

## Clinical Image

# Ureteral Inguinal Hernia Presenting with Ipsilateral Hydronephrosis

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## CLINICAL IMAGE

A 72 year-old male was admitted to the hospital with flash pulmonary edema and hypertensive emergency. Renal artery duplex ultrasound performed in work-up of hypertension revealed right-sided hydronephrosis. Ultrasonography demonstrated marked hydronephrosis and a duplicated collecting system (Figure 1). Computed tomography (CT) of the abdomen and pelvis showed a large right inguinal hernia that appeared to contain the right ureter and was causing moderate hydronephrosis (Figure 2). The patient endorsed a multi-year history of an asymptomatic right inguinal hernia. The patient's serum creatinine rose from 1.1 mg/dL at baseline to 1.4 mg/dL, indicating a stage I acute kidney injury. The patient elected to undergo inguinal hernia repair during the same hospitalization after his medical condition had stabilized. A Lichtenstein repair with mesh was performed. The patient tolerated the procedure well, his kidney function normalized, and he was discharged on post-operative day #2.

Involvement of the ureter with an inguinal hernia is rare, with only about 140 cases reported as of 2009 [1]. Ureteroinguinal hernias come in two varieties: paraperitoneal and extraperitoneal [2]. Both are usually indirect hernias. The paraperitoneal type is more common (80%); here, the ureter is involved as part of the hernia sac wall. The paraperitoneal type is therefore a sliding hernia. Paraperitoneal ureteroinguinal hernias are



**Figure 1** Renal ultrasonography shows marked hydronephrosis of the right kidney. A duplicated collecting system was also seen (not pictured).

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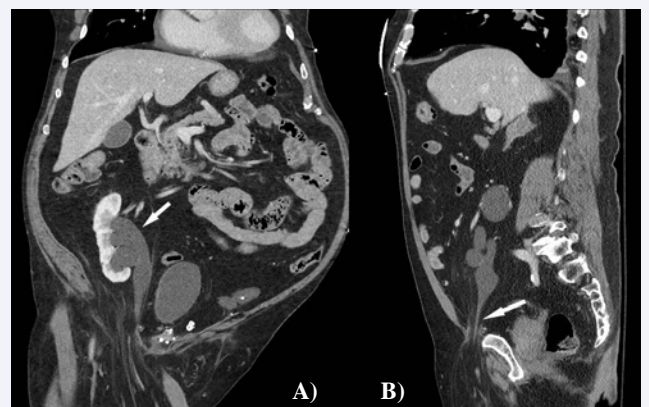
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**Figure 2** CT of the abdomen and pelvis. a) Marked hydronephrosis (arrow) of the right kidney can be seen on coronal images, with the right ureter extending caudally with the inguinal hernia. b) On sagittal section, the ureter can be seen extending into the inguinal canal (arrow).

thought to develop through traction on the ureter by abnormally adherent posterior parietal peritoneum. In contradistinction, extraperitoneal ureteroinguinal hernias do not involve a hernia sac. Extraperitoneal ureteroinguinal hernias are thought to be the result of an embryologic anomaly whereby the ureteric bud fails to separate from the Wolffian duct as it descends to form the epididymis and testis [3].

In either type of ureteroinguinal hernia, obstructive uropathy and urological symptoms are variably present, regardless of the length of ureter involved. Diagnosis of ureteroinguinal hernia is usually made intraoperatively, but preoperative diagnosis helps to prevent inadvertent injury. Gellett describes preoperative diagnosis by CT with confirmation on delayed post-contrast three-dimensional reconstruction [4]. Since adjunctive studies are not routinely performed during the work-up of an inguinal hernia, a high awareness of the ureteroinguinal hernia by the surgeon is required to avoid potential ureteral damage.

Repair of ureteroinguinal hernias may involve simple reduction of the ureter with the hernia sac during open repair, or it may require resection of the redundant ureter with primary anastomosis or ureteroneocystectomy. Ureteral protection with

a ureteral stent improves the identification of an involved ureter when it is known preoperatively [5].

The present case demonstrates a paraperitoneal ureteroinguinal hernia causing ipsilateral hydronephrosis in an adult male with no urinary complaints. Involvement of the ureter was identified preoperatively on CT. The hernia was repaired primarily with mesh, and the ureter was reduced back into the retroperitoneum closer to its normal anatomic location.

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