Rupture of a massive hydronephrotic upper pole moiety: a sequalae of mild trauma

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DESCRIPTION

A 37-year-old man, with no medical history, presented acutely with severe left-sided abdominal pain following a fall on a pavement while jogging. There was gross abdominal distension with guarding in the left lumbar and upper abdominal regions on examination. Blood tests revealed acute kidney injury with a fall in glomerular filtration rate from 90 mL/min/1.73 m² to 44 mL/min/1.73 m². Haemoglobin level was normal.

An urgent CT urogram revealed findings consistent with rupture of a hydronephrotic upper pole of a duplexed left kidney (figures 1 and 2). The duplex kidney had duplicated ureters, giant hydronephrosis of the upper pole moiety (UPM) and megaureter, with extravasation into the retroperitoneum and peritoneal cavity and a normal left lower pole moiety (LPM) and ureter. The right kidney and collecting system were normal.

An urgent insertion of a left nephrostomy into the UPM was organised, immediately draining 600 mL of urine. A left-sided retroperitoneal drain was also inserted, which drained 50mL of a similar fluid.

Subsequent ultrasound and MRI of the abdomen and pelvis for interval purposes and tissue characterisation confirmed a marked decrease in size of the collecting system with minimal distortion and a reduction in size of the retroperitoneal collection.

A rigid cystoscopy and retrograde study were performed on day 6, to further delineate the anatomy of the duplex system. The LPM and associated ureter were inserted in its orthotopic position at the trigone however the now decompressed UPM and ureteric orifice were not visualised. The presentation, imaging and procedure all fulfilled the criteria for the Weigert-Meyer law. The Weigert-Meyer law describes how ureters in a duplicated collecting system drain. It states that with ureteral duplications, the LPM drains superolateral to the UPM, at its expected position at the trigone. The UPM, however, drains inferomedially to an ectopic location. At the time of cystoscopy, methylene blue dye injected into UPM nephrostomy was not visualised in the bladder, which, according to the law, predicts an ectopic ureter, with an inferomedial insertion and obstructing ureterocoele.

Alternatively, Stephen’s ectopic pathway postulates that Weigert-Meyer’s law may be broken. Instead of the ectopic ureter draining inferomedially to the orthotopic ureteric orifice location, rarely it may drain superomedially to it.

A follow-up CT urogram demonstrated a normal LPM however the UPM was non-functioning with a thin cortex and no contrast flow through the renal pelvis to ureter. A urology multidisciplinary team discussion recommended a dimercaptosuccinic acid (DMSA) scan to assess the differential function of the left and right kidney along with the two moieties of the left kidney to decide whether the patient can safely proceed to left upper polar heminephroureterectomy. The DMSA scan demonstrated a photopenic appearance of the upper third of the left kidney consistent with poor function. He has subsequently been referred to a tertiary centre.

This is the first report, to our knowledge, of a ruptured duplex system following abdominal trauma.
Learning points

► The Weigert-Meyer rule applies to this case study. It states that the upper moiety ureter drains inferomedially to the lower pole moiety, often to an ectopic location.
► The ureter of the upper pole moiety frequently ends as a ureterocoele, which can obstruct the collecting system leading to hydronephrosis and hydroureter. This can present with symptoms relating to mass effect.
► Rarely, mild abdominal trauma can lead to rupture of a grossly hydronephrotic duplex collecting system.

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