

Inguino-scrotal herniation of the ureter containing stones

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Abstract

Background Inguino-scrotal herniation of the ureter is a rare and difficult situation for a surgeon, especially if only recognized during inguinal hernia repair.

Methods An 83-year-old gentleman, with a previous history of radiation treatment for squamous anal cancer, presented with a large left inguinoscrotal hernia causing occasional pain at the base of the scrotum. Follow-up, post-radiation therapy CT scan showed a hernia sac containing the bladder and large bowel. Calcifications in the sac were interpreted as bladder stones, in keeping with the history of left renal calculi.

Results During hernia repair careful dissection revealed a herniated portion of the left ureter located alongside a large hernia sac, complicated by ureteral calculi. Following stones extraction and ureteral repair, hernia repair with mesh was successfully accomplished. Pathogenesis of ureteric herniation is reviewed.

Conclusion A herniated ureter is potentially a source of serious renal or ureteral complications. When discovered, ureteric hernias should be surgically repaired. If preoperative detection of a ureter herniation alongside an inguinal hernia is missed, awareness of the existence of this condition may help avoid iatrogenic ureteral damage injury during a complex hernioplasty. Documentation of unexplained, sizeable and distinct calcifications in an inguino-scrotal hernia sac, particularly in a patient with a history of urolithiasis, may suggest the presence of a herniated, calculus-filled ureter. In such cases, retrograde pyelograms may be considered for a definitive diagnosis prior to surgery.

Keywords Inguino-scrotal hernia · Ureter · Stones · Urinary obstruction

Introduction

Colons and urinary bladders may sometimes be found in large sliding inguinal hernias. The presence of a previously undiagnosed, herniated ureter in the context of a complex sliding hernia repair is an uncommon and intricate situation for a surgeon. We present a case of para-peritoneal herniation of the ureter complicated by ureteric calculi incidentally diagnosed during an inguino-scrotal hernia repair.

Case report

An 83-year-old gentleman, with a background history of squamous anal cancer previously treated with radiotherapy radiation therapy, was admitted to our division for an excisional biopsy of the residual post-treatment scar in the

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Fig. 1 CT scan

anal canal. On this occasion, the patient requested simultaneous repair of a long-standing, voluminous left inguino-scrotal hernia. For several months, such hernia had been causing occasional discomfort to him, and occasionally sharp pain at the base of the scrotum, which he considered a consequence of the radiation treatment therapy (RT). A new admission was planned for hernia repair, and post-RT follow-up contrast CT scan, performed 6 months before admission for scar excision earlier, was reviewed. It showed prostatic hypertrophy, left kidney non-obstructing left renal calculi and bladder stones. There was no hydronephrosis or ureteral dilation, but a large left-sided inguino-scrotal sliding hernia was seen containing the bladder and large bowel. Calcifications seen within the hernia sac were interpreted as stones within the partial herniation of the bladder containing stones (Fig. 1). After anesthetic assessment, elective surgery was offered. A preoperative clinical examination showed the hernia which appeared to be non-reducible, but non-strangulated. All preoperative blood tests including renal function did not show significant alteration abnormalities.

The hernia repair was performed through a standard left inguinal incision. After opening the inguinal canal, the content of the hernia sac was exteriorized. The isolation of the sac proved immediately difficult and complex due to adhesions, and there was marked thickening and fibrosis of the walls of the inguinal canal, with dense adhesions embedding the elements of the spermatic cord within the inguinal canal. Once the vas deferens and spermatic vessels had been identified, isolated and encircled, another structure was identified and separated from the sac. When first seen, this structure appeared large and mimicked a pre-hernia lipoma. After dissection, the same structure looked similar to a dense cord (about 15 cm long by 3 cm wide), at the inferior extremity of which it was possible to palpate a very hard, calcified area extending for about 2 cm from the proximal end.

