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Femoral herniation of transplanted ureter after deceased-donor kidney transplantation



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ABSTRACT

INTRODUCTION: Herniation of the ureter after kidney transplant is a rare and under documented event. Many of these herniations are due to abdominal wall defects or ureteral redundancy. After an extensive review of available literature, there has not been a reported case of a femoral herniation of ureter after kidney transplant. We report a case of late allograft renal transplant failure due to ureteral obstruction secondary to femoral herniation of the ureter.

CASE PRESENTATION: We report a case of 64 year old male with a history of kidney transplant, who was found to have an inguinal bulge. He was diagnosed with a femoral hernia containing transplant ureter using transplant kidney ultrasound and CT of the abdomen and pelvis. Subsequently he developed transplant kidney failure due to obstructive uropathy from the femoral hernia. The patient underwent a femoral hernia repair with biologic mesh. Compromised ureter was excised and a neoureterocystostomy was created. Post operatively his creatinine returned to baseline.

DISCUSSION: In our literature search there are two types of inguinal ureteral hernias described. Paraperitoneal, which makes up the majority of the cases, and extraperitoneal. There are no classifications for ureteral femoral hernias. We may extract these definitions to femoral hernias, as evidenced by our case where we encountered a paraperitoneal femoral hernia containing transplant kidney ureter.

CONCLUSION: To the best of our knowledge this is the first reported case of a femoral ureter hernia. Due to its rarity in the literature, an understanding of management is critical to patient outcome.

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1. Case presentation

We report a case of a 64 year old Caucasian male with a history of kidney transplant, after an aortic valve repair who was recovering in the Cardiac critical care unit. A consult was placed to the transplant surgery team on post-operative day four after aortic valve exploration and repair of a paravalvular prosthetic aortic valve leak, when the patient was found to have a rising creatinine level, a right groin hernia, and severe hydronephrosis seen on ultrasound (Fig. 1). The patient had a history significant for chronic kidney disease due to polycystic kidney disease. He had previously received a deceased-donor kidney transplant sixteen years prior. The patient then subsequently underwent bilateral nephrectomies. Since the transplant the patient had stable renal function and was able to stop dialysis. He denied any history of nephrolithiasis. Upon consultation in the ICU status post aortic valve repair, the patient's abdominal exam was soft and he had a right sided, inguinal bulge. Post operatively after his aortic valve repair, the patient developed dysuria after the removal of his Foley catheter. The patient also experienced frequency and urgency, no hematuria was noted.

The patient was treated with prophylactic Ciprofloxacin and for an UTI. The hernia was found to be reducible at the time. Therefore the decision was made to repair the hernia electively after he had recovered from his aortic valve repair. On post op day six after aortic valve repair, the patient became anuric and his metabolic panel showed a rise in creatinine from 1.89 to 3.66, BUN of 69 to 85 and a white count of 7.4 to 15.1. A contrasted CT showed an incarcerated femoral hernia with a distended allograft ureter in the femoral canal. (Figs. 2 and 3) The patient was taken to the operating room for repair of incarcerated femoral hernia.

The operation was initiated via laparoscopy. We entered the abdomen and identified that this was in fact a femoral hernia and was not compromising any bowel. It was difficult to identify any anatomic landmarks due to the distended ureter and hydronephrosis. Therefore, a pigtail catheter was introduced into the renal pelvis to relieve the hydronephrosis. The operation was converted to an open procedure due to the obscure anatomy. The hernia defect was in the femoral ring with a sac length about 5" × 4". This contained a dilated ureter that was ischemic and non-viable. (Figs. 4 and 5) The hernia sac was removed and sent for pathological examination. The mega ureter was not functioning and lacked peristalsis. The ureter was then dissected to its attachment to the bladder. The bladder was distended using normal saline and methylene blue using a

