

PYELO-NATIVE-URETERAL ANASTOMOSIS IN URETERAL STRICTURE DUE TO IATROGENIC TRAUMA OF KIDNEY TRANSPLANTATION: A CASE REPORT

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ABSTRACT

Introduction: Kidney transplantation may encounter challenges from medical or surgical complications. Iatrogenic injuries are responsible for more than half of ureteral stricture cases, which are a rare (0.6% to 12.5%) yet complex challenge in the realm of urology surgery. **Objective:** In this report, we presented a case stricture ureteral resulting from iatrogenic trauma in the context of kidney transplantation that was treated using pyelo-native-ureteral anastomosis. **Case(s) presentation:** A 33-year-old woman post-kidney transplant with iatrogenic ureteral trauma and developed recurrent urinary tract infections (UTI), Retrograde Pyelogram (RPG) was performed showing a partial stricture of proximal and distal right ureteral. Pyelo-to-Native Ureteral Anastomosis was performed to overcome the complication. After 35 days, kidney function was improved, USG and RPG for the improvement of hydronephrosis. **Discussion:** Pyelo-to-native ureteral anastomosis is a feasible treatment option for complex post-transplant ureteral strictures, particularly when endourological approaches are unsuccessful. **Conclusion:** Pyelo-to-native ureteral anastomosis can be an alternative treatment for stricture following kidney transplantation.

Keywords: Kidney transplant, ureteral stricture, pyelo-to-native ureteral anastomoses.

ABSTRAK

Pendahuluan: Transplantasi ginjal dapat menghadapi tantangan dari komplikasi medis atau bedah. Cedera iatrogenik bertanggung jawab atas lebih dari separuh kasus penyempitan ureter, yang merupakan tantangan yang jarang terjadi (0,6% hingga 12,5%) namun kompleks dalam bidang bedah urologi. **Tujuan:** Dalam laporan ini, kami menyajikan kasus striktur ureter akibat trauma iatrogenik dalam konteks transplantasi ginjal yang ditangani dengan anastomosis pyelo-ureter asli. **Presentasi kasus:** Seorang wanita berusia 33 tahun pasca transplantasi ginjal dengan trauma ureter iatrogenik dan mengalami infeksi saluran kemih (ISK) berulang, dilakukan Retrograde Pyelogram (RPG) yang menunjukkan adanya penyempitan parsial pada ureter kanan proksimal dan distal. Anastomosis Pyelo-to-Native Ureteral dilakukan untuk mengatasi komplikasi tersebut. Setelah 35 hari, fungsi ginjal membaik, USG dan RPG untuk perbaikan hidronefrosis. **Diskusi:** Anastomosis Pyelo-to-Native Ureteral merupakan pilihan terapi yang layak untuk striktur ureter pasca transplantasi yang kompleks, terutama ketika pendekatan endourologis tidak berhasil. **Simpulan:** Anastomosis Pyelo-to-Native Ureteral dapat menjadi tatalaksana alternatif untuk penyempitan setelah prosedur transplantasi ginjal.

Kata kunci: Transplantasi ginjal, striktur ureter, anastomosis pyelo-to-native ureteral.

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INTRODUCTION

Kidney replacement therapy, such as kidney transplants, is indicated in patient with end-stage chronic kidney disease.¹ Medical or surgical complications can provide a difficulty to kidney transplantation (KT). Surgical risks include wound infections, lymphocele formation, vascular issues, bleeding, and urinary difficulties (such as leaks or constricted ureters).²

After kidney transplantation, ureteric complications significantly raise morbidity and death rates. 75% of ureteral strictures are caused by iatrogenic injuries, which is an uncommon but important problem in reconstructive urology. Serious immediate and long-term consequences, such as the development of urinoma and abscesses, sepsis, fistula formation, chronic renal impairment, and possible loss of renal function, can result from neglecting to treat these strictures.³

Furthermore, among kidney recipients, incidence rates of ureteral stricture varied from 0.6% to 12.5%.^{4,6} Most occurrences of ureteral stricture affected the distal ureter appear three months after transplantation. Inadequate transplant ureteral preparation, distal ureteral ischemia, technical difficulties during implantation, rejection episodes, infections like human polyoma BK virus nephropathy, or external compression from lymphocele or hematoma formation are some of the factors that contribute to ureteral stricture.⁴

Interventional treatment or open surgical reconstruction are necessary for most ureteral strictures. Both endoscopic and surgical treatments have advantages and disadvantages. Guidelines for the selection of interventional therapy or open surgery are lacking, as is agreement on the best course of treatment for ureteral stricture.⁷

In this report, we presented a case stricture ureteral stricture resulting from iatrogenic trauma in the context of kidney transplantation that was treated using pyelo-native-ureteral anastomosis.