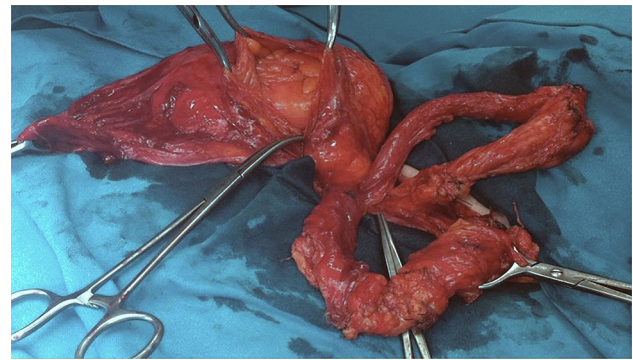


Fig. 2 Operative image



Fig. 3 Ureteric stones in hernia sac

Careful dissection unexpectedly revealed that the structure was actually the left ureter (Fig. 2). It was initially found folded on itself, so it ran like two barrels of a gun (Fig. 2) with a sharp 180° angle at the distal turning point. Multiple ureteric calculi were distinctly found at the kneeling ureteral turning point (Fig. 3). Once the dissection was complete, a separate operative field was created and five intact stones were extracted by ureterotomy. The ureter was repaired with a single layer of interrupted, absorbable slow-reabsorption interrupted sutures.

The hernia sac, containing the sigmoid colon, was reduced in the abdomen, the defect was repaired with composite lightweight mesh (UltraPro-Ethicon Surg.) and a suction drain positioned. The patient's postoperative course and healing were uncomplicated. The preoperative CT scan was reviewed again in the light of the operative findings and within-sac hyperdensity and it was determined that the calcific densities previously seen perfectly matched the ureteric stones. An earlier PET scan, not available at the time of admission prior to surgery, was also obtained from another institution where it had been performed to evaluate the efficacy of his previous RT (Fig. 4); hyperaccumulation of tracer had not been previously reported, but at the level

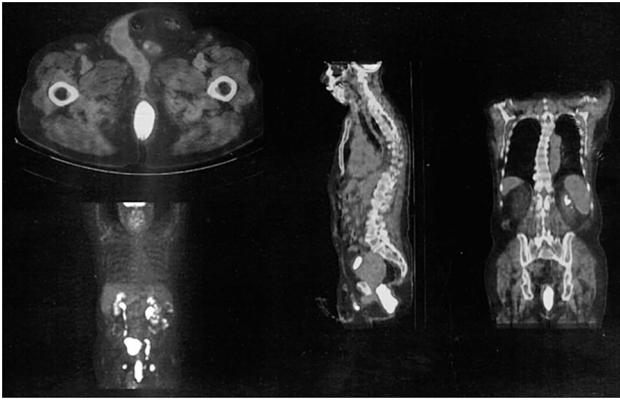


Fig. 4 PET scan herniated urether

of the left ureter. By knowing the surgical findings, it was now possible to demonstrate the left ureter, herniated and folded at the level of the groin and scrotum. On PET scan, there was no evidence of hydronephrosis, and calculi were not visible.

Discussion

Herniation of the ureter is a rare finding, with 140 cases collected from the whole world's medical literature until 2004 [1]. In less than half of these cases, the hernia involved the inguino-scrotal region [2]. Classically, two forms of presentation of ureteral herniation have been described [2–5]: the most frequent (about 80 %) is para-peritoneal herniation, characterized by an indirect peritoneal hernia sac to which the ureter adheres posteriorly and slides together. It typically presents with the sac containing other sliding organs; often the colon is usually reducible and is typically an acquired hernia. It generally occurs between the fourth and sixth decades of life and is not generally associated with other urological malformations. Para-peritoneal ureter herniation is believed to be acquired. Extraperitoneal ureteral herniations are relatively rare, not associated with peritoneal hernias, not reducible, usually relatively small and are thought to be derived from a congenital defect [6–10], where the ureter herniates without a concurrent hernia sac [7–9]. This condition is believed to result from a congenital defect of ureter formation, where the ureteric bud fails to separate from the Wolffian duct, and the ureter is drawn with the duct when it migrates down to the scrotum to form the epididymis and vas deferens. This has also been associated to explain the presence of other urological congenital malformations in about half of the reported anomalies of the urogenital tract [10]. For this reason, it has been suggested that patients with inguinal hernias and congenital, anatomical abnormalities of the upper urinary tracts should undergo

urological imaging (IVP) even if no urinary symptoms are present [2].

