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Graft Hydroureteronephrosis Secondary to Inguinal Hernia: A Report of Two Unusual Cases

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ABSTRACT

Allograft hydroureteronephrosis caused by ipsilateral inguinal hernia occurs rarely. Its close proximity to the spermatic cord structures places the ureter at risk for herniation into the internal inguinal ring. Likewise, the ureter is also at risk for injury during inguinal herniorrhaphy. We present two cases where such events occurred in two separate patients. In both cases, the patients were managed with percutaneous nephrostomy tube decompression followed by definitive surgical repair.

Implication for health policy/practice/research/medical education:
This article informs the medical providers of renal transplant patients that hydroureteronephrosis and allograft dysfunction may be caused by an ipsilateral hernia or due to injury after herniorrhaphy.

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1. Introduction

Hydroureteronephrosis following renal transplant has an incidence of approximately 3% (1). Despite the close proximity of the graft ureter to the internal ring, hydroureteronephrosis as a consequence of an inguinal hernia occurs rarely. We present two cases of hydroureteronephrosis relating to an ipsilateral inguinal hernia. In the first case, hydroureteronephrosis occurred as a result of ureteroinguinal herniation. In the second case, the patient developed hydroureteronephrosis following inguinal herniorrhaphy.

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2. Case 1

A 50 year old man with polycystic kidney disease underwent a deceased donor renal transplant seven years prior to presentation. He had done well and enjoyed a baseline creatinine of 1.6mg/dL on maintenance immunosuppression consisting of mycophenolate mofetil and sirolimus. The patient presented with abdominal pain and fever. Physical examination revealed abdominal tenderness at the right lower quadrant without peritoneal signs and an easily reducible right inguinal hernia. Laboratory tests were significant for a serum creatinine of 1.9mg/dL and leukocytosis to 15,000. Computed tomography (CT) suggested diverticulitis and identified transplant hydronephrosis. The patient was hydrated and provided intravenous antibiotics for the diagnosis of diverticulitis. Abdominal pain improved and the patient defervesced.

Figure 1. Nephrostogram Showing Lack of Contrast Below Inguinal Ligament (arrow).

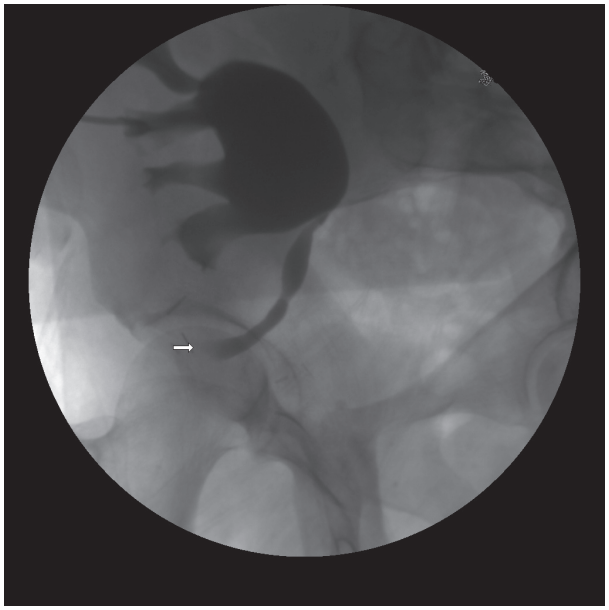
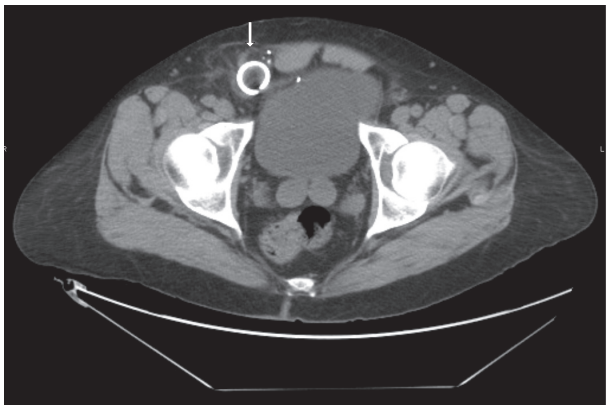


Figure 2. Computed Tomography Identifies the Distal End of the Ureteral Stent (arrow) within the Inguinal Hernia.



