



CASE REPORT

Injuries Caused by Safety Belt Following a Traffic Accident

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Abstract

Wearing seat belt makes driving safer. Nevertheless, it can cause particular lesions. In this case report, we present a woman suffering the characteristic safety belt lesions on bowel, spine and aorta.

Keywords

Trauma, Safety belt injuries, Pneumoperitoneum, Posterior band disruption, Aortic dissection

Case Report

A 40-year-old woman is brought to the Emergency Room after a high-speed traffic accident. At the time of rescue, the patient was wearing a seatbelt.

On examination, she presented tachycardia, hypotension and abdominal rigidity. A CT angiography of the abdominal aorta is requested for suspected aortic rupture.

In the abdominal slices, at the same level, the following findings are observed:

- Pneumoperitoneum (Figure 1A). It is possible to identify the perforated intestine loop.
- Posterior tension band disruption of L3 (Figure 1B). It is a fracture that affects only one vertebra and consists of an anterior wedge fracture of the vertebral body that extends horizontally through posterior elements and affects both articular processes. Although CT does not allow adequate assessment of soft tissue, it seems that there is a disruption of the L2-L3 interspinous ligament. The mechanism of this fracture is flexion-disruption or shearing. It corresponds to grade B2 of the AO Spine classification.
- Endothelial lesion affecting the abdominal aorta, anterior to L3 (Figure 1C). Two intimal flaps of aortic dissection are observed. Since CT scan has been per-

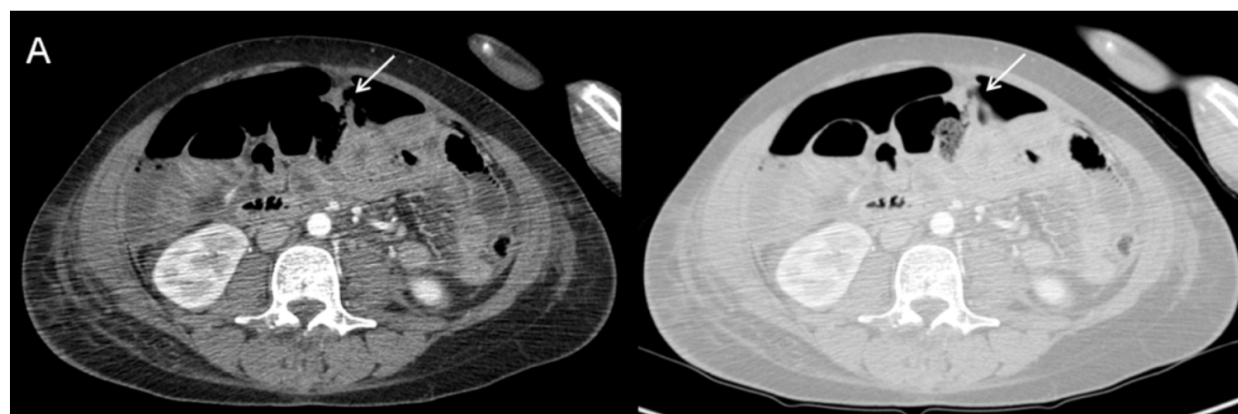


Figure 1A: Pneumoperitoneum is seen. It is possible to identify the exact point of perforation.