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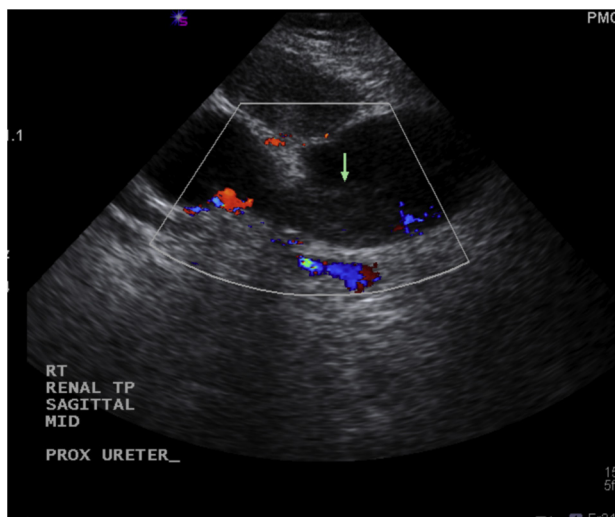


Fig. 1. Ultrasound demonstrating hydronephrosis of the proximal transplant ureter.



Fig. 3. Coronal view of the abdomen and pelvis CT demonstrating transplant kidney in the right lower quadrant and transplant kidney ureter in the femoral hernia. This image also demonstrates hydronephrosis and mesenteric stranding indicating incarceration of the transplanted kidney ureter.



Fig. 2. Axial view of CT scan of the pelvis demonstrating transplanted ureter in the right femoral hernia.

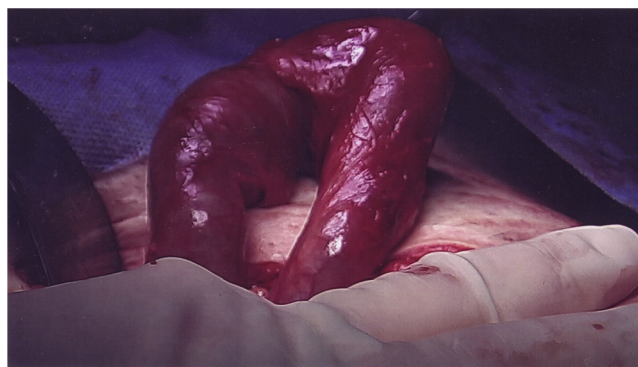


Fig. 4. Intraoperative photo of the transplanted ureter removed from the femoral hernia sac, with demonstration of hydronephrosis and hyperemia of the ureter.

3-way Foley catheter. The ureter was then divided at neoureterocystostomy. The distal portion of the ureter was still viable and had peristalsis. At this point, the decision was made to remove the necrotic portion of the ureter and re-implant the healthy portion of the allograft ureter to the bladder. After completing a new neoureterocystostomy, more methylene blue solution was injected into the bladder to check for a leak. A biopsy of the kidney was then sent to pathology. The hernia was repaired by using a biologic mesh.

Pathological examination of the hernia sack showed fibroadipose tissue consistent with a hernia sac with chronic and focal acute inflammation. The ureter segment showed hydroureter with extensive mucosal erosion, diffuse transmural acute inflammation, multifocal mucosal and intramural hemorrhage and transmural necrosis.

Post operatively patient did well. His diet was gradually advanced which he tolerated. His creatinine post operatively was 2.88 and at the time of discharge was 1.3. His urine output resumed to norm. He was then discharged on post-operative day six after hernia repair. Outpatient follow up after the surgery was unremarkable. Patient's creatinine remained at his baseline.

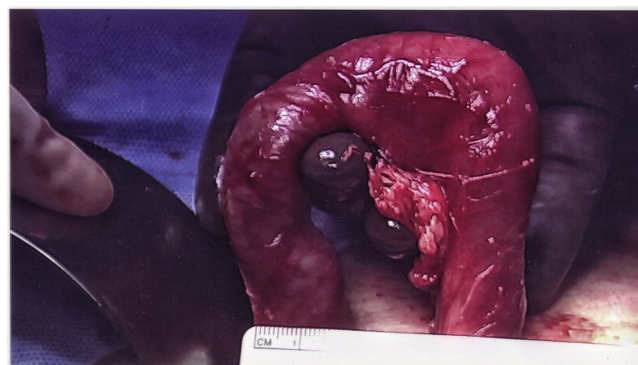


Fig. 5. Intraoperative photo of the transplanted ureter removed from the femoral hernia sac, with demonstration of hydronephrosis and hyperemia of the ureter.

