JSCR Journal of Surgical Case Reports

Journal of Surgical Case Reports, 2017;2, 1–4

doi: 10.1093/jscr/rjx028
Case Report

CASE REPORT

Immediate successful renal autotransplantation after proximal ureteral avulsion fallowing ureteroscopy: a case report

Mansor Alizadeh[1], Rohollah Valizadeh[2], and Mohsen Mohammad Rahimi[3,*]

[1]Department of Urology, Nephrology and Kidney Transplant Research Center, Urmia University of Medical Sciences, Urmia, Iran, [2]Department of Epidemiology, Student Research Committee, Urmia University of Medical Sciences, Urmia, Iran, and [3]Department of Kidney Transplantation, Nephrology and Kidney Transplant Research Center, Urmia University of Medical Sciences, Urmia, Iran

*Correspondence address. Nephrology and Kidney Transplant Research Center, Urmia University of Medical Sciences, Urmia, Iran. Phone: +98-914-462-3979; E-mail: mohsenrahimi273@gmail.com

Abstract

The patient was a 51-year-old lady with left flank colicky pain accompanied with nausea and vomiting for a month. Transurethral lithotripsy and ureteral stent placement was considered for the patient. The patient had a narrow ureteral lumen and while bringing the ureteroscope out, ureteral avulsion occurred at a distance approximately 4 cm from ureteropelvic junction. After bringing the uretroscope out, the avulsed ureter was observed hanging at the tip of the ureteroscope. Anastomosis of the ureter to the bladder was accomplished with Lich–Gregoir technique. A drainage tube was inserted at the site of incision and the surgical wound closed. The patient was discharged with acceptable general condition after 3 days and the drainage tube removed. The ureteral stent was removed 4 weeks later by cystoscopy. An ultrasound imaging study of the genitourinary system 8 months into the patients follow up showed normal size, echo and cortical thickness in the operated kidney after renal autotransplantation.

INTRODUCTION

Ureteral avulsion is conventionally defined as injuries of the ureter caused by blunt (non-penetrating) trauma with acute deceleration or acceleration movement mechanism due to motor vehicle accidents [1]. With the invention of endourology tools, ureteral avulsion can also occur as a result of stretching in the weakest point of the ureter [2]. Ureteral avulsion and perforation during ureteroscopy are the most common cause of iatrogenic ureteral injuries [3]. The rate of ureteral injury dropped to 7% in 1990 due to increased surgical experience and development of more advanced uertroscopy tools [4]. The incidence of ureteral perforation has been reported in 1.5% of such procedures of which 0.2% have required surgery [5]. In spite of the prevalent use of ureteroscopy in the treatment of ureteral stones and replacement of open surgical procedures with ureteroscopic procedures, the rate major and severe complications such as avulsion and perforation commands attention [6, 7]. Ureteral avulsion from the pelvis can be managed by ureteral reimplantation, transureteroureterostomy and ureteroneocystostomy [8–10].

Renal autotransplantation can be an appropriate whenever a considerable length of the ureter is lost or a previous surgery

Received: December 11, 2016. **Accepted:** February 3, 2017.

has failed. Meanwhile, sometimes after such procedure renal impairment is encountered [11].

In the present case, we report a successful autotransplantatioin in a patient who underwent urgent operation following avulsion of the ureter at a distance of 4 cm from the pelvis. Surgeons should be aware of possible complications attributed to transureteral lithotripsy (TUL) and their knowledge and expertize in managing such complications.

CASE REPORT

The patient was a 51-year-old lady with left flank colicky pain associated with nauseas and vomiting for a month. Study of KUB (kidney, ureter, and bladder x-ray) and non-contrast abdominopelvic spiral CT scan images revealed a 1-cm proximal left ureteral stone (Fig. 1). Accordingly the patient was selected to undergo TUL and ureteral stenting.

Due to a narrow ureteral lumen proceeding with the procedure seemed impossible and we decided to terminate the surgery. While taking out the ureteroscope we noticed avulsion of the ureter at a point approximately 4 cm from ureteropelvic junction. The avulsed ureter was handing on the tip of the ureteroscope and the avulsed fragment came out along with the ureteroscope. After thorough evaluation of various possible methods to approach the problem, the patient was brought to a left flank position from her original lithotomy position.

With a left intercostal incision nephrectomy was done. Subsequently, the position of the patient was changed to supine and a Gibson incision was made over the right lower quadrant of the abdomen. Following dissection of the iliac vessels, renal vessels were anastomosed to the iliac vessels (renal artery to the internal iliac artery and renal vein to the external iliac vein). Using the Lich–Gregoir technique, left kidney ureteral anastomosis to the bladder was done. Given the fact that only a short segment of the avulsed ureter (4 cm) was left, we considered implantation of the ureter to the bladder.