Our case represents the more common para-peritoneal occurrence, which is also the most difficult to identify, and where preoperative diagnosis was obtained preoperatively in <1 % of cases [11]. Unlike extraperitoneal ureteral hernias, which usually present with classical urinary symptoms that may trigger further investigations showing the herniated ureter, the frequent lack of a preoperative diagnosis makes paraperitoneal hernia the most frequently exposed to intra- and postoperative complications more likely to be discovered only during surgery and therefore far more likely to develop surgical and ureteral complications.

Our case also demonstrates that, if unsuspected, it is often difficult to diagnose such a rare anomaly, even when contrast enhanced CT scan is obtained. Abdomen and pelvis contrast-enhanced CT scan does not always accurately and reliably show the entire course of the ureters, which might instead require a dedicated urological imaging protocol such as intravenous urography or a retrograde pyelogram CT urogram [12]. Such investigations may be often used to study chronic obstructive uropathy that is sometimes absent in some para-peritoneal ureteral hernias [1–13]. When discovered, ureteric hernias should be surgically repaired. Failure to do so may result in a loss of renal function on the affected side, hydronephrosis, urosepsis, ureteric damage requiring surgical reconstruction or even the complete removal of the affected kidney.

In our patient, despite angulation of the ureter and the presence of multiple distal ureteric stones, there were no appreciable clinical symptoms, hematuria, demonstrable hydronephrosis or significant difference of caliber upstream and downstream the visible obstruction.

Clinician awareness of this rare occurrence and high degree of suspicion preoperatively and at surgery are the best means to prevent severe iatrogenic ureteral damage.

Inguinal hernias containing the ureter are nearly always indirect [2]. During an operation, there are clues that might suggest a ureteric herniation: an unusually large lipoma next to the hernia sac containing the large bowel (para-peritoneal hernia); dissection revealing a tubular structure other than the spermatic cord elements with peristaltic movements during manipulation; the intraoperative presence of abundant fat without a clear hernia sac [5], beside the cord elements of non-straightforward interpretation; peristaltic movements seen during manipulation [6]. Inguinal hernias containing the ureter are nearly always indirect [1]. Intraoperative diagnosis may be confirmed by aspiration with a syringe of a clear, high creatinine-containing fluid from the tubular structure [5].

The discomfort at the base of the scrotum that our patient had complained of was arguably of urinary origin,

being unusual in an uncomplicated hernia, but without classical urinary symptoms.

Conclusion

The presence of an undiagnosed herniated ureter at the time of hernia surgery exposes the patients to a significant risk of ureteral injury damage. Although specific diagnostic studies as CT urograms, intravenous and retrograde pyelograms can potentially identify this condition reliably, these are not part of the routine assessment during the preoperative workup of an inguinal hernia patient presenting without urinary symptom complaints, or alteration of renal function or other symptoms suggesting possible uropathy [1, 8].

When such a condition is suspected, specific imaging can be done preoperatively. When the ureteral herniation is diagnosed early, a stent can often be placed to protect and help identify the ureter during surgery.

Therefore, knowledge and awareness of this rare condition and careful dissection of all structures eventually accompanying the hernia sac or sitting alongside the elements of spermatic cord elements are still the best resources a surgeon can use to avoid iatrogenic ureteral damage injury during a complex hernioplasty.

Conflict of interest None.

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