CASE REPORT

An unusual inguinoscrotal hernia with renal involvement

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SUMMARY

We present a case of a 74-year-old man who, while in intensive treatment unit for an upper gastrointestinal bleed, decompensated cardiac failure and concurrent pneumonia, was found to have a large right hydronephrotic pelvic kidney and bladder within the hernia. After discharge, he was medically optimised for 7 months before undergoing an elective open mesh repair of his hernia. During the procedure, drainage of a large hydrocoele was performed to facilitate reduction of the hernia. Postoperatively, he underwent ureteric stenting due to a persistent hydronephrosis with impairment of his renal function. He subsequently made a good recovery and was discharged home with outpatient follow-up planned.

BACKGROUND

Although inguinoscrotal hernias containing urological organs have been reported in the literature, to our knowledge, this is one of only two case reports describing the involvement of a kidney. It confirms the need to cautiously and fully explore the possibility of renal involvement within hernia sacs, and the importance of a multidisciplinary team (MDT) approach.

CASE PRESENTATION

In April 2014, a 74-year-old man was admitted to the intensive treatment unit (ITU), with an upper gastrointestinal bleed, decompensated cardiac failure and concurrent pneumonia.

Furthermore, he suffered a ventricular fibrillation cardiac arrest, for which an implanted cardiac defibrillator was placed. During the course of his 3-week admission, an incidental large right inguinoscrotal hernia was identified and shown to contain a markedly hydronephrotic pelvic kidney and bladder on CT scan (figures 1 and 2). A long-term urinary catheter was inserted on discharge, as the patient was unable to micturate following catheter removal.

Following hospital discharge, the patient underwent extensive follow-up in cardiology, respiratory, ENT (ear, nose and throat), urology and general surgery outpatient clinics. His chronic cardiac failure and atrial fibrillation were managed medically. He had an anatomically difficult airway due to two previous tracheostomies and a vocal cord palsy following the period of intubation on ITU. During his outpatient investigations, diagnoses of obstructive sleep apnoea and chronic obstructive pulmonary disease were reached, and treated with home

oxygen and nocturnal continuous positive airway pressure.

Thus, over a period of 7 months, these many comorbidities were optimised and the patient's renal function was normal, at which point the relevant specialists deemed the patient suitable for general anaesthesia and surgical repair of his symptomatic hernia.

INVESTIGATIONS

CT (with intravenous contrast) of the abdomen and pelvis was performed initially in the ITU, following the cardiac arrest, to exclude a leaking abdominal aortic aneurysm (no aneurysm present, but a retro-peritoneal haemorrhage was identified and treated conservatively). The scan allowed assessment of the size, contents and anatomical deficit of the inguinoscrotal swelling to be made and revealed a pelvic right kidney with hydronephrosis, obstructing at the level of the pelvi-ureteric junction (PUJ) with the proximal ureter in the hernia sac. It is not usually the investigation of choice for scrotal swellings (below).

Ultrasound scan (USS) of the abdomen and testes was performed following the patient's ITU recovery, but would have been the initial investigation of choice had exclusion of other diagnoses not been needed. USS is a useful tool to assess scrotal contents and causes of urinary retention¹⁻³ (herniation of part of the bladder into the hernia sac was thought to be responsible for this patient's failed trial without catheter). The scan confirmed a

Figure 1 Large right-sided inguinoscrotal hernia containing a dilated right ureter (red arrow) and omentum.

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Figure 2 Grossly dilated right renal pelvis (red arrow) and proximal ureter seen at the origin of the right inguinoscrotal hernia sac.

hydronephrotic pelvic right kidney with a normal size and position of the left kidney. Both testes were normal and small bilateral hydrocoeles were present.

Radioisotope renography (MAG3 scan) was performed following hernia repair, to assess differential renal function due to a persistently hydronephrotic right kidney and acute renal impairment. Renal function was split 30%:70% (right:left). Delayed drainage of a horizontally lying right kidney was also noted. This could have been a useful preoperative investigation to assess differential renal function prior to intervention.

DIFFERENTIAL DIAGNOSIS

The diagnosis became clear following the above investigations. Although the number of differential diagnoses of an inguinoscrotal swelling is large, appropriate radiological investigations (listed above) will easily reach the correct diagnosis. It is interesting to note, however, that the pelvic right kidney must have descended further following CT as it was only apparent in the inguinoscrotal sac during surgical repair.

TREATMENT

Consensus was reached using an MDT approach involving the general surgeons, urologists, cardiologists, respiratory physicians, anaesthetists and radiologists, in conjunction with the patient's and family's wishes. It was felt the hernia should undergo operative fixation due to the risk of worsening renal impairment and the symptomatic nature of the hernia.