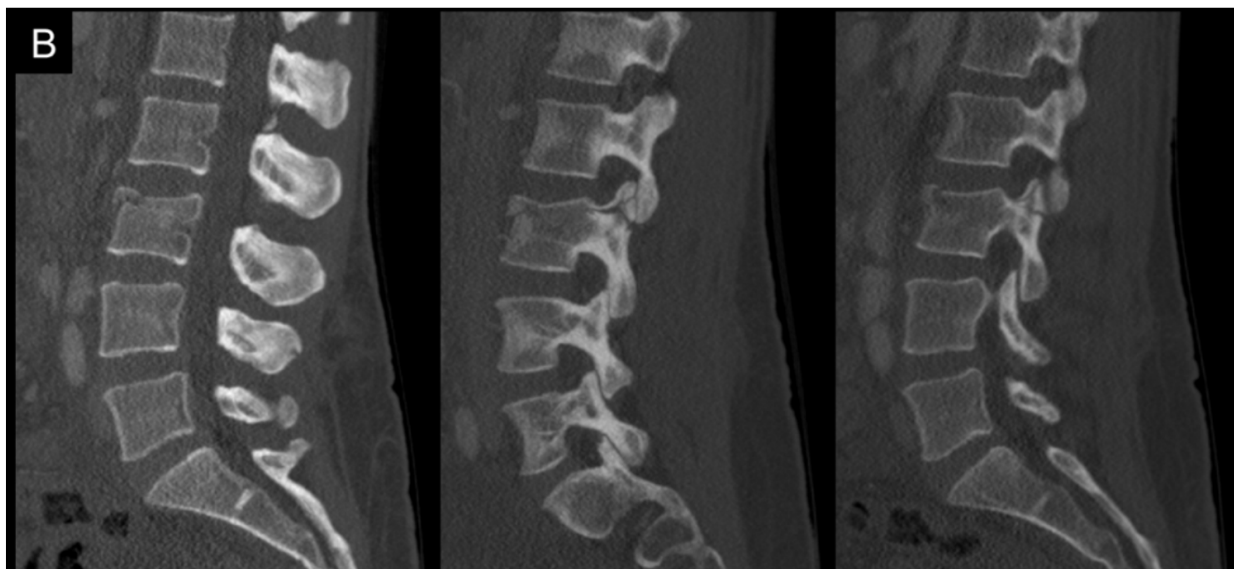


Figure 1B: Vertebral fracture affects only one vertebra and consists of an anterior wedge fracture of the vertebral body that extends horizontally through posterior elements and affects both articular processes.

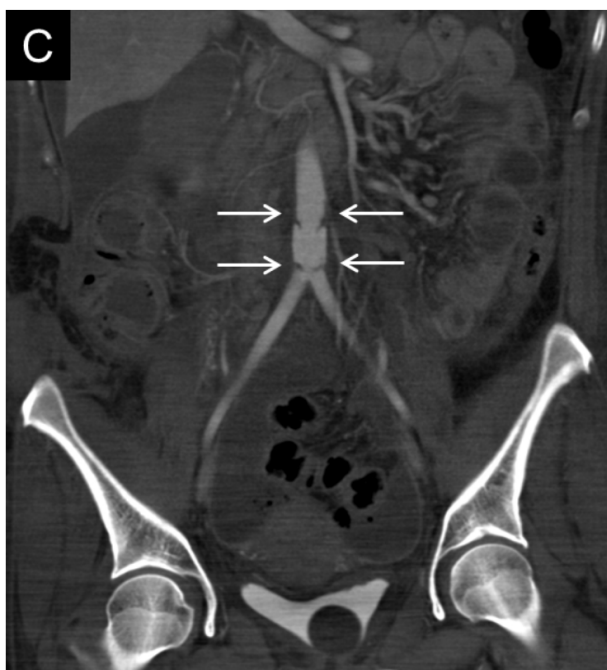


Figure 1C: Endothelial lesion affecting the abdominal aorta anterior to L3. Two intimal flaps of aortic dissection are observed, both on axial and coronal planes.

formed just a few minutes after the trauma, there is no progression of the dissection.

All the described findings are characteristic of abdominal injuries caused by shearing due to sudden deceleration in patients wearing safety belts.

Discussion

Traffic accidents are a frequent cause of pathology and have a high risk of mortality. Use of seat belt severely diminishes the severity of the injuries. A recent study reported that the use of seat belts while driving

reduces severity of injury, length of hospital stay and number of operations needed on the injured patients [1].

Deceleration produces typically some lesions when wearing a seat belt: Blunt abdominal aortic injury and lumbar spine fractures. This association was initially described in 1962 as “seat belt syndrome” [2]. A decade later, Dajee described the “seat belt aorta” as the injury to the aorta by a seat belt during a collision [3].

Injuries produced on accidents with safety belt may associate involvement of three structures, as described on different studies [4]:

- Vertebral fracture. The most characteristic of the deceleration is the Chance fracture. The fracture extends from the anterior wall of the vertebral body to the spinous process.

- Aorta. An intimal flap is formed, and this can become the beginning of an aortic dissection. It should be monitored since dissection can progress distally.

- Intestinal perforation. Less frequent, since intestinal loops have more flexibility (allowing them often to absorb the impact), but can also occur. In these cases, pneumoperitoneum is observed.

Therefore, in patients suffering a traffic accident and wearing a seat belt, it is important to look for deceleration lesions at the level of the seat belt.

Conclusion

Although the safety belt helps prevent large injuries resulting from a traffic accident, the rapid deceleration and abdominal compression can lead to other injuries.

In this case, the main lesions that can affect the intestine, the lumbar spine and the abdominal aorta

are presented simultaneously. These injuries should be sought in cases of traffic accidents in patients wearing seat belts as they can compromise life.

Disclosures

Did the author obtain written informed consent from the patient for submission of this manuscript for publication? Yes.

All the author's listed have contributed equally.

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