

Traumatic laceration of the rectum after blunt trauma. Key sonographic and CT findings

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Section: Abdominal imaging

Area of Interest: Abdomen

Procedure: Diagnostic procedure

Imaging Technique: CT

Imaging Technique: Ultrasound

Special Focus: Trauma Case Type: Clinical Case

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Patient: 39 years, female

Clinical History:

A 39-year-old woman was admitted to the emergency department with acute and exacerbating pain in the hypogastrium following a jet ski crash. The woman also presented with rectal bleeding, with its onset just after the accident.

Imaging Findings:

FAST ultrasound examination was performed, revealing the presence of extraluminal free air alongside the posterior wall of the urinary bladder on the left and in the area between the rectum, the vagina and the uterine cervix. A characteristic sonographic finding was the presence of multiple reverberation artefacts accompanied by "dirty shadowing", which is pathognomonic for the presence of free extraluminal air. No associated solid organ contusion or subcapsular haematoma was detected. Additional sonographic findings included the presence of free fluid in the Douglas pouch with complex echogenicity. Contrast-enhanced CT revealed areas of wall discontinuity of the rectum, with the presence of extraluminal free air in the mesorectal fat, the rectouterine pouch, and the left perivesical area, most probably related to additional disruption of the mesorectal fascia. Haemorrhagic perirectal fluid collections and a small haematoma in the soft tissues of the pelvis and the perineum were also present. No solid organ contusion, laceration, hematoma (subcapsular or intraparenchymal) or bone fractures were identified. No free gas was recognised in the peritoneal cavity.

Discussion:

Rectal injuries as sequelae of blunt abdominal trauma are relatively rare. They are quite often attributed to the clinical difficulty in establishing an early diagnosis, with resulting high morbidity and mortality [1]. The rectum is the least frequently injured organ in trauma with an incidence of 0.1–0.5% [2]. Although CT is the mainstay imaging modality in the early evaluation of traumatic bowel laceration along with rigid rectoproctoscopy, early diagnosis can also be made via ultrasound. A highly specific sonographic finding is the presence of multiple reverberation artefacts identified extraluminally and accompanied by the characteristic sonographic “dirty shadow”, indicating the presence of free extraluminal air [3]. In traumatic bowel laceration, isolated retroperitoneal air is a quite uncommon finding and, typically, air is also seen in the peritoneal cavity [3]. However, if free air is identified in the lower pelvis, rectal injury should always be suspected [4]. The most specific CT findings of bowel wall injury include extraluminal presence of oral contrast medium, discrete bowel wall discontinuity, active bleeding related to mural injury and active extravasation of intravenous contrast into the bowel lumen [5]. Associated, less specific findings are segmental bowel wall thickening, bowel wall enhancement, free intraperitoneal fluid and retroperitoneal hematomas [1,5]. Bowel wall discontinuity is the definite and most specific CT finding in bowel perforation, but often it may not be visualised, as in the case of contained rupture [4,5]. Management principles for rectal injuries differ owing to the fact that the rectum comprises two different anatomic segments, the intra- and intraperitoneal rectum. The exclusion of free gas into the peritoneal cavity is crucial in order to decide the treatment strategy. Intraperitoneal rectal injuries are managed as colonic injuries, with small injuries primarily repaired and larger injuries resected. Extraperitoneal injuries are repaired primarily via trans-anal approach, if feasible, and otherwise are managed with proximal diverting colostomy alone [5]. In our case, a proximal diversion as a temporary loop colostomy was surgically conducted. The presence of retroperitoneal air should always raise suspicion for a perforated retroperitoneal viscus organ in the setting of blunt abdominal trauma and is a relatively specific sign of bowel perforation. In cases of rectal lacerations, using imaging to define which segments are involved is crucial for further surgical management [1,5]. The use of transabdominal ultrasonography has been minimally discussed in the literature and may be a promising tool in early and immediate diagnosis of rectal laceration in the context of trauma, under certain circumstances.

Differential Diagnosis List: Traumatic laceration of the rectum owing to blunt trauma, Rectal laceration due to foreign body insertion, Normal intraluminal air in the rectum, Traumatic urinary bladder rupture, Rectal fistula, Recent surgery