A ureteral catheter was inserted. A drainage tube was inserted to drain any possible bleeding from the operation site

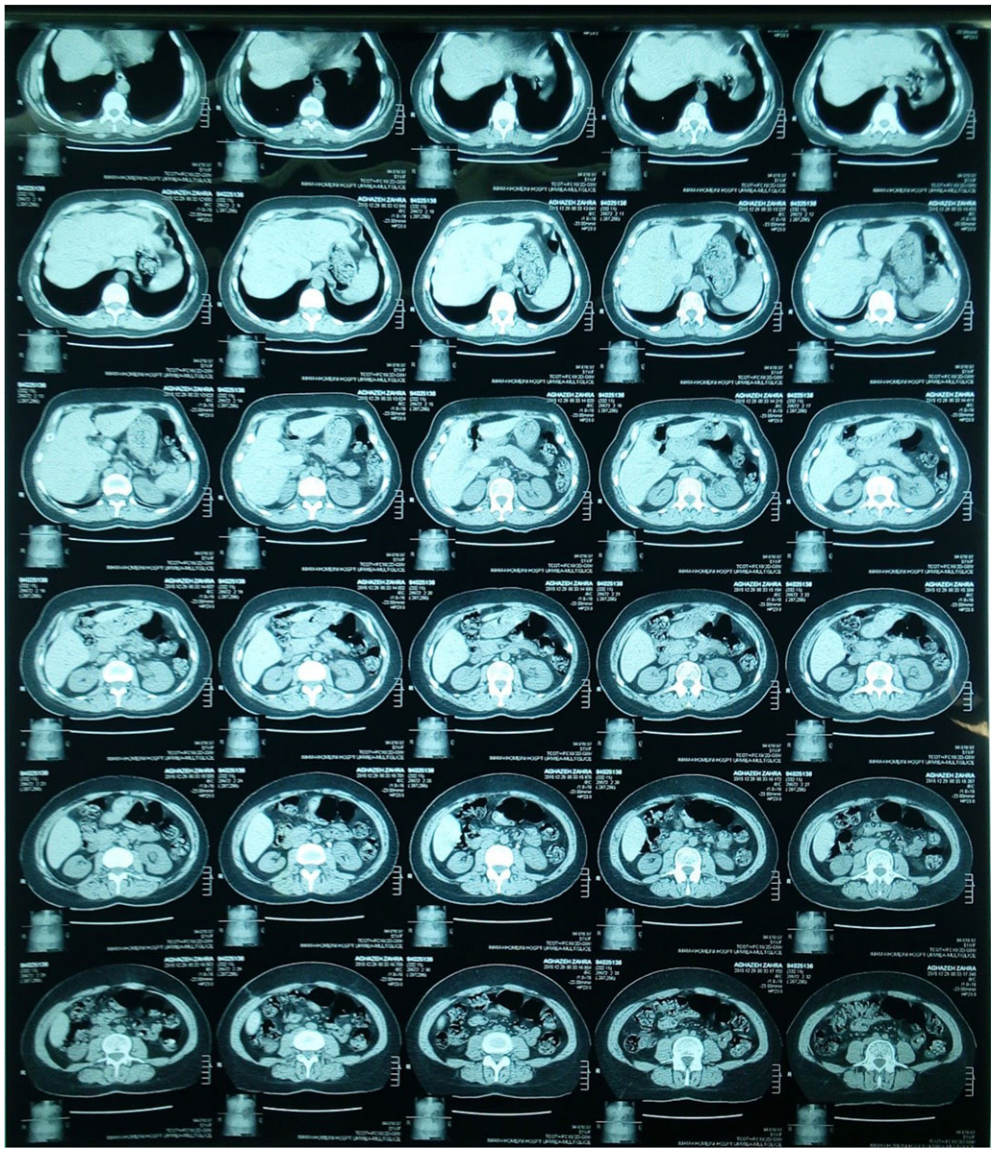

Figure 1: Abdominopelvic spiral CT scan of the patient before surgery.

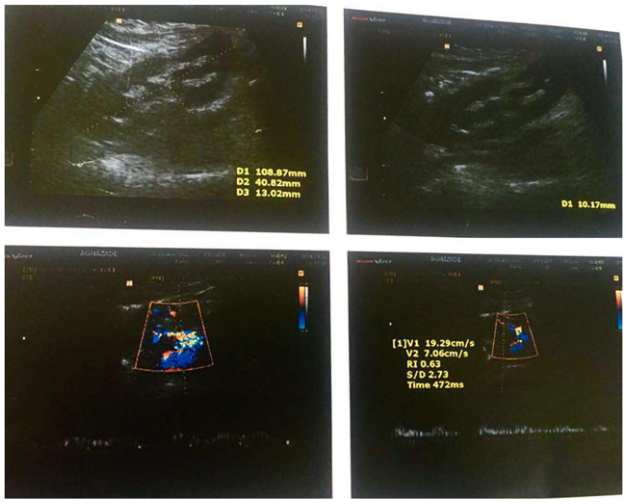

Figure 2: Color Doppler ultrasound of the transplanted kidney 2 months after surgery.

