical signs of abdominal pain, rigidity and decrease or absence of peristalsis are detected in only one third of patients during initial physical examination and the laboratory abnormalities usually delay to occur. Therefore SBMI is difficult to diagnose clinically. The presence of "seat-belt sign" should arouse the suspicion for bowel or mesenteric injury and further investigation is mandatory.

Diagnostic peritoneal lavage and FAST ultrasound examination have shown low specificity in the detection of SBMI. CT is more accurate, consisting the diagnostic modality of choice for the evaluation of SBMI in haemodynamically stable patients. Another advantage of CT is the depiction of possible associated injuries, such as solid organ, abdominal wall or skeletal trauma.

Highly specific CT findings of SBMI are bowel wall discontinuity, evidence of bowel infarct, extraluminal air and/or oral contrast, but these are present in only a small percentage of cases. Intramural air, bowel wall thickening (>4 mm), abnormal bowel enhancement, intraperitoneal fluid and mesenteric features (fluid or air along the folds of the mesentery or fat stranding) are more frequently encountered in the setting of blunt SBMI, but they consist less specific signs. Highly indicative CT signs of mesenteric injury are active extravasation of intravenous contrast from mesenteric vessels, vascular beading and abrupt termination of mesenteric vessels.

Seat Belt Syndrome : Physical Signs & Related Injuries	
Location of Abrasion	**Affected structures**
Neck	Injuries to the carotid artery,larynx,cervical spine
Chest	Injuries to sternum, ribs ,clavicle, heart, thoracic aorta
Abdomen	Injuries to small and large bowel (mesenteric tear, perforation,hematoma) , vertebrae (chance fracture specially L2,L3),Abdominal aorta

CONCLUSION

Intra-abdominal injury due to seat belt presents characteristically late. The approach to patients with seat belt sign should be with higher index of suspicion of internal organ damage. Those with persistent pain or tenderness despite a negative CT are admitted for observation and repeated examination and abdominal CT.

Consent

Written consent was obtained from both patients for publication of this case report and accompanying images.

Conflict Of Interest

No conflict of interest.

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