The patient was appropriately counselled and consented for the procedure, and a postoperative high dependency bed was planned. He underwent an elective open repair of his massive right inguinoscrotal hernia through an inguinal approach, during which the hernia contents, including the pelvic kidney, right ureter and bladder, were identified and explored. The sac contents were dissected free from the cord structures and drainage of a large hydrocoele (not seen on previous imaging) was performed to facilitate reduction of the hernia (figure 3).

The patient's postoperative recovery was complicated by persistent hydronephrosis of an ectopic-positioned right kidney postreduction and acute renal impairment, which required a return to theatre by the urologists for retrograde right ureteric stenting, with subsequent improvement.

Figure 3 CT KUB postoperative: reduction of right inguinoscrotal hernia and right kidney; the latter continues to show persistent hydronephrosis.

OUTCOME AND FOLLOW-UP

The hernia remained reduced, while the patient's renal function improved. He subsequently made a good recovery and was discharged home with outpatient follow-up planned.

DISCUSSION

Inguinoscrotal herniation of the bladder or ureter is a rare but recognised variant of an inguinoscrotal hernia;⁴ up to 4% of cases involve the bladder,⁵ while 140 cases involving the ureter have been documented in the literature since 2009.⁴⁻⁶ They often co-exist with lower urinary tract symptoms, which should be sought when assessing a patient with a groin swelling. A history of haematuria, acute urinary obstruction, double phase micturition requiring pressure to initiate or finish voiding, or ipsilateral flank pain with an inguinal hernia, can indicate urological organ involvement. If left untreated, strangulation of the bladder or ureter can occur, usually warranting surgical correction with or without ureteric re-implantation.

The case presented is extremely unusual. While other authors have reported inguinoscrotal hernia cases with acute renal impairment⁷ or other renal pathology (eg, concomitant renal cell carcinoma),⁸ the hernia sac itself has contained the ureter and/or bladder.

To the best of our knowledge, our case is one of only two published case reports describing the involvement of a kidney. The other report, by Wendler *et al*,⁹ described the dislocation of a primary orthotopic kidney in a large inguinal hernia.

Our patient had a long-standing inguinoscrotal swelling, which was incidentally found during his acute medical illness. Herniation of the bladder made it difficult for the patient to micturate, requiring long-term catheterisation following his acute illness. Interestingly, he no longer needed a catheter following hernia (and thus, bladder) reduction. Significant medical comorbidities led to a necessary delay in operative management, despite radiographic evidence of right hydronephrosis in the presence of normal renal function. This appears to have been caused by partial right proximal ureteric obstruction within the inguinoscrotal hernia sac, although the presence of the kidney within the hernia (not identified until surgery) may have contributed.

Ureteroinguinal hernias are known to cause ipsilateral hydro-nephrosis, a non-functioning kidney or recurrent pyelonephritis. Two anatomical and pathological variants of this type of hernia have been described: intraperitoneal or paraperitoneal, and extraperitoneal.¹⁰ An intraperitoneal ureteroinguinal hernia is an acquired anomaly, presenting in the fourth to sixth decade of life within a true peritoneal hernia sac. The ureter is drawn into the scrotum as a result of adhesions to the posterior sac wall and accounts for 80% of ureteroinguinal hernias. The remaining 20% are extraperitoneal, congenital in nature and without a peritoneal sac, containing only the ureter, and are therefore small in size.

The causes of excessive kidney descent into the scrotal region are not fully understood. Each kidney with its fibrous capsule rests in a layer of perinephric fat, encompassed by the thick Gerota's fascia. This is then separated from the muscles of the posterior abdominal wall by another layer of fat. If the kidney had descended from the renal fossa, excessive lengthening of

the renal vessels would have resulted in a small atrophic kidney from impaired blood flow.

Preoperative imaging in this case shows both kidneys to be of equivocal size (right 135 mm; left 130 mm) with an unusually positioned right kidney. The authors therefore believe that this case is likely the result of the ectopic right pelvic kidney herniating through a large inguinal floor defect, causing it to migrate into the inguinoscrotal region.

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Contributors All authors (HTO, RB, HW, SMS) contributed to researching the case and writing the case report.

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Learning points

- Impairment in renal function in the presence of an inguinal/inguinoscrotal hernia should lead to investigations for renal involvement.
- Where renal involvement is present, this should lead to quick surgical intervention within a multidisciplinary team approach.
- Ultrasound scan is a useful, non-invasive imaging modality to assess scrotal swellings, including inguinoscrotal hernias.
- The presumed explanation of the mechanism is an ectopic right pelvic kidney with descent into the scrotum via an inguinal floor hernia defect.

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