Sonography of complex splenorenal injury following blunt abdominal trauma: haemorrhage into the perinephric space obscuring FAST visualisation of the kidney

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DESCRIPTION
Focused assessment with sonography in trauma (FAST) is widely utilised by emergency physicians in the management of trauma. FAST techniques are classically underpinned by the recognition of free fluid. However significant additional clinical clarity can often be achieved through higher order interpretation of organ and retroperitoneal abnormalities.

We report a case where FAST demonstrates severe perinephric haemorrhage.

A 31-year-old gentleman presented in a critically injured state following a fall from a third floor height. He had multiple primary survey issues on arrival to the emergency department including a blood pressure of 62/34 mm Hg, a pulse rate of 146 bpm and a Glasgow Coma Scale of 3/15.

Multiple targeted resuscitative interventions were employed, including bedside FAST. Sonography of the left upper quadrant is shown in figures 1 and 2 and reveals a small expanding splenic capsule haematoma along with a sonographically obscure left renal area. Following stabilisation of haemodynamics, a whole body CT was performed. Figures 3 and 4 demonstrate a large perinephric haematoma with a relatively intact left kidney.

Unfortunately this patient died from diffuse brain injury some hours later.

Sonography of renal and retroperitoneal structures in trauma is acknowledged to be challenging but is nonetheless possible.1–3 The interpretation of architectural abnormalities rather than the more rudimentary binary decisions of fluid presence, reflects the evolving contemporary knowledge and skillset of the modern emergency medicine ultrasound practitioner. Failure to sonographically visualise the kidney in severe abdominal trauma should indicate massive perinephric space haemorrhage as a strong diagnostic possibility.

Figure 1
Resuscitation room ultrasound of left upper quadrant showing spleen (Sp), small splenic capsule haematoma (arrow) and perinephric haematoma (arrowheads) obscuring FAST visualisation of the left kidney.

Figure 2
Subsequent serial focused assessment with sonography in trauma examination revealed expanding splenic capsule haematoma (arrow), splenic notch (*) and perinephric haematoma (arrowheads). Note the heterogeneous echogenicity of acute haemorrhage.

Figure 3
Coronal CT with contrast showing the left kidney surrounded by massive perinephric haematoma (arrowheads) extending inferiorly. Gerota’s fascia is a connective tissue layer surrounding the perinephric fat, the kidney and adrenal gland. It encloses these structures on all sides except inferiorly. This remains an open potential space and explains the extension of the perinephric space haematoma inferiorly in this case.

To cite: O’Connor G, Doyle JE, Ramiah V, et al. BMJ Case Rep Published online: [please include Day Month Year] doi:10.1136/bcr-2013-202088

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Coronal CT with contrast showing the left kidney surrounded by massive perinephric haematoma (arrowheads) extending inferiorly. Gerota’s fascia is a connective tissue layer surrounding the perinephric fat, the kidney and adrenal gland. It encloses these structures on all sides except inferiorly. This remains an open potential space and explains the extension of the perinephric space haematoma inferiorly in this case.
Learning points

▸ Failure to visualise the kidney on focused assessment with sonography in trauma should raise the suspicion of perinephric space haemorrhage in the context of severe abdominal trauma.
▸ Perinephric space haematoma has an amorphous heterogeneous echogenic appearance on sonography.
▸ Sonography of retroperitoneal structures can be challenging in victims of trauma, but is nonetheless possible.

Acknowledgements The authors would like to sincerely acknowledge the goodwill of the relatives of the deceased. They gave permission for this image to be published in the hope that in future a similar ultrasound finding might help in the management of other victims of abdominal trauma.

Contributors GOC acquired the ultrasound images, wrote the manuscript, and acquired consent from the next of kin for publication of images. All other authors helped in writing the manuscript and provided critique and guidance.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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