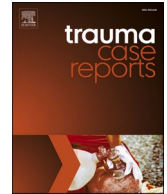




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Case Report

Lessons learned about the management of a traffic road accident victim with abdominal seatbelt sign: Case report

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SUMMARY

The abdominal seatbelt sign is well described in the literature as an indicative of intra-abdominal visceral injuries; it is considered rare because it is difficult to detect with no single observation providing reliable diagnosis. Consequently, it often presages a delayed diagnosis. We here report lessons from management of 44 year-old man professional driver, victim of a road traffic accident who underwent a damage control laparotomy and whose abdominal seatbelt sign was diagnosed late. To our knowledge, abdominal seatbelt sign has never been reported in a context of rural hospital with low technical facilities. The assessment of the injury revealed haemoperitoneum, rupture of the rectus abdominis, rupture of the appendix and the bowel loop with mesenteric tears. The patient had a second surgery due to a postoperative complication – a postoperative peritonitis with a parietal abscess; this resulted in a digestive fistula which was treated with twice-daily dressing. We learned from the management of this case that presence of an abdominal seatbelt sign in patient with good parameters should lead to paraclinical exploration. So, when faced with the presence of severe abdominal trauma, clinicians should always remember the principles of damage control laparotomy, regardless of the constraints encountered.

Introduction

The abdominal seatbelt sign (ASS) although rare is well described in the literature. Its presence usually presages intra-abdominal visceral injuries [1–3]. Delayed diagnosis of abdominal visceral injury may be observed in patients with ASS [1,4]. To our knowledge, abdominal seatbelt sign has not yet been report in a rural context with low technical facilities. Improvement in surgical practice could be achieved through self-criticism and experience sharing. With this in mind, we report here lessons we learned after management of a road traffic accident victim who underwent a damage control laparotomy and whose ASS was of late diagnosis.

Patient information

A 44 year-old man professional driver with a BMI of 24 kg/m², victim of a traffic road accident was admitted in emergency in our health centre. Principal complaints were painful hypogastrium, severe spinal pain in the lumbar region.

The patient has no pathology history, lives alone, works in a rural area.

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Clinical findings

On admission the parameters were good, blood pressure: 110/80 mm Hg; heart rate: 98 beats/min; saturation: 98 %. The hypogastrium was painful without any defence. After 6 h of clinical monitoring, the patient presented a state of shock with signs of peritoneal irritation.

Timeline

The patient was admitted to our hospital after a road accident in a vehicle of which he was the driver. After 6 h of monitoring, he presented with haemorrhagic shock and signs of peritoneal irritation. He was operated on urgently; it was in the immediate post-operative period that the abdominal sign of the seat belt (Fig. 1) came to our attention. Postoperative peritonitis was diagnosed on the 5th postoperative day. He underwent a second operation after which he developed a digestive fistula on postoperative day 6.

Diagnostic assessment

Our hospital, located in a rural area, has low technical facilities and does not have a trained sonographer available on an emergency basis. X-ray of the lumbar spine was normal. Haemoglobin level was 6 g/dl, human immunodeficiency virus test was positive. The lesion assessment was not predictable due to the absence of para-clinical explorations. Only signs of peritoneal irritation and haemorrhagic shock guided the decision to perform an emergency laparotomy.

Therapeutic intervention

The first procedure after 6 h monitoring, was for haemoperitoneum with haemorrhagic shock: an emergency median laparotomy allowed the evacuation of 1800 CC of blackish blood, the lower third of the rectus abdominis muscles were ruptured (Fig. 2), the last ileal loop about 30 cm from the ileo-caecal valve was completely ruptured on his anti mesenteric edge grade IV according to American Association for Surgery of trauma (Fig. 3), the mesentery was shredded (Fig. 3) and haemorrhagic, the appendix was ruptured (Fig. 3) and the parietal peritoneum was damaged in the right iliac region (Fig. 2); the liver and spleen were intact. The loop was preserved with a haemostatic suture of the mesentery and an end-to-end anastomosis after the edges were restored (Fig. 2), followed by appendectomy, cleaning of the peritoneal cavity, drainage and suture of the rectus muscles. The parietal closure was done with total stitches. The second procedure was performed on 5th post operative day for postoperative peritonitis and parietal abscess: laparotomy revealed necrosis of the initially preserved loop. Resection and end-to-end anastomosis were performed, as well as flattening of the parietal abscess, cleaning of the peritoneal cavity and drainage. The parietal closure was done with total stitches. On 6th postoperative day, a fistula occurred and was discharged at the right flank through the orifice of one of the abdominal drains removed on the fifth postoperative day. The patient received: a total of 9 blood transfusions, parenteral nutrition prior to hyperprotidic oral alimentation, antiretroviral drugs for HIV immunosuppression, broad-spectrum antibiotic therapy secondarily adapted to the pus culture antibiogram, analgesics and twice daily dressings.