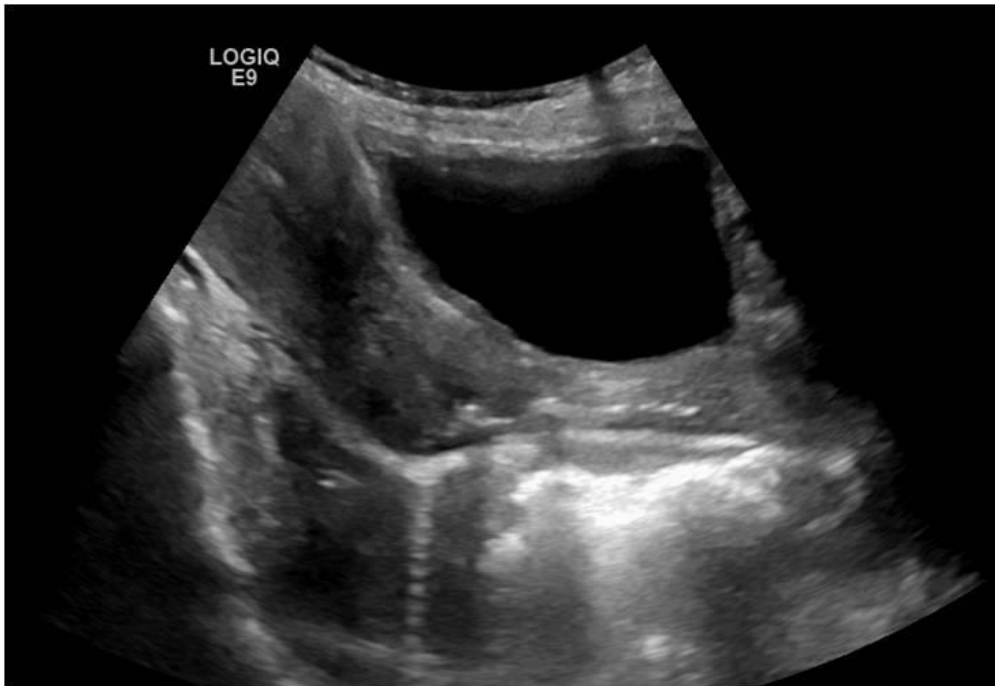
Final Diagnosis: Traumatic laceration of the rectum owing to blunt trauma

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Figure 1

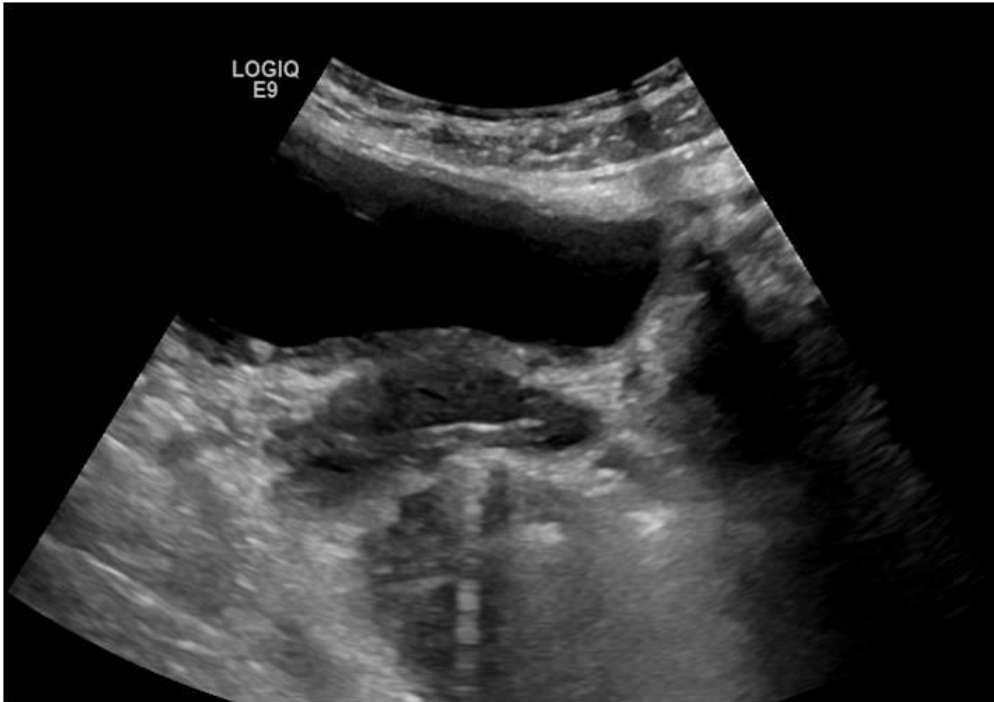
a



Description: Sagittal sonographic view depicting free extraluminal air posterior to the uterine cervix, in extraperitoneal site as multiple reverberation artefacts accompanied by the characteristic sonographic “dirty shadow”. **Origin:** © Department of Radiology, University Hospital of Ioannina, Ioannina, Greece

