A rare case of blunt thoracoabdominal trauma with small bowel perforation from airbag

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INTRODUCTION

Despite the improvement of car safety devices, vehicle collisions are still the commonest cause of thoracoabdominal injuries, representing more than 75% of mechanism of blunt abdominal trauma (1-3). Besides the seatbelt, the airbag is considered as the most important invention regarding car safety.

The airbag is an established car safety device that was invented by Hetrick and Linder in the 1950s but only began to be produced 25 years ago. In spite of the incomparable triumph of this car safety device, recent studies pointed out that the airbag itself might cause injuries. In fact, several studies lead to contrasting results of the significance of passenger airbag systems to reduce both injuries severity and mortality on car accidents. The benefits of this device in decreasing trauma severity and mortality seem to be restricted to the simultaneous application of seatbelts and airbags. Physio-
cians must be aware that airbags alone do not provide adequate protection and that, although they are meant to serve as protection for drivers and passengers, they can also be dangerous for the occupants of the vehicle. Airbags alone provide only 13% reduction of the risk. The combination of airbag and seatbelts offer an estimated 50% reduction in fatality risk (4). However, depending to the impact force during the accident and also on the driver's position to the airbag an isolated airbag deployment can even produce severe injuries. Crash victims using airbag alone have increased injury severity, hospitalisations, thoracoabdominal procedure, and rehabilitation (5, 6).

We describe a case of thoracoabdominal trauma occurred during a head-on collision after an airbag deployment without seatbelt use.

Case report

A 31-years-old man was admitted to the Emergency Department after vehicle collision, during which the automobile’s airbag was deployed. At that time the patient was not wearing a seatbelt. On arrival in the hospital he was alert and hemodynamically stable, complaining of diffuse abdominal pain.

At physical examination patient’s abdomen was mild tender with light guarding, and painful to touch specially in the upper right quadrant. Peristalsism was present. Laboratory tests pointed out leukocytosis (WBC 11.6 U/L 87% of neutrophil), total bilirubin 2.43 mg/dL, amylase 243 U/L, myoglobin 1231 ng/ml, creatin kinase 298 U/L. A Computed Tomographic (CT) scan performed without contrast showed the presence of a sternal body fracture with overlap of bone fragments associated to costochondral disjunction of the sixth right rib. The CT also showed a small amount of free fluid in the peri splenic area and in the pelvis. This was confirmed on a ultrasound scan.

With the suspicious of a stable spleen lesion the patient was transferred to the General Surgery ward for careful observation and measurement of diffuse abdominal pain.

On admission, diagnosis of small bowel injuries due to blunt trauma is difficult to establish, causing a delay in definitive treatment of the patient. In fact, no diagnostic procedure, including physical examination, is completely reliable in formulating the diagnosis. Delay in diagnosis occurs in nearly 3 to 5% of cases and contributes to increase morbidity and mortality (1-3, 14).

Diagnosis of small bowel perforation is suspected in case of acute pain associated with peritoneal signs. Pain is the most constant symptom, sometimes associated with vomiting or the absence of peristalsism. Abdominal bruises are founded in 70% of patients and abdominal tenderness is elicited in 75% (1). Moreover clinical reco-
gnition can be difficult, specially when the abdominal trauma is associated with other injuries and altered mental status from a head injury, or drug/alcohol use. Laboratory tests are non-specific and contribute little to the diagnosis. On admission, less than half of patients have a white blood cell count more than 10,000 (15). Some abnormal serum amylase can be noted even without pancreatic injury (1). Increasing of myoglobin and creatin kinase after a blunt trauma is common in these patients. Presence of free air is seen in 40% of patients with small bowel trauma (1). CT performed in emergency is often specific, showing intraperitoneal fluid without solid organ injury, bowel wall thickening, streaking of the mesentery, bowel discontinuity, bowel dilated loops, extraluminal gas or small pneumoperitoneum. Ultrasounds can also be used for detection of free intraperitoneal fluid, however this diagnostic procedure is less specific in identifying possible intestinal injuries (1, 3, 16). For these reasons CT scan seems to be the procedure of choice for assessing hemodinamically stable patients. Some authors claim that laparoscopy is an important diagnostic and therapeutic tool in these patients. We consider laparoscopy a reasonable approach to abdominal trauma with a suspect of small bowel injury, only in patients with an unclear diagnosis.

In conclusion, small bowel injuries are difficult to diagnose because specific signs are poor. Delay in treatment increases mortality and morbidity of these patients so, an early and acute diagnosis is fundamental to offer to them the best prognosis. However, the best treatment in these cases remain driving prevention based on the application of National Highway Traffic Safety Administration (17), including the simultaneous use of seatbelt and airbag.

References