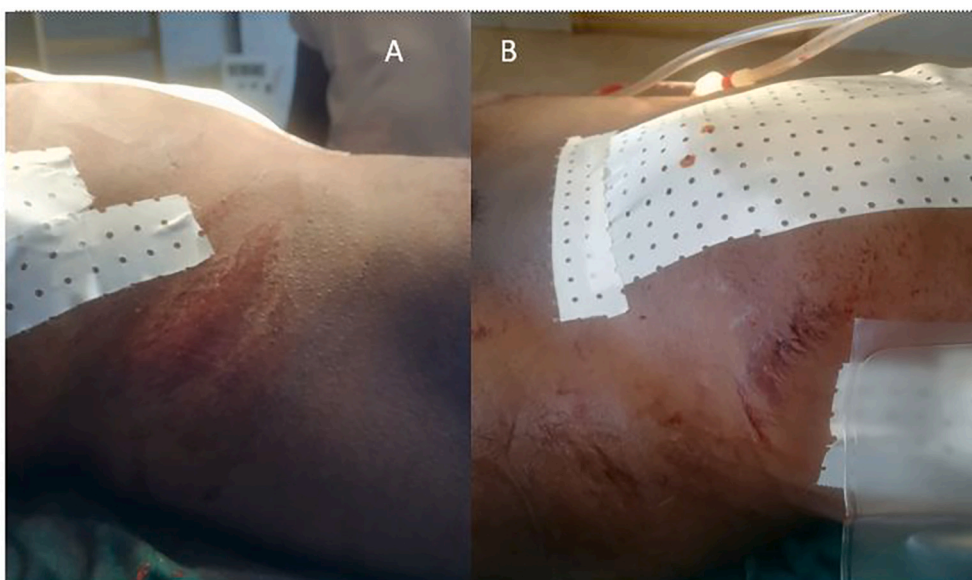


Fig. 1. A) abdominal seatbelt sign in right iliac fossa, B) abdominal seatbelt sign in left iliac fossa.

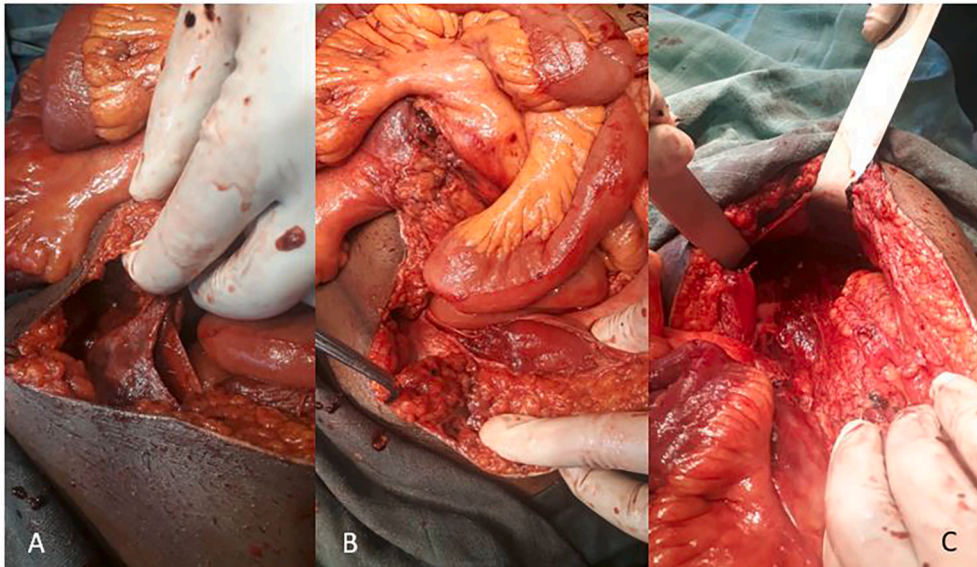


Fig. 2. A) and B) subcutaneous and rectus abdominis rupture, C) parietal peritoneum damage in right iliac region.

