Functional medicine

Inguinal hernia of the distal ureter causing hydronephrosis: A rare case

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ABSTRACT

Ureteral involvement in inguinal hernias is a rare occurrence. A 63-year-old man presented for surveillance of renal cell carcinoma with new onset mild intermittent flank pain. CT scan revealed new left hydronephrosis and discopreoperative diagnosis of hydronephrosis to the level of the inguinal canal with dilated segments of ureter within an inguinal hernia. The patient underwent robot-assisted laparoscopic left ureterolysis and hernia repair. Ureter-containing inguinal hernias represent an uncommon but important source of obstructive uropathy. When encountered, robotic hernia repair provides a safe and effective treatment option.

Introduction

Inguinal hernias occur when abdominal contents budge through a weak area of the abdominal wall, often provoked by increased intra-abdominal pressure. The protruding area may be painful and the contents of the hernia may also be trapped or “incarcerated”, potentially leading to strangulation. The contents of an inguinal hernia may vary but typically includes small bowel or the omentum, and less commonly the appendix, ovaries, bladder or colon. We present a unique case and management of the distal ureter herniating into the inguinal canal.

Case presentation

A 63-year-old man with a history of chronic kidney disease who underwent a right partial nephrectomy for renal cell carcinoma, presented for cancer surveillance. In the interim, he reported new onset intermittent left flank pain and physical exam revealed mild left costovertebral angle tenderness. Metabolic panel showed a serum creatinine level of 1.8mg/dL and an estimated glomerular filtration rate of 39mL/min/1.73m², similar to his baseline levels.

Surveillance computed tomography scan showed no evidence of tumor recurrence but new left hydronephrosis (white arrow) to the level of the left inguinal canal (red arrow) containing fat and a dilated segment of left distal ureter (yellow arrow) (Fig. 1. Panel A and B).

The patient underwent an uncomplicated robotic-assisted laparoscopic left ureterolysis (ureter highlighted with yellow arrow; dash = proximal ureter, dot = distal ureter) and repair of his left inguinal hernia (red arrow) (Panel C). He was positioned in the supine position and three robotic 8mm ports and an assistant port were placed to triangulate the pelvis. The proximal left ureter identified proximally in retroperitoneum and the peritoneum over the inguinal ring was incised raising a flap that was reflected laterally exposing the deep inguinal ring. The distal ureter was identified exiting the ring passing medially and was gently retracted and dissected free from the ring. The ureter was repositioned into the normal retroperitoneal location with retroperitoneal fat and wrapped to secure and isolate from the surgical site. The conjoint tendon and inguinal ligament were approximated with running 2-0 Prolene followed by coverage with a mesh patch secured with 3-0 Vicryl in an interrupted fashion.

The patient was discharged the same day without complication. On 6-month follow-up, he remains asymptomatic, the hydronephrosis has resolved and he is without disease recurrence.

Discussion

While inguinal hernias involving the bladder are well described, the inclusion of the ureter remains an uncommon phenomenon as it is a retroperitoneal structure. Intra-operative discovery of a hernia involving the ureter was first described in 1892 and the first pre-operative discovery was reported in 1946. Since then, less than 200 cases have been reported in the published literature. There are two variations among hernias involving the ureter – para-peritoneal (80%) and extraperitoneal (20%) – both of which are usually via indirect herniation. To our
knowledge, there have been only 2 cases of robot-assisted laparoscopic repair, with only one of involving the ureter without concurrent bladder herniation.\textsuperscript{2,4} We present a case of a left distal ureter herniated within the left inguinal canal, and subsequent robot-assisted left inguinal hernia repair with mesh.

As in our case, ureteral hernia may present with or without obstructive symptoms including hydronephrosis.\textsuperscript{5} Even in the presence of hydronephrosis, patients may or may not present with symptoms such as ipsilateral flank pain. If the bladder is also involved, bladder outlet obstruction may result causing lower urinary tract symptoms including frequency, urgency and difficulty emptying.\textsuperscript{5} Widespread use of cross-sectional imaging has lead to more pre-operative diagnosis of ureteral hernias. However without obvious bladder involvement or a urography phase to highlight the urinary system, the presence of ureteral herniation may be difficult to fully ascertain with hydronephrosis is not present.\textsuperscript{5} Thus, when as hernia is found intra-operatively or planned for repair, surgeons should have a high index of suspicion that critical structures may be present within the hernia or sac, including the ureter, particularly in the setting of ipsilateral flank pain, renal failure or hydronephrosis.

Early in the implementation of the Da Vinci robotic surgical system platform, it was believed that the presence of the ureter within the hernia forbade the use the laparoscopic and robotic approaches.\textsuperscript{1} With increased comfort and expertise, this has proven to be at the discretion of the treating surgeon. Cetrulo et al. reports a large hernia consisting of the bladder and both ureters successfully repaired via a robotic approach.\textsuperscript{4} In either open, laparoscopic or robotic approaches, care must be taken to ensure proper dissection and removal of the ureter without injury.\textsuperscript{1} If difficulty occurs or for further pre-operative evaluation, cystoscopy with retrograde pyelogram may also be performed for anatomical clarification.

**Conclusion**

In summary, hernias involving the ureter remain an uncommon occurrence. They must however remain high on the differential diagnosis in order to avoid iatrogenic injury, particularly in the setting of ipsilateral flank pain, renal failure or hydronephrosis. Robot-assisted laparoscopic hernia repair provides a safe and effective option for herniorrhaphy in expert hands.

**Declaration of competing interest**

None.

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