2. Discussion

Abdominal wall hernia containing transplant ureter is a rare condition but however is described in the literature in the form of case reports. There are few cases of transplant ureters herniating

into the abdominal wall. There are multiple case reports submitted where transplant ureter was incarcerated in inguinal hernias [1–6]. For the best of our knowledge this is the first reported transplant ureter herniated into the femoral canal.

In our literature search there are two types of inguinal ureteral hernias described. Paraperitoneal, which makes up the majority of the cases, and extraperitoneal [7]. Paraperitoneal ureteral hernias have ureteral prolapse along with a peritoneal sac. Extraperitoneal ureteral hernias do not have a sac but may have retroperitoneal fat. There are no classifications for ureteral femoral hernias. We may extract these definitions to femoral hernias, as evidenced by our case where we encountered a paraperitoneal femoral hernia.

3. Conclusion

We report, as evidenced in our case, that herniation of transplant ureter may lead to hydronephrosis, obstructive uropathy, and eventually transplant kidney failure [4,8]. We propose prompt diagnosis with transplant kidney ultrasound [9] or CT imaging of the abdomen and pelvis. We also propose prompt repair of the hernia, rather than elective repair as the hernia may at any point become complicated with incarceration or strangulation and would lead to transplant kidney failure. Ischemic parts of the ureter may need resection. The goal should also be to decrease redundancy to avoid any future herniation, and to repair the hernia defect with mesh. As in our case, there may be a need to reconstruct a new neoureterocystostomy.

Conflicts of interest

No conflicts of interests.

Sources of funding

No funding.

Ethical approval

None.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Ashanthi Ratnasekera – Study design, data collections, paper writing.

Matthew Esposito – Study design, data collections, paper writing.

Ely Sebastian – Advisor, paper writing.

Nasser Youssef – Advisor.

Guarantor

Dr. Ely Sebastian.

References

- [1] A.Y. Odisho, F.E. Christophe, S.J. Tomlanovich, Inguinal herniation of a transplant ureter, *Kidney Int.* 78 (1) (2010) 115.
- [2] C.D. Furtado, C. Sirlin, A. Percht, G. Casola, Unusual cause of ureteral obstruction in transplant kidney, *Abdom. Imag.* 31 (3) (2006) 379–382.
- [3] M. Pourafkari, M. Ghofrani, M. Riahi, Inguinal herniation of a transplant kidney ureter: a case report, *Iran. J. Radiol.* 10 (1) (2012) 48–50.
- [4] D. Tran, J. Gaboriault, S. Collette, L. Senecal, M. Morin, A. Boucher, R. Dandavino, Obstructive uropathy caused by an inguinal hernia in a kidney transplant recipient: report of hernia cure by the shouldice technique, *Dialysis Transplant.* 40 (9) (2011) 413–414.
- [5] K.S. Eilber, S.J. Freedland, J. Rajfer, Obstructive uropathy secondary to ureteroinguinal herniation, *Rev. Urol.* 3 (2001) 207–208.
- [6] S.R. Shivde, J. Date, T.A. Dighe, P.M. Joshi, Unusual causes of obstruction to transplant ureter, *Saudi J. Kidney Dis. Transpl.* 21 (2) (2010) 310–313.
- [7] A. Lu, J. Burstein, Paraperitoneal inguinal hernia of ureter, *J. Radiol. Case Rep.* 8 (8) (2012) 22–26.
- [8] F. Youssef, P. Brown, J. Tappenden, J. Hall, F. Salim, B. Shrestha, Obstructive uropathy secondary to incisional herniation of a transplant ureter—case report and review of literature, *Ann. Transplant.* 18 (2013) 53–56.
- [9] L.H. Otani, S. Jayanthi, R.S. Chiarantano, A.M. Amaral, M.R. Menezes, G.G. Cerri, Sonographic diagnosis of a ureteral inguinal hernia in a renal transplant, *J. Ultrasound Med.* 27 (2008) 1759–1765.

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