

Isolated jejunal perforation after blunt trauma. Report of three cases

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SUMMARY: Isolated jejunal perforation after blunt trauma. Report of three cases.

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Small bowel perforation occurs in 3% to 5% of cases of blunt abdominal trauma. The initial clinical exam can be unremarkable because signs of hollow viscus injury (HVI) may take time to develop. Conventional radiograms are often unable to diagnosis of this subset of trauma.

Three cases of jejunal perforation after a blunt abdominal trauma are described. One of these showed at laparotomy small siero-muscular diastasis of the jejunum and multiple ecchymosis of the small bowel without peritonitis. The detection of this subset of trauma patients has improved markedly with CT, wich has led to a decrease in the number of negative laparotomies performed.

In our report CT imaging showed a increased thickness of bowel loop wall in left ipocondrium in the first and second case. In our small experience this sign suggest us a jejunal contusion in which an isolated perforating is always possible.

RIASSUNTO: Perforazione isolata del digiuno dopo trauma chiuso dell'addome. Descrizione di tre casi.

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La perforazione isolata del digiuno ricorre, come complicazione di un trauma chiuso dell'addome, nel 5% dei casi. I tipici segni, quali aria libera nelle immagini radiografiche o peritonismo alla valutazione clinica, impiegano mediamente 12-24 ore a manifestarsi.

Presentiamo 3 casi di perforazione isolata del digiuno dopo trauma chiuso dell'addome, di cui uno soltanto diastatico.

La TC dell'addome è stata risolutiva nell'identificazione della condizione. I due segni tipici sono stati l'aria libera, anche se modesta in tutti e tre i casi, e il marcato ispessimento di alcune anse digiunali con "enhancement" positivo.

KEY WORDS: Blunt abdominal trauma - Jejunal perforation - Post-traumatic peritonitis.
Trauma chiuso dell'addome - Perforazione del digiuno - Peritonite post-traumatica.

Introduction

Small bowel perforation occurs in 3% to 5% of cases of blunt abdominal trauma. The initial clinical exam can be unremarkable because signs of hollow viscus injury (HVI) may take time to develop. Conventional imaging

is often unable to diagnosis, but the detection of this subset of trauma patients has improved markedly with CT, wich has led to a decrease in the number of negative laparotomies performed.

Three cases of jejunal perforation after a blunt abdominal trauma are here described.

Case reports

Case 1

A 62 years old man was admitted at Emergency Departement after a blunt abdominal trauma from being kicked by a horse. Abdominal pain and vomiting were the initial symptoms. Hematochemical exams and abdomen and thorax radiographs were normal. Six hours later he develop tender abdomen with Blumberg sign positive. An enema of abdomen was negative. A CT of the abdomen

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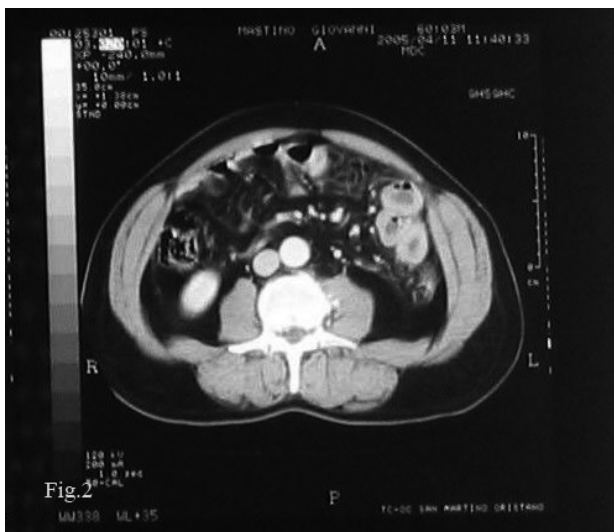


Fig. 1 - Case 1. CT scan of the abdomen shows free mesogastric air and increased wall thickness of bowel loop on the left ipocondrium.



Fig. 2 - Case 1. Intraoperative view of isolated jejunal perforation.

was performed; it revealed mesogastric free air, moderate amount of free fluid and increased thickness of bowel loop wall (Fig. 1).

The patient was taken for the operating room. At laparotomy a isolated jejunal perforation, approximately 15 cm from the ligament of Treitz, was detected (Fig. 2); a double layer enterorrhaphy was performed. There was no evidence of other abdominal injuries.

The patient was discharged five days after.

Case 2

A 32 years old woman was admitted at Emergency Departments for a thoraco-abdominal trauma by safety belt. Thorax radiographs revealed three left costal fractures, but no subdiaphragmatic free air; CT of the abdomen shows a left renal contusion without hematuria and small peritoneal free fluid. No other parenchymal lesions were noted.

A conservative management was adopted, but 36 hours later, for the increasing abdominal pain and rigid abdomen onset, the patient



Fig. 3 - Case 3. Intraoperative view of small sero-muscular diastasis of the jejunum and multiple echimosis of the small bowel.

was taken for the operating room. At laparotomy a peritonitis from isolated jejunal perforation, approximately 25 cm from the ligament of Treitz, was detected. A double layer enterorrhaphy and a peritoneal drainage were performed.