CASE(S)PRESENTATION

A 33-year-old woman was referred to urology by the internal medicine department after being diagnosed with end-stage chronic renal disease and having been on routine hemodialysis due to hypertension for three years. The patient's creatinine level was 8.65 mg/dl, and ureum was 96.3 mg/dl, with normal white blood cells, red blood cells, hemoglobin and neutrophil levels. A right kidney was transplanted with open surgery approach. Unfortunately, during the transplantation procedure, a surgical iatrogenic incident resulted in an injury to

the proximal transplanted ureter's lumen. The defect was repaired with continuous suture and omental wrap. The patient was discharged following an adequate recovery and urine production.

After several weeks, a retrograde pyelogram (RPG) was performed, and showed a partial stricture of the proximal and distal right ureters (1.8 cm and 0.8 cm, respectively), and the patient was diagnosed with UTI and a decrease in renal function. To manage the stricture, the patient received antibiotics and a Right Double J (DJ) stent was inserted (Figure 1).

Around 3 months later, the patient was admitted because of lower urinary symptoms and diagnosed as complicated UTI and treated with antibiotics. USG showed hydronephrosis in the transplanted kidney (Figure 2a). The urine cultured showed Extended-spectrum beta-lactamases. The stricture remained visible in RPG thus reinsertion of the DJ stent was performed.

The patient was readmitted due to urosepsis. Following urosepsis treatment, the patient had pyelo-to-native ureteral anastomoses performed. A retrograde pyelography was conducted to ensure the integrity of the native ureter that will be used.

The approach is performed by Gibson incision, with prior ilioinguinal retroperitoneal access. The pyelum of kidney donor is identified, mobilized, and sectioned and pyelo-to-native ureteral anastomoses is performed. PDS 5-0 suture is used as a watertight suture followed by reinsertion of the DJ stent into native ureter. Retroperitoneal drains were placed afterward (Figure 3).

Kidney function improved after 35 days of follow-up. USG (Figure 2b) and RPG (Figure 1c) was done for the evaluation of the improvement of hydronephrosis, and the patient underwent removal of DJ Stent.

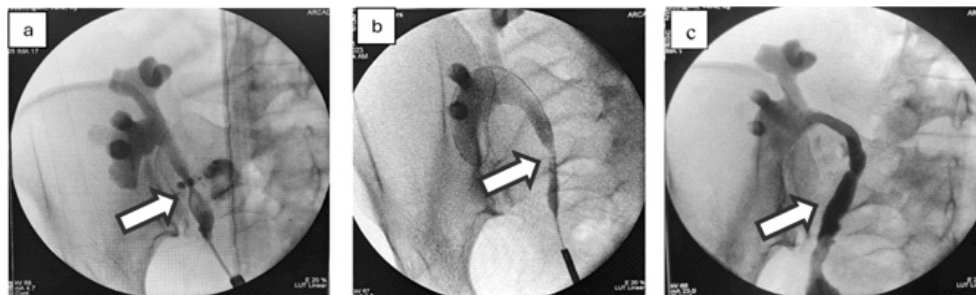


Figure 1. (a) Retrograde pyelography after kidney transplantation showed the stenosis in proximal and distal ureter; (b) Stenosis does not showed improvement even after 3 months DJ stent inserted; (c) after pyelo-to-native urethral anastomoses was performed, the stenosis was decreased.

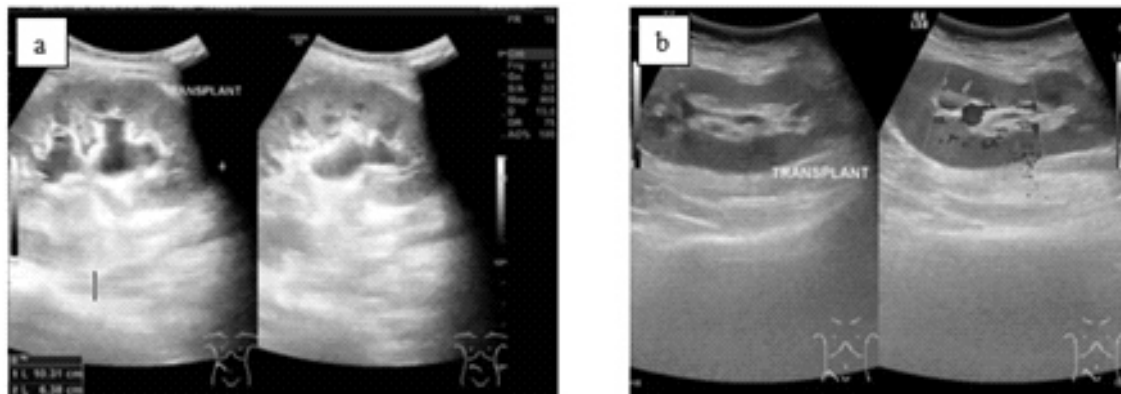


Figure 2. (a) USG after 3 months of transplanted kidney showed hydronephrosis; (b) USG evaluation after pyelo-to-native anastomosis showed improvement of hydronephrosis.

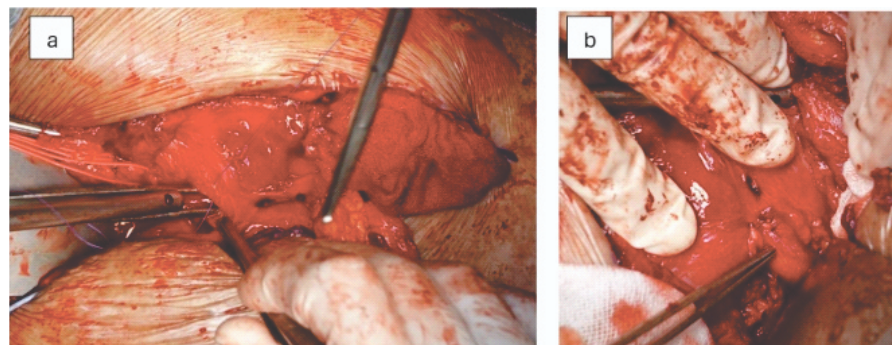


Figure 3. (a) Pyelo-to-native ureteral anastomosis; (b) and post procedure.

DISCUSSION

According to the European Association of Urology (EAU), an open kidney transplant with an extra-peritoneal route to either the iliac fossa is the operative method for the first single kidney transplant.⁸ The main cause of morbidity following renal transplantation is urological problems, including ureteral stricture, vesicoureteral reflux (VUR) and urinary leakage. While, urinary leakage and ureteral necrosis occur in 1%–5% of cases, whereas ureteral stricture ranges from 0.6% to 10.5%. The frequency of VUR can reach 50%, with 0.1%–1.1% of cases being severe.⁹ 2-10% of individuals who receive a kidney transplant experience ureteric blockage after surgery; these cases typically manifest within the first few weeks or the first year.¹⁰ According to Awadi et al., the incidence of iatrogenic ureteric injuries has decreased in the Kuwait Urology Department from 26 (31.7%) in 1998 to 10 (11.8%) in 2002; nonetheless, there is still a dearth of information

regarding iatrogenic ureteric trauma among transplant recipients.¹¹

The incidence of stricture occurs in 0.6 to 10.5% of cases, and early stricture is usually brought on by poor surgical skill or decreased ureteral blood flow after surgery.⁸ Longer warm ischemia duration, donors with more than two arteries, and older donor and recipient ages are additional risk factors.¹² Stricture induces urine stasis, increasing the risk of infection, as evidenced by numerous episodes of complex UTIs in this patient.

Late ureteral stricture typically requires revision surgery to repair the utero-vesical anastomosis or to perform a pyelo-ureteral anastomosis. Two approaches are classically described either a transperitoneal median allowing easy access to the native ureter, or a revision of the initial iliac approach.¹³ This patient had multiple strictures, surgical reconstruction of pyelo-to-native ureteral anastomosis was performed rather than minimally invasive techniques such as percutaneous balloon dilatation, antegrade flexible ureteroscopy,

or holmium laser incision, which are recommended in strictures less than 3 cm. However, their success rate is limited (45%-62%).¹⁴⁻¹⁵

Although using the native ureter has been shown to be a viable option, the predominant approach for reconstructing the urinary system during transplant surgeries is ureteroneocystostomy (UNC).⁹ Although pyeloureterostomy has been recognized as the primary surgical technique by number of studies, modern surgeons usually only use this technique when the donor ureter is shortened or as a reconstructive option after UNC has proven ineffective.¹⁶ When ureteroureterostomy and pyeloureterostomy are performed as initial procedures, the frequency of complications has been reported to range from 1.9% to 12.6%. A range that aligns with the reported complication rate of the extravesical UNC procedure, falling between 2% and 12%.¹⁷ Due to iatrogenic trauma to the ureter, pyelo-to-native ureteral anastomosis procedure was chosen in this case.

CONCLUSION

This case report highlights the importance of managing complications related to renal transplant. Pyelo-to-native ureteral anastomosis represents a choice for reconstruction following iatrogenic renal trauma, which offers both technical and functional advantages.

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ETHICS

Ethical approval for this case report was given by The Ethics Commission of Saiful Anwar General Hospital, Malang, Indonesia with approval number 400/014/CR/102.7/2024.

CONFLICTS OF INTEREST

The authors declare no conflict of interests.

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