His creatinine, however, increased to 3.4 mg/dL. Nephrostomy tube was placed and a nephrostogram *(Figure 1)* showed no contrast beyond the level of the inguinal ligament, suggesting the ureter was obstructed at the site of the inguinal hernia. Following the procedure, the creatinine improved to 2.0 mg/dL. Subsequently, an antegrade ureteral stent was placed and the creatinine returned to baseline. Surgical intervention was delayed due to his immunosuppression. Sirolimus, known for poor wound healing, was discontinued and tacrolimus initiated in anticipation of herniorrhaphy. Unfortunately, the patient returned with fever and a repeat CT was obtained *(Figure 2)*. He was found to have a urinary tract infection and cellulitis at the nephrostomy site. Antibiotics were initiated and the nephrostomy tube and ureteral stent were exchanged. Upon resolution of his infection and undetectable sirolimus level, the patient underwent right inguinal herniorrhaphy. At surgery, a three centimeter defect was identified in the abdominal wall, lateral to the internal ring and spermatic cord. The transplant ureter was found to be prolapsing through the defect. It was released from its attachments and reduced back into the abdomen. The defect was primarily closed by approximating the surrounding fascial structures using interrupted prolene sutures. A Lichtenstein herniorrhaphy utilizing polypropylene mesh was performed. Post-operatively, the creatinine remained at his baseline of 1.6 mg/dL. The nephrostomy tube and ureteral stent were removed without recurrence of hydroureteronephrosis or graft dysfunction.

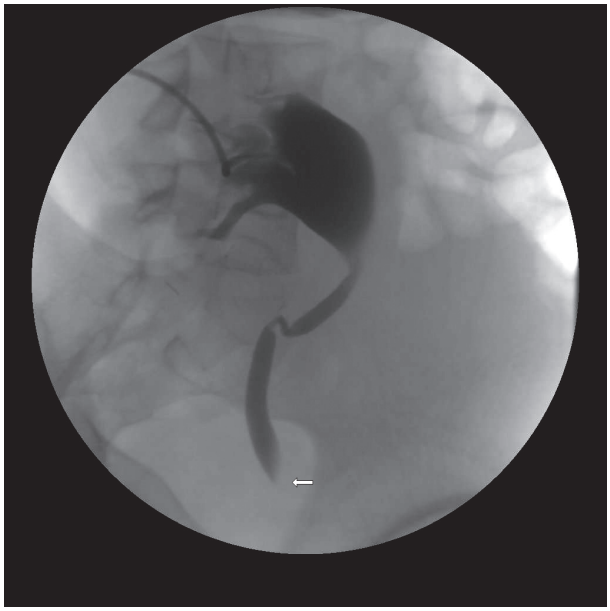
3. Case 2

A 25 year old man with reflux nephropathy received a living related renal transplant from his mother six years prior to admission. He presented for outpatient inguinal hernia repair. His baseline creatinine was 1.3 mg/dL. At the time of surgery, a pantaloon hernia with a sliding component to the direct hernia involving the bladder was identified. The direct hernia sac was opened and the bladder reduced. A Lichtenstein herniorrhaphy with polypropylene mesh was utilized. He was discharged home but returned two days post-operatively with complaints of nausea and abdominal pain. Laboratory study was significant for an elevated creatinine of 8.7 mg/dL and an ultrasound of the renal allograft identified moderate hydroureteronephrosis. Antegrade nephrostogram identified a “kink” in the mid ureter *(Figure 3)*. Because the renal dysfunction occurred immediately after herniorrhaphy, the patient was taken to the operating room for exploration of his ureter via the herniorrhaphy incision. In surgery, the polypropylene mesh was dissected and removed. A prolene suture was noted to have caught the transplant ureter. This suture was removed and the ureter appeared viable. Simultaneous cystoscopy was performed and a retrograde ureteral stent was placed. A Lichtenstein herniorrhaphy with Alloderm (Lifecell, Branchburg, NJ) was performed. Post-operatively, the patient did well with normalization of his creatinine. The nephrostomy tube and ureteral stent were removed four weeks later without recurrence of hydroureteronephrosis or graft dysfunction.