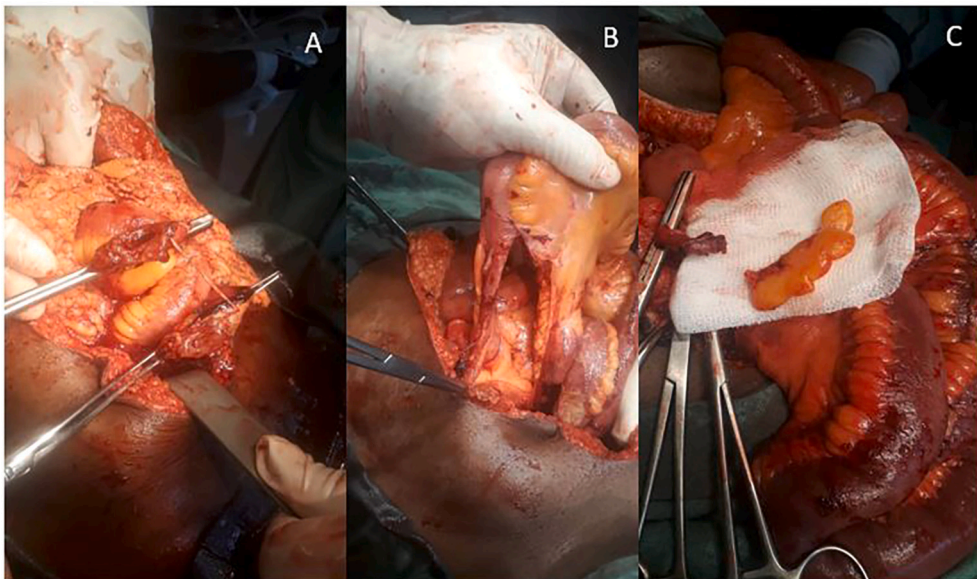


Fig. 3. A) complete rupture of loop grade IV according to American Association of Surgery for trauma, B) mesenteric breach, C) ruptured appendix.

Follow-up and outcomes

Evolution was favourable with closure of the fistula. Prognosis was good 4 months later with a return to normal eating and walking.

Discussion

The seatbelt sign was unknown to the care team prior to the management of this injured vehicle driver. This sign, which is more common in vehicle drivers [5], went unnoticed, hence our decision to perform clinical monitoring. This decision resulted in a 6-hour delay to perform damage control surgery, which is one of the essential cornerstone concepts for the management of critically injured or ill patients that are too unstable [6]. A simple abdominal contusion had been evoked without paraclinical exploration. Diagnosis delay in the presence of the seatbelt sign is more associated with bowel injury, than with solid viscera injuries, as haemodynamic instability requiring immediate surgery is prevalent in solid viscera injuries [7]. Abdominal wall injuries with ASS such as muscle rupture are

rarely reported in the literature. In our case, we observed a rupture of the rectus muscles in their lower third which became secondarily infected leading to a wall abscess. Several works have shown a correlation between the abdominal sign of the seat belt and lesions of the spleen, liver, mesentery, colon, and small intestine; but few have cited the rupture of the vermiform appendix. The severe spinal pain could be a response to the mechanism whereby the abdomen, which is considered to be a balloon, has been violently compressed at the hypogastric level by the seatbelt and the force of this compression has spread to the lumbar spine [4]. For a critically injured patient, the decision to perform a damage control laparotomy is based on the risk of life-threatening coagulopathy [8]. Surgical strategy sacrifices the completeness of the operation in favour of an action guided by a physiologic approach, with a preference to rapidity and limited control of injury (stop bleeding and contamination control) [9]. Ileostomy after haemorrhage control was the best option in our case, because of vasospasm that occurs during shock state. More interestingly, in our case the loop vascularisation was compromised due to the mesenteric lesion. According to the damage control strategy, reoperation is dangerous in the immediate postoperative period, but it has to be proposed later for reexploration or damage reparation [8]. During the second procedure, the end-to-end anastomosis which was performed in a septic field, malnutrition and immunosuppression context had little chance of holding. However, we had no experience with ileostomies, which are known for their specific management. Moreover, stoma bags are difficult to access in our context. The management of the fistula that occurred during the second postoperative period was facilitated by a fistulous path that corresponded to the outlet of one of the abdominal drains removed on the fifth postoperative day. Nowadays, substantial agreement exists among experts regarding many strong recommendations for the best early management of severe abdominal trauma [10].

Conclusion

Lessons learned from this case are: looking for ASS is crucial when receiving a road traffic accident victim who was in a vehicle. The presence of an ASS in a patient with good parameters should lead to paraclinical exploration; in front of severe abdominal trauma, one should always remember the principles of damage control laparotomy regardless of the constraints encountered.

Patient perspective

The patient demanded not to be evacuated to a hospital with better technical facilities. He was fully satisfied with the care he received.

Informed consent

The patient's informed consent has been obtained and can be made available on request.

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