

Hand-assisted Laparoscopic Partial Nephrectomy Combined with Caliceal Ureterostomy for the Treatment of Post-traumatic Ureteropelvic Junction Disruption

Ching-Hwa Yang^{1*}, Kuo-Hsin Chen²

Divisions of¹Urology and ²General Surgery, Department of Surgery, Far Eastern Memorial Hospital, Taipei, Taiwan, R.O.C.

Ureteropelvic junction (UPJ) disruption seldom occurs in patients with blunt abdominal trauma. The diagnosis of UPJ disruption is delayed in more than 50% of patients, and it can lead to difficulty in further treatment or increase the risk of nephrectomy. We present a 25-year-old man who was found to have left UPJ disruption 2 months after blunt abdominal trauma and who was successfully treated by partial nephrectomy combined with caliceal ureterostomy under hand-assisted laparoscopy. We review the literature and discuss the possible images to help early diagnosis of UPJ disruption. As a reconstructive procedure, caliceal ureterostomy under hand-assisted laparoscopy can be an effective and facilitated option. [*J Chin Med Assoc* 2009;72(5):278–280]

Key Words: caliceal ureterostomy, hand-assisted laparoscopy, ureteropelvic junction (UPJ) disruption

Introduction

Blunt abdominal trauma is a rare cause of injury to the upper ureter and renal pelvis, but some types of pre-existing renal abnormality, such as congenital ureteropelvic junction (UPJ) obstruction, will predispose the kidney to serious injury even if just minor trauma has been sustained. Delay in diagnosis of UPJ disruption occurs in more than 50% of cases, which often leads to nephrectomy. We present a case who suffered from blunt abdominal trauma with grade IV left renal injury, who was found to have complete UPJ disruption and lower-pole infarction of the left kidney 2 months after injury. It was successfully corrected by hand-assisted laparoscopic partial nephrectomy combined with caliceal ureterostomy.

Case Report

A 25-year-old man sustained blunt abdominal trauma as a result of a motorcycle accident. He was sent to our

emergency department. On arrival, hypotension (blood pressure, 80/50 mmHg) was noted, but his vital signs became stable after blood transfusion. Abdominal computed tomography without contrast showed grade IV left renal injury with circumferential hematoma over the left perirenal space. The patient was discharged without adverse events after conservative treatment by observation for 2 weeks. During this period, 1,000 mL of whole blood was given.

At follow-up, new-onset hypertension (150/90 mmHg) was noted. Abdominal echo showed left hydronephrosis, and intravenous pyelography revealed nonvisualization of left urogram. He was then admitted for further study.

On admission, left retrograde pyelography (Figure 1A) showed complete obstruction at the upper third of the ureter, and left antegrade pyelography (Figure 1B) revealed complete obstruction at the UPJ (intrarenal pelvis). Renal scan (with lasix diuretic study) showed grade 3–4 chronic obstruction pattern in left nephrogram with 17% of total glomerular filtration rate (GFR).



*Correspondence to: Dr Ching-Hwa Yang, Division of Urology, Department of Surgery, Far Eastern Memorial Hospital, 21, Section 2, Nan-Ya South Road, Pan-Chiao, Taipei 220, Taiwan, R.O.C.
E-mail: uroy@mail.femh.org.tw • Received: June 19, 2008 • Accepted: November 21, 2008