The patient was discharged ten days after.

Case 3

A 19 years old man was accepted in Emergency Department for a politrauma. Conventional radiographs and CT of head, thorax and abdomen revealed an exposed fracture of the right femur, a fracture of the left femur, a fracture of the left tibia and a fracture of the right wrist. A thin subdiaphragmatic sickle of free air was evident at CT scans but no in the radiographs.

He was taken to the operating room and the laparotomy revealed a small sero-muscular diastasis of the jejunal wall and multiple echimosis of the small bowel (Fig. 3). One layer enterorrhaphy was performed.

Patient died 12 days after for a pulmonary fat embolism.

Discussion

Small bowel perforation occurs in 3% to 5% of cases of blunt abdominal trauma (1). The classic triad of small bowel injury (rigid abdomen, tenderness, absent bowel sounds) occurs in only one-third of patients. The initial clinical exam can be unremarkable because signs of hollow viscus injury (HVI) may take time to develop. Patients who had a mechanism of injury that suggests serious lesion, yet having mild initial pain, may require hospital observation to monitor clinical evolution.

The detection of this subset of trauma patients has improved markedly with CT, which has led to a decrease in the number of negative laparotomies. In the setting of blunt abdominal trauma, CT has a sensitivity of 92%, a specificity of 94%, a positive predictive accuracy of 30% and a negative predictive accuracy of 30%.

100% for the diagnosis of small-bowel laceration/contusion (2).

Common CT signs of small bowel perforation in order of decreasing frequency include: peritoneal free fluid (80%), bowel wall thickening (60%), free air (40%), and contrast extravasation (15%). Free air and contrast extravasation are found in only half of patients with small-bowel perforation, but each are nearly 100% specific for bowel perforation. Other sign of small bowel rupture is the streaky mesentery sign. Although none sign is 100% sensitive, the presence of multiple signs carry a 90% sensitivity and 95% specificity (2-6). Continued surveillance with CT is widely accepted. When small bowel, particularly duodenal, injury is present, there is a high association of solid organ injury. These include pancreas (45%), liver (30%), spleen (25%), and kidney (10%). There is also a 15% incidence of colonic injury. The presence of these other injuries may delay diagnosis of small bowel injury; to avoid this a thorough examination of the small bowel should be performed when these injuries are present. Extraperitoneal injuries may also mask small bowel injury, particularly retroperitoneal and rectus sheath hematomas (2-6).

In our report CT imaging showed an increased thickness of bowel loop wall in left ipocondrium in the first and second cases (Fig 2). In our small experience this sign suggest a jejunal contusion in which an isolated perforation is always possible. The young patient (case 3) had not a complete perforation and he was taken to the operatory room only by the TC findings. Maybe that a conservative management is impossible for the diagnosis, delay and sometimes the peritoneal signs appear more days after trauma because a complete perforation on the diastasis may develop.

Diagnostic radiographic findings seen on plain film include free air under the diaphragm or along the abdominal wall. A skilled clinician may also find that other imaging modalities, such as ultrasound, are highly specific with moderate sensitivity in detecting intra-abdominal fluid. Negative CT scans and/or diagnostic peritoneal lavage (DPL) do not rule out bowel injury. In-

tra-abdominal injury is excluded by documenting the return of normal bowel function. This usually occurs within 24 hours in children who do not have intra-abdominal injuries. In adults, bowel function may return in 24 hours, but it can take longer (7-10).

Patients who have small volume of fluid in the pelvis with no other signs of injury can be safely managed conservatively; however, moderate to large amounts of free fluids seen on CT are a strong indication for exploratory laparotomy.

The time observation is not universally codified. Frick et al. have stated that delays up to 36 hours don't increase morbidity and mortality. Allen et al. and Robbs et al. disagree and stress that therapeutic delays of more than 24 hours are associated with increased mortality. If treatment of small bowel perforation is delayed, mortality rises dramatically from 5% to 65% (2-4).

If abdominal complaints persist after an initial CT showing no bowel injury, continued surveillance is warranted (11). Because delayed rupture is also possible, clinicians should counsel patients to return immediately for treatment if pain becomes worse (12, 13).

Conclusion

Jejunal perforation and other HVI are uncommon complications of blunt abdominal injury that can often be masked by more serious injuries, such as solid-organ ruptures or extraperitoneal injuries. Also, symptoms can be quite subtle and slow to appear. Controversy exists as to whether abdominal CT, diagnostic peritoneal lavage or physical exam alone is the best way to diagnose HVI in patients with blunt trauma.

In our experience TC enhanced free air and increased wall thickness of some bowel loops. When the injury is suspected, the results of serial exams can be used to determine the need for laparotomy to establish the diagnosis; if in doubt, continued clinical surveillance is a safe procedure.

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