4. Discussion

A sliding hernia incorporating the ureter after renal transplantation is a rare cause of obstructive uropathy (2-5). There are two types of sliding hernia involving the ureter (6). The more common type, occurring in 80% of cases, is the paraperitoneal variant in which the ureter slides beside the hernia sac. Occasionally, other organs are also involved. The extraperitoneal variant involves a ureter without a hernia sac. The ureter is often accompanied by retroperitoneal fat, similar to the first case pre-

Figure 3. Nephrostogram with Abrupt Cutoff at Level of Inguinal Ligament (arrow).



Also note "kinking" of the mid ureter without proximal dilatation.

sented here. The second case represents hydroureteronephrosis caused by entrapment of the transplant ureter with a stitch during herniorrhaphy. Only one such event has previously been reported (7). In both cases, the patients presented with graft dysfunction and hydroureteronephrosis subsequently diagnosed by ultrasonography. A percutaneous nephrostomy tube with contrast injection served both diagnostic and therapeutic purposes. Placement of an antegrade ureteral stent may relieve the obstruction, as in the first case. Meanwhile nephrostomy drainage allows for decompression and optimizes the patient for surgical exploration. For transplant ureteroinguinal herniation, repair can be approached similar to conventional open inguinal herniorrhaphy. However, the normal extraperitoneal anatomy of the groin may be distorted as a consequence of the previous dissection for the transplant. Once dissected from other hernia contents, the isolated ureteral segment must be carefully examined for its viability. Diseased or significantly dilated areas require resection, reanastomosis, or reimplantation. Otherwise, the ureteral segment can simply be reduced and the hernia repaired in the usual fashion, as was the case in the first patient in our report. Hydroureteronephrosis that develops immediately after ipsilateral inguinal herniorrhaphy requires surgical exploration. Again, the ureter must be evaluated for its viability and a diseased ureter will require resection, reanastamosis of reimplantation. In our case, the ureter appeared viable so we elected to place a retrograde ureteral stent intra-operatively. Postoperative management includes monitoring the creatinine level to ensure normalization to baseline levels, removal of the ureteral stent and ensuring patency of the ureter with a nephrostogram prior to removal of the nephrostomy tube. Obstructive uropathy of a transplanted kidney as a result of an ipsilateral hernia is a rare event. Less common is the development of hydroureteronephrosis following ipsilateral inguinal herniorrhaphy. Nephrostomy tube placement is diagnostic and therapeutic. Definitive surgical exploration is indicated and is usually successful in treating both conditions.

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Conflict of interest

None declared.

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References

1. Shoskes DA, Hanbury D, Cranston D, Morris PJ. Urological complications in 1,000 consecutive renal transplant recipients. *J Urol.* 1995;**153**(1):18-21.
2. Osman Y, Ali-El-Dein B, El-Leithy R, Shokeir A. Sliding hernia containing the ureter--a rare cause of graft hydroureteronephrosis: a case report. *Transplant Proc.* 2004;**36**(5):1402-4.
3. Sanchez AS, Tebar JC, Martin MS, Bachs JM, Moreno MJ, Navarro HP, et al. Obstructive uropathy secondary to ureteral herniation in a pediatric en bloc renal graft. *Am J Transplant.* 2005;**5**(8):2074-7.
4. Ingber MS, Girdler BJ, Moy JF, Frikker MJ, Hollander JB. Inguinal herniation of a transplant ureter: rare cause of obstructive uropathy. *Urology.* 2007;**70**(6):1224 e1-3.
5. Furtado CD, Sirlin C, Precht A, Casola G. Unusual cause of ureteral obstruction in transplant kidney. *Abdom Imaging.* 2006;**31**(3):379-82.
6. Ballard JL, Dobbs RM, Malone JM. Ureteroinguinal hernia: a rare companion of sliding inguinal hernias. *Am Surg.* 1991;**57**(11):720-2.
7. Selman SH, Grecos GP, Koo BC. Anuria in transplant patient following inguinal herniorrhaphy. *J Urol.* 1985;**133**(4):669-70.