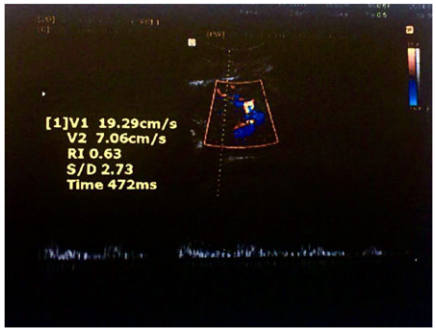

Figure 3: Color Doppler ultrasound of the transplanted kidney 2 months after surgery in the zoomed area of the image.

and then the surgical wound was closed. The patient was discharged in a good general condition after 3 days and the drainage tube removed. The ureteral stent was removed 4 weeks later by cystoscopy under local analgesia. An ultrasound imaging study of the genitourinary system 8 months into the patients follow up showed normal size, echo and cortical thickness in the operated kidney after renal autotransplantation.

In follow up, 2 months after renal autotransplantation, the arterial and venous flow of the transplanted kidney were normal on Color Doppler ultrasound imaging (Figs. 2 and 3). The mean parenchymal arterial vascular resistance in the transplanted kidney was 0.63 which was in the normal range. The height, anteroposterior diameter and cortical thickness of the transplanted kidney were 117.41 mm and 13 mm, respectively. The values of urea and creatinine 3 months after transplantation were 26.4 and 1.09, respectively. Size, echo and cortical thickness of the transplanted kidney were reported normal in the follow up ultrasound 8 months after autotransplantation (Fig. 4).

DISCUSSION

Ureteroscopy is widely used for lithotripsy procedure and resection of malignant tumors, but this method may lead to urethral mucosal trauma, hematuria, ureteral stenosis, urinary tract infection and ureteral perforation. Among all complications of ureteroscopic lithotripsy procedure, complete avulsion

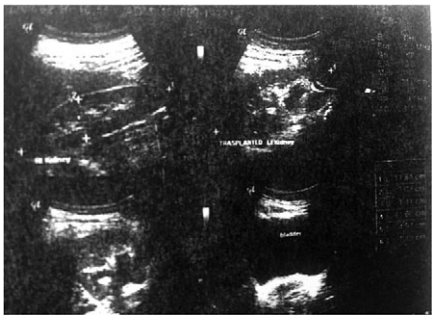

Figure 4: Gray-scale ultrasonography of the patient's transplanted kidney 8 months after surgery.

of the proximal ureter is one of the most challenging that happens in 0.06–0.45% of the cases [12].

It is evident that appropriate decision making and a timely surgical intervention can prevent the need for nephrectomy and possible complications in the future. In general, management of ureteral avulsion depends on the location of injury, the length of the traumatized ureter, time of diagnosis, patient's age and general health. There are different therapeutic methods for the treatment of this condition. Boari flap and psoas hitch techniques are used in proximal and distal injury of the ureter. Ureterourerterostomy and ileal interposition can also be used in medial injury of the ureter. Ileal interposition surgery involves complications such as electrolyte disturbances and stone formation [13]. Finally, in the absence of the previous conditions, autotransplantation can be done as a vital method [11].

It is evident that such surgical procedures require substantial expertize among all healthcare providers, a patient in a suitable physical status and proper age, and an accurate and timely decision making. Autotransplantation was done in our patient after quick evaluation and review of different options to repair a traumatized ureter and clinical evidences supported the accomplishment of a successful outcome.

CONFLICT OF INTEREST STATEMENT

None declared.

REFERENCES

1. Palmer JM, Drago JR. Ureteral avulsion from nonpenetrating trauma. *J Urol* 1981;**125**:108–11.
2. Hodge J. Avulsion of a long segment of ureter with Dormia basket. *Br J Urol* 1973;**45**:328.
3. Johnson et al. 2004. *Campbell–Walsh Urology*, 10th edn, 2012, **vol 2**, p.1181.
4. Huffman, 1989. *Campbell–Walsh Urology*, 10th edn, 2012, **vol 2**, p.1181.
5. Schuster et al. 2001. *Campbell–Walsh Urology*, 10th edn, 2012, **vol 2**, p.1181.
6. Butler et al. 2004. *Campbell–Walsh Urology*, 10th edn, 2012, **vol 2**, p.1181.
7. Gaizauskas A, Markevicius M. Possible complications of ureteroscopy in modern endourological era: two-point or 'scabbard' avulsion. 2014; 2014:308093.
8. Tulikangas et al. 2001. *Campbell–Walsh Urology*, 10th edn, 2012, **vol 2**, p.1184.

9. Matlaga BR, Lingeman JE. Surgical management of upper urinary tract calculi. *Campbell-Walsh Urol.* 2012;**10**:1360.
10. Mufarrij et al. 2007. *Campbell–Walsh Urology*, 10th edn, 2012, **vol 2**, p.1184.
11. Alapont JM, Broseta E, Oliver F, Pontones JL, Boronat F, Jimenez-Cruz JF. Ureteral avulsion as a complication of ureteroscopy. *Int Braz J Urol* 2003;**29**:18–22.
12. Ge C, Li Q, Wang L, Jin F, Li Y, Wan J, et al. Management of complete ureteral avulsion and literature review: a report on four cases. *J Endourol* 2011;**25**: 323–6.
13. Milonas D, Stirbys S, Jievaltas M. Successful treatment of upper ureteral injury using renal autotransplantation. *Medicina (Kaunas)* 2009;**45**:988–91.