Figure 2

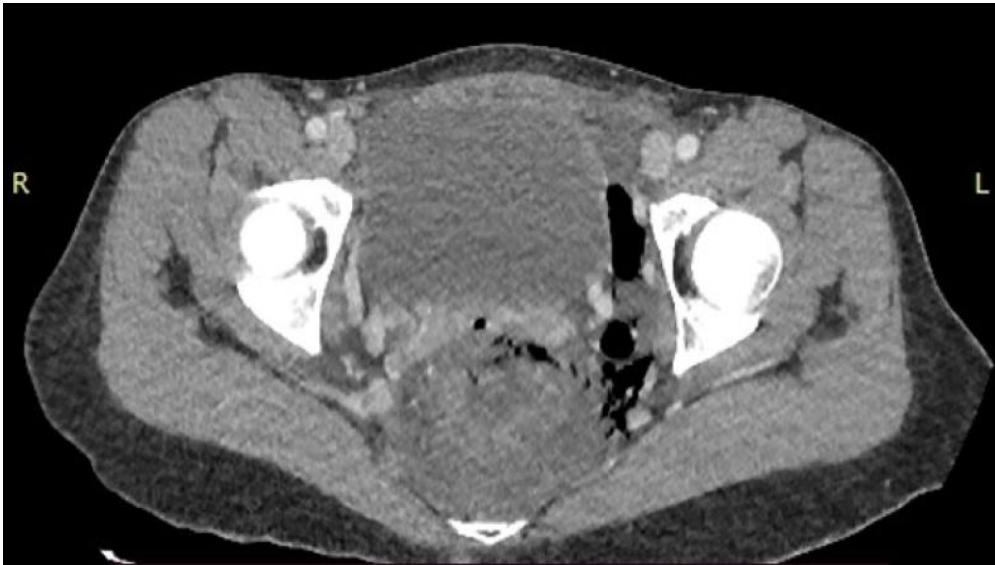
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Description: Axial sonographic view showing free extraluminal air in the area between the uterine cervix and the rectum as focal reverberation artefacts accompanied by the characteristic sonographic “dirty shadow”. **Origin:** © Department of Radiology, University Hospital of Ioannina, Ioannina, Greece

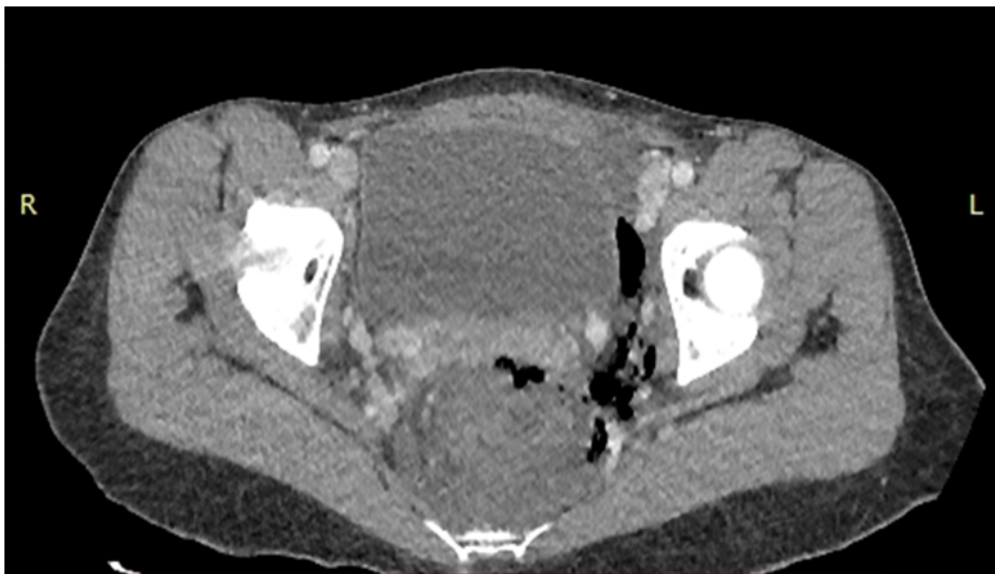
Figure 3

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Description: Axial CT images showing areas of wall discontinuity of the rectum, with presence of extraluminal free air in the mesorectal fat and the left perivesical area, in the pelvic subperitoneal tissues. **Origin:** © Department of Radiology, University Hospital of Ioannina, Ioannina, Greece

b



Description: Axial CT images showing areas of wall discontinuity of the rectum, with presence of extraluminal free air in the mesorectal fat and the left perivesical area, in the pelvic subperitoneal tissues. **Origin:** © Department of Radiology, University Hospital of Ioannina, Ioannina, Greece

Figure 4

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Description: Sagittal CT image showing the presence of extraluminal free air in the left perivesical area and posteriorly to the uterine cervix and the vagina. **Origin:** © Department of Radiology, University Hospital of Ioannina, Ioannina, Greece

Figure 5

a



Description: Coronal CT image showing rectal wall discontinuity and presence of extraluminal extraperitoneal free air in the left pararectal fat. **Origin:** © Department of Radiology, University Hospital of Ioannina, Ioannina, Greece