

CASE REPORT

Renal autotransplantation: A final option to preserve the kidney after an iatrogenic ureteral injury

Napoleon Moulavasilis¹, Ioannis Katafigiotis¹, Dimitris Staios³, Christos Nikolaidis², Spyridon Vernadakis², John Bokos², Ioannis Anastasiou¹

¹ 1st Department of Urology, National and Kapodistrian University of Athens, Laiko Hospital, Athens, Greece;

² Renal Transplant Unit, Laiko Hospital, Athens, Greece;

³ Urologist, Laiko Hospital, Athens, Greece.

Summary *Background: Ureteral injuries are not very common and can occur after many surgical procedures. Kidney salvage is desirable. Renal autotransplantation is a final option for some cases. In this case, we report an autotransplantation of the kidney after an iatrogenic injury of the ureter with totally extraperitoneal approach.*

Case report: A 41 years old female underwent left endoscopic ureterolithotomy with holmium laser for ureteral calculi. An iatrogenic ureteral injury, probably ureteral avulsion, occurred. After multiple interventions, she referred to us with a nephrostomy tube. Imaging was performed and left renal autotransplantation was chosen as surgical management. The approach was totally extraperitoneal. No alteration of renal function or of urine outflow was observed during the follow up.

Conclusions: The report supports the safety and efficacy of renal autotransplantation.

KEY WORDS: Ureteral injury; Iatrogenic; Renal autotransplantation; Totally extraperitoneal.

Submitted 7 July 2019; Accepted 20 July 2019

INTRODUCTION

Iatrogenic ureteral injuries are not a very common complication of urologic and non urologic surgery, but it can be quite challenging to correct them. Salvaging the kidney function and repairing the defect are of paramount importance. Treatment depends on the extent of the ureteral trauma and the site of the injury. Minor injuries can be treated endoscopically with ureteral stent placement, but can relapse. More serious injuries or relapses of minor injuries may require more complicated interventions such as ureteral reimplantation with psoas hitch or Boari flap, or uretero-ureteral anastomosis. Even these more advanced techniques cannot treat the proximal ureter defects, due to short length of healthy ureter (1). Renal autotransplantation is a suitable option for such cases. The first case was performed by *JD Hardy* in 1963 to repair a ureteral injury, but its implementation is still limited. We present a case of an iatrogenic ureteral injury with failed endoscopic management that resulted in autotransplantation of the kidney.

CASE REPORT/CASE PRESENTATION

A 41 year old female was referred to us after a prolonged

history of multiple interventions that resulted in the permanent placement of nephrostomy tube for renal drainage. The initial intervention was endoscopic ureterolithotripsy with holmium YAG laser for an impacted ureteral calculi. After complete but strenuous stone fragmentation and removal of semirigid ureteroscope, a complete ureteral avulsion was realised. An immediate open intervention was decided and patient underwent ureteral anastomosis and ureteral stent placement. Patient's post op course was uneventful and she was discharged five days later. Two months postoperatively the patient returned to the treating physicians because of abdominal pain and high fever of 38.5°C. Emergency imaging with a CT scan revealed a retroperitoneal abscess around the left kidney extending further to the psoas muscle. Patient underwent open drainage, recovered and was discharged again with a indwelling ureteral stent. Eight months later the patient had a relapse of fever and abdominal pain and CT scan again revealed a retroperitoneal urinoma, that was percutaneously drained. Patient was discharged again after clinical improvement with an indwelling ureteral stent and a Foley catheter for bladder drainage. Seven days later, patient complained of abdominal pain, nausea and vomiting. An ultrasound reported fluid around the kidney extending to the psoas muscle. An attempt to replace the double J stent failed, a percutaneous nephrostomy was placed instead and an ureteral catheter was placed retrogradely. Thereafter the patient was referred to our hospital. A treatment strategy was planned. Firstly, a computer tomography was performed. The report described that the ureteral catheter drained the retroperitoneal fluid. Treatment was given for 6 weeks according to antibiogram of fluid culture following antimicrobial treatment guidelines. The exact site of the urinary tract injury and the extent of the ureteral trauma were investigated thereafter with antegrade pyelography and retrograde ureterography (Figure 1). An upper ureteral defect more than 15 cm in length was demonstrated. Moreover, *magnetic resonance imaging (MRI)* was performed.

Autotransplantation was chosen as surgical management. It was performed almost 1 year after the initial intervention (endoscopic ureterolithotripsy with holmium laser). In supine position, previous incision was revised and the approach was totally extraperitoneal (Figure 2). The kidney was completely mobilized and was harvested with

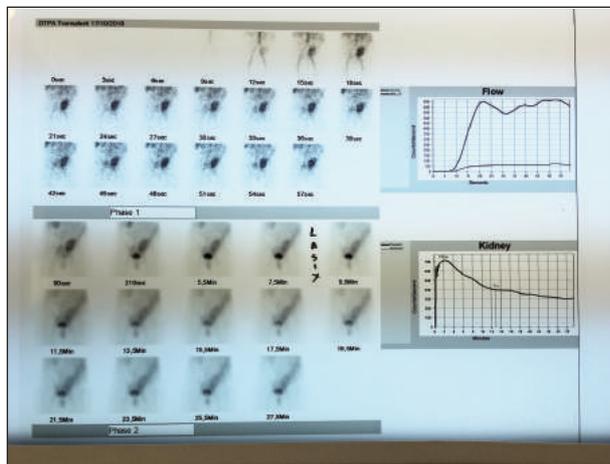
Figure 1.
Antegrade pyelography.



Figure 2.
Extraperitoneal approach.



Figure 3.
DTPA.



Thirty-two weeks after surgery, no signs of abnormalities of renal function or urine outflow were observed.

DISCUSSION

The management of major ureteral injury is always a challenge (2). It depends on the location and extent of

maximal artery and vein length. A healthy segment of the upper ureter was mobilized.

The renal vessels were anastomosed to the iliac vessels to reestablish renal perfusion and blood supply to the kidney was recovered within 40 minutes. The segment of the proximal ureter was anastomosed to the bladder. No intra-operative complications occurred.

Pigtail (double J stent) was left in the urinary tract for 4 weeks in order to provide safe urine flow from the transplanted kidney.

Fifteen days after the autotransplantation the patient was discharged from our hospital with good state of the auto-transplanted kidney and urinary tract function. Ultrasound Doppler and DTPA were used to confirm good arterial and venous flow of the transplanted kidney (Figure 3).

the injury. Renal autotransplantation is considered a suitable option for ureteral injuries especially when there is a major loss of ureteral length. Early recognition of the injury is very important because it is followed by minimally invasive procedure. Delayed recognition of injury requires treatment with extended procedures as well as high experience of the urologists. Repair of long defect of the ureter, especially of the proximal ureter, is a particularly difficult surgical challenge. There are no strict recommendations on the treatment of long ureteral lesions. The treatment choice for every case is unique. The decision for renal autotransplantation should be taken based on the extent and location of ureteral injury as well as patient preference and surgeon experience.

CONCLUSIONS

Iatrogenic ureteral injuries are relatively uncommon and the loss of a kidney is devastating. Renal autotransplantation in the setting of severe loss of ureteral length provides an option as it preserves the renal function (3). This report supports the safety and efficacy of renal autotransplantation.

COMPLIANCE WITH ETHICAL STANDARDS

Informed consent: Written informed consent was obtained from the patient for the publication of this Case Report/any accompanying images.

REFERENCES

1. Azhar B, Patel S, Chadha P, Hakim N. Indications for renal autotransplant: an overview. *Exp Clin Transplant.* 2015; 13:109-14.
2. Benson MC, Ring KS, Olsson CA. Ureteral reconstruction and bypass: experience with ileal interposition, the Boari flap-psoas hitch and renal autotransplantation. *J Urol.* 1990; 143:20-3.
3. Shekarriz B, Lu H, Duh Q, et al. Laparoscopic nephrectomy and autotransplantation for severe iatrogenic ureteral injuries. *Urology.* 2001; 58:540-3.

Correspondence

Napoleon Moulavasilis, MD (Corresponding Author)
napomoul@hotmail.com

Ioannis Katafigiotis, MD
katafigiotis.giannis@gmail.com

Ioannis Anastasiou, MD
ekati2@otenet.gr

1st Department of Urology, National and Kapodistrian University of Athens, Laiko Hospital
Agiou Thoma str., Athens (Greece)

Christos Nikolaidis, MD
chr.nikolaidis@gmail.com

Spyridon Vernadakis, MD
svernadakis@yahoo.com

John Bokos, MD
johnbokos@gmail.com

Renal Transplant Unit, Laiko Hospital, Athens (Greece)

Dimitris Staios, MD
dstaios@yahoo.com

Urologist, Laiko Hospital, Athens (Greece)