The seatbelt sign: early recognition may be life-saving

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DESCRIPTION

A 47-year-old woman with body mass index (BMI) of 27kg/m² was involved in a high speed (60 mph) frontal car accident. She was the driver wearing seatbelts and the airbag deployed. There was a transient loss of consciousness before arrival to the emergency department. On presentation, the patient was breathing spontaneously and was haemodynamically stable: blood pressure was 125/80 mm Hg, heart rate 77 beats/min and the Glasgow Coma Scale (GCS) was 15. Physical examination of the abdomen revealed mild generalised tenderness. A linear ecchymosis (seatbelt sign) was present at the level of the left superior iliac spine extending across the right flank. Laboratory tests showed normal C reactive protein, increased creatine kinase (908 U/L) and

white cell count ($0.00001829 \times 10^9/L$). Echo-fast of the abdomen was negative. The chest film showed multiple rib fractures and a fracture of the left clavicle. Abdominal CT scan revealed extraluminal air adjacent to a thickened bowel loop, minimal free fluid collection in pelvis, smashed subcutaneous fat tissue along the seatbelt line and a small subcapsular haematoma of the upper pole of the spleen (figure 1A–D). Exploratory laparotomy revealed mesenteric and distal jejunal loop injury without peritoneal contamination (figure 2A,B). A primary suture repair was performed. The postoperative course was uneventful and the patient was discharged on day 7.

Road traffic collisions are a leading cause of death worldwide. The proper use of three-point seatbelts has significantly reduced morbidity and mortality due to motor vehicle crashes; conversely, severe and even fatal deceleration injuries can occur as a result of incorrectly used seatbelts.¹ One of the major clinical challenges after an indirect blunt abdominal trauma is the prompt identification of mesenteric and bowel injury since any delay in diagnosis and treatment is associated with increased morbidity and mortality. Abdominal wall bruise, generally described as seatbelt sign, corresponds to the site of seatbelt restraints. Two decades ago, a study on 117 consecutive individuals involved in motor vehicle crashes showed that 12% of these patients had a 'seatbelt sign' and about two-thirds of them had an underlying bowel injury.² Therefore, a high degree of suspicion combined with good clinical judgement and proper interpretation of the abdominal CT scan³ may help surgeons to promptly identify visceral damage and decide for an immediate surgical management.

Figure 1 Chest film showing left clavicle fracture (A) CT scan of the abdomen showing smashed subcutaneous tissue (B) Tiny extraluminal gas bubbles and localised mesenteric fatty infiltration adjacent to thickening of the bowel wall (C) Subcapsular haematoma of the upper pole of the spleen (D).

Figure 2 Intraoperative images showing cutaneous ecchymosis across the lower abdominal wall (seatbelt sign) and corresponding subcutaneous fat contusion (black arrow) (A) Jejunal perforation (white arrow) and mesenteric injury (black arrow) (B).

Learning points

- ▶ Early diagnosis of mesenteric and bowel injury in patients with blunt trauma following motor vehicle collision may be difficult because of confounding factors (pain from extra-abdominal injuries, alcohol intoxication, etc) that make physical examination unreliable.
- ▶ The presence of the 'seatbelt sign' should always heighten the index of suspicion.
- ▶ The decision to proceed to laparotomy should be straightforward in patients who are unstable or have equivocal findings at physical examination and/or CT scan.
- ▶ Seatbelt compliance has definitely reduced the mortality from road traffic collisions worldwide; seatbelt-related injuries may be reduced by proper usage and high-quality appliances.

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REFERENCES

- 1 Abbas AK, Hefny AF, Abu-Zidan FM. Seatbelts and road traffic collision injuries. *World J Emerg Surg* 2011;6:18.
- 2 Chandler CF, Lane JS, Waxman KS. Seatbelt sign following blunt trauma is associated with increased incidence of abdominal injury. *Am Surg* 1997;63:885–8.
- 3 Zissin R, Osadchy A, Gayer G. Abdominal CT findings in small bowel perforation. *Br J Radiol* 2009;82:162–71.

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