

Recurrent Ureteric Obstruction due to an intraluminal hematoma following live donor renal transplant

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Keywords: Renal Transplant, End Stage Renal Disease, Ureteric Hematoma, Post Kidney Transplant Complications

Introduction

Kidney transplant is a well-established, definitive treatment modality for end stage renal disease (ESRD). Ureteric obstruction is a cause of anuria following kidney transplant and it accounts for 1-5% of cases with graft dysfunction [1]. Commonest cause of ureteric obstruction following kidney transplant is the development of ischemic stricture and other rare causes include lymphocele, extrinsic compression or intraluminal blood clot [1], [2]. We report a rare case of recurrent ureteric obstruction due to an intraluminal hematoma despite surgical evacuation and ureteric stenting, and its treatment course.

Description

This is a 56-year-old male with ESRD diagnosed for three years and had been on regular hemodialysis for two and half years. His was also known to have hypertension, ischemic heart disease (single vessel disease) managed with dual antiplatelet therapy, peripheral vascular disease (Fontaine I)

and poorly controlled diabetes mellitus. After thorough assessment and multidisciplinary meeting, he was prepared for live donor kidney transplant with a compatible donor, who was a 53-year-old lady without any medical co morbidities.

The left kidney of the donor was harvested uneventfully. The recipient's iliac arteries were exposed through retroperitoneal approach with a Rutherford Morrison incision, and it was decided to anastomose the renal graft to right internal iliac artery due to severe atherosclerosis disease of external iliac artery. The kidney was reperfused after 2 hours of cold ischemic time and the allograft had a good thrill at the hilum. Uretero – vesical anastomosis was done using 5/0 PDS and a 6Fr ureteric stent was placed with a use of guide-wire. Total surgical time was four hours and the blood loss was approximately 300ml.

Post reperfusion urine output was low despite adequate fluid resuscitation, Frusemide infusions, and catheter readjustment. Post-transplant renal graft duplex revealed normal blood flow in renal artery and vein. However there was moderate hydronephrosis with high resistive index of 0.8 throughout the kidney.

The decision was made to re- explore the renal graft after urgent multidisciplinary meeting in post-operative day 1. Exploration revealed well perfused renal graft with good thrill at renal hilum. However, the ureter was found to be obstructed by an organized hematoma despite the ureteric stent being in situ.

Ureteric hematoma was evacuated and ureter and bladder were flushed with heparinized saline. Urine flow was noted immediately following hematoma evacuation. Patients' urine output improved dramatically despite mild to moderate hematuria until 7 hours following the reopening, where he became acutely anuric for 3 consecutive hours. Renal duplex revealed moderate hydronephrosis and high resistive index of 0.9 throughout the kidney. Urgent team meeting comprising nephrology, urology, interventional radiology, and transplant surgical team was done, and it was decided to proceed with percutaneous nephrostomy insertion for decompression of the renal graft. Percutaneous nephrostomy was inserted 10 hours

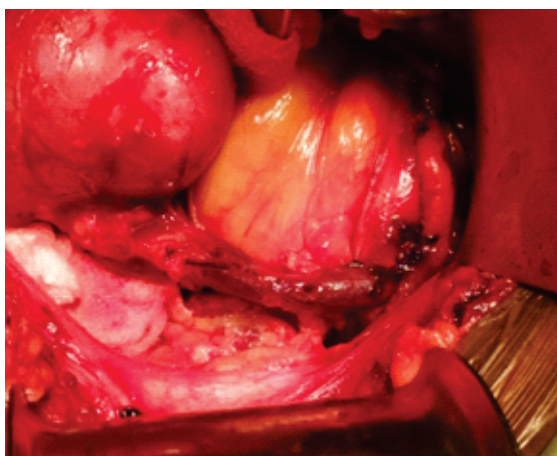



Figure 1. This picture shows completely occluded ureteric outflow due to an organized hematoma

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Received: 21-02-2022 Accepted: 26-11-2023

DOI: <http://doi.org/10.4038/sljs.v41i03.8946>



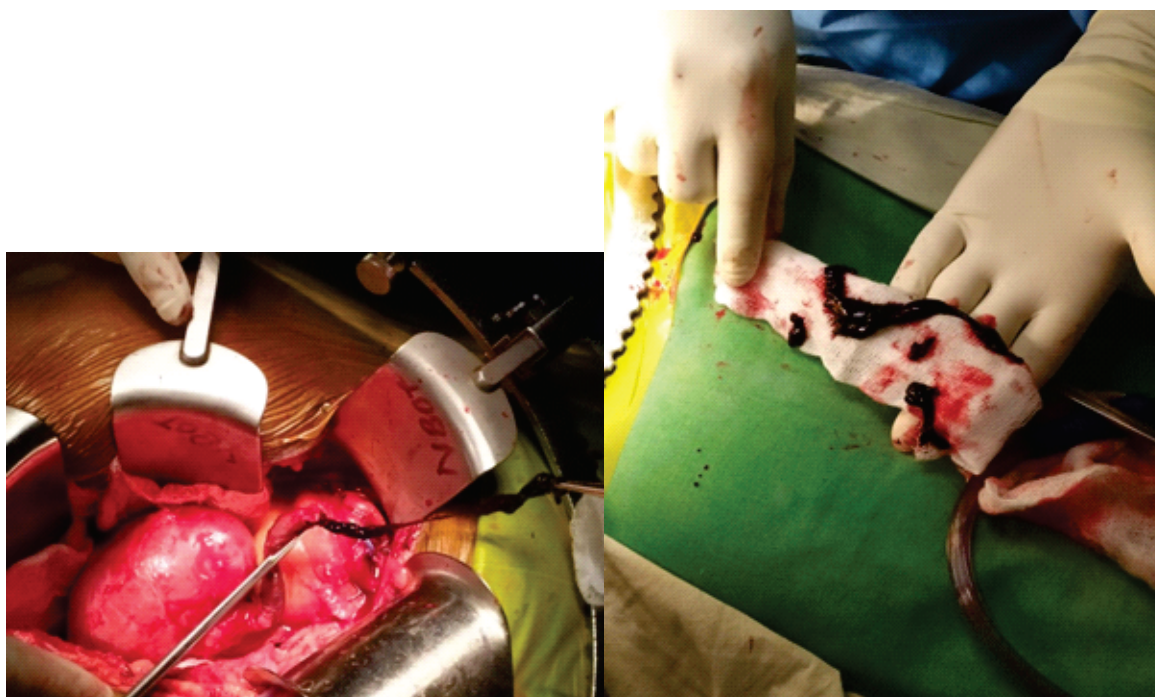


Figure 2 and 3 : Open retrieval of the hematoma

post re-exploration and urine output was detected through nephrostomy.

Post nephrostomy urine output was normal and the rest of recovery of the patient has been uneventful. He became polyuric from 4th day of post nephrostomy and increased in subsequent days. Patient received intensive care for 8 days and transferred to surgical ward for further care.

Patient's serum creatinine level dropped from 347 micromole/l to 124 micromole/l. The nephrostomy tube was removed as there was good urine output through the urinary catheter by day 8th day following the procedure. Patient was discharged on day 10 following the transplant.

Discussion

Ureteric obstruction in a transplanted kidney could be early or late. Early obstruction is often related to ureteric ischemia, a narrow anti-reflux tunnel at the uretero-vesical anastomosis or external compression by a lymphocele or hematoma, whereas late obstruction is usually due to ischemic fibrosis or vasculitis.

Obstruction of ureter in a transplanted kidney due to recurrent blood clots is an extremely rare event (2-10%), and it should be identified and treated promptly in order to preserve the renal graft function. This complication can pose a risk to graft, and, occasionally, to patients' survival [1].

According to literature search using PubMed data base, urethral obstruction, urine leak and vesico-ureteric reflux were the most common complications following renal transplant, and traditionally these patients were managed with open surgical techniques which carried higher patient morbidity.

However, with the recent advances in medicine, percutaneous / endoscopic approaches like percutaneous nephrostomy has been used to successful to treat ureteric obstruction following renal transplant [3].

Another study conducted on 582 post renal transplant patients between 1986 to 1993 in New York, states that modern endourological procedures have replaced the open reconstructive surgeries in the majority of the patients with urethral obstruction [4].

In our patient, the possible risk factor for recurrent ureteric obstruction due to a hematoma includes placement of ureteric stent with the use of blind uphill guidewire which could have injured the renal pelvis.

Once ureteric obstruction is suspected or confirmed immediate steps should be taken to minimize the kidney damage. Our patient once diagnosed initially was reopened to relieve the ureteric obstruction. However, ureteric obstruction was progressive despite the stent in situ. Following a multi-disciplinary team meeting, we had opted

for percutaneous nephrostomy as a temporary measure. Following this the patient's urine output significantly improved and the creatinine level dropped.

Percutaneous nephrostomy poses a risk of bleeding, sepsis and injury to the surrounding viscera; however, these can be mitigated by ensuring adequate platelets, hemoglobin and the coagulation time. While the sepsis can be managed with intravenous antibiotics. However, it being a minimally invasive procedure the benefits of percutaneous nephrostomy outweigh the risks.

Following percutaneous nephrostomy tube insertion, our patient made a faster recovery in transplanted kidney function. Nephrostomy tube was draining urine while the intrinsic Urokinase (in the urine) would dissolve intraureteric thrombi [5].

Conclusion

Great caution must be administered during insertion of a stent along with a guidewire in renal transplant. Ureteric stent will not prevent complete occlusion of the renal outflow by an organized hematoma. In such situations, the best modality in treating ureteric obstruction is percutaneous nephrostomy.

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Learning Points:

- Ureteric obstruction accounts for 1-5% of cases of anuria following kidney transplant, of which the most common cause is the formation of an ischemic stricture.
- Obstruction of ureter in a transplanted kidney due to recurrent blood clots is an extremely rare event (2-10%)
- Ureteric obstruction following kidney transplant can be effectively managed with minimally invasive procedures such as percutaneous nephrostomy.
- Minimally invasive techniques are preferred over open nephrostomy as it carries lesser patient morbidity.