Small bowel perforation and mesentery injury after an unusual blunt abdominal trauma—Case report

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INTRODUCTION: In blunt abdominal trauma, lesions of the small bowell and mesentery are often under-diagnosed; although unusual, they represent the third most injured organ, with increasing morbidity and mortality.

PRESENTATION OF CASE: The authors present the case of a 68 years old male, admitted to the emergency department after being hit by a bale of straw, weighing around 300 kg, in the abdomen. After successful resuscitation, a CT scan was performed, suggesting hemoperitoneum because of vascular lesion of the right colon bleeding. An exploratory laparotomy was performed, confirming the presence of blood in the abdominal cavity and identifying jejunal perforation, an apparently innocent hematoma of the small bowel mesentery (beside the bowel wall) distally to the first lesion and a laceration of the sigmoid serosa; a segmental jejunal resection and suture of the colon serosa were performed. In the early post-operative period, an enteric discharge was noticed, mandating surgical reexploration; a previously unnoticed bowel perforation, in the mesenteric border where the hematoma was identified, justified an additional enterectomy, after what the patients recovery progressed uneventfully.

DISCUSSION: In this case, a sudden increase in abdominal pressure could explain that missed rupture of the mesenteric border of the jejunum, also causing the mesenteric hematoma, or, in spite of that, a state of low perfusion could have lead to total wall ischemia of an already irrigation compromised segment. Only noted after surgical exploration, despite prior evaluation with a computed tomography. Small bowell and mesenteric injuries are potentially missed due to decreased exploratory laparotomies for blunt abdominal trauma.

CONCLUSION: Although uncommon, small bowel and mesenteric injuries are associated with high morbidity and mortality. High clinical suspicion is essential for an early diagnosis.

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The exact pathophysiologic mechanism for traumatic blunt small bowel injuries is not well understood, but some mechanisms have been described [5].

A sudden increase in pressure within a closed segment of intestine would explain antimesenteric perforation as the ones seen in our patient. Shearing and tangential forces may be responsible for mesenteric injuries, as the one sustained by this patient near the ileocecal junction (a fixed point prone to this kind of lesion); in the first laparotomy no signs of ischemia or perforation were noted, despite rigorous examination of the small bowel. The decision of not performing another segmental resection was made. Once there was not signs of perforation or ischemia, such decision could raise complication rate. It is to our believe that most probably a perforation was missed or evolving ischemia developed and, a new operative procedure was necessary.

Although laparotomy indication was made as soon as an abdominal trauma with a grade III hemorrhagic shock was noted, since the patient was stable and without compromising the timing of the surgery, a CT was performed to collect more information before an intervention.

Resuscitation was initiated in the first survey with crystalloid fluids according to trauma guidelines. Despite achieving hemodynamic stability after 1 L of fluid, a pack of red blood cells was initiated and another one was performed during surgery.

Before the widespread use of abdominal CT in the evaluation of blunt abdominal trauma, exploratory laparotomies were much more common (mainly due to the high sensitivity and low specificity of diagnostic peritoneal lavage) and few abdominal injuries where missed. Nowadays, with the information provided by CT as much as 50% of patients with blunt solid organ injury are eligible for nonoperative management [3].

SBMI is associated with high morbidity and mortality, which increase with delayed diagnosis: clinical and radiographic signs of perforation are often absent, making diagnosis difficult. CT with a sensitivity and specificity of 97.7% and 98.5%, respectively, is considered the gold-standard for the detection of SBMI [6].

In our case although immediate clinical and imagiologic diagnosis and prompt immediate surgical approach, the patient developed secondary perforation and subsequent localized peritonitis. Thorough surveillance and high clinical suspicion was essential for timely reintervention.

3. Discussion

Small bowel perforation after blunt abdominal trauma is a rare condition (0.3% of blunt trauma admissions) [3]; the vast majority is caused by motor vehicle accidents, handle bar injury and falls [2]. To the best of our knowledge, this is the only reported case of SBMI after straw bale injury.

4. Conclusion

SBMI is a rare but deadly injury. The understanding of the mechanisms responsible for this kind of traumatic lesion are valuable in the first evaluation of blunt abdominal trauma.

An imaging supported clinical approach is essential for an early diagnosis, but also for a careful vigilance for related injuries and complications.

Conflict of interest

There are no conflicts of interest.

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Ethical approval

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Author contributions

João Castro – participated in surgery and care of the patient, study concept and written the article.
Gabriel Gomes – responsible surgeon, review article.
Nuno Mateus – participated in surgery, review article.
Ricardo Escrevente, Luis Sequeira, Paulo Jácome – review article.

Consent

The patient signed an informed written consent.

Guarantor

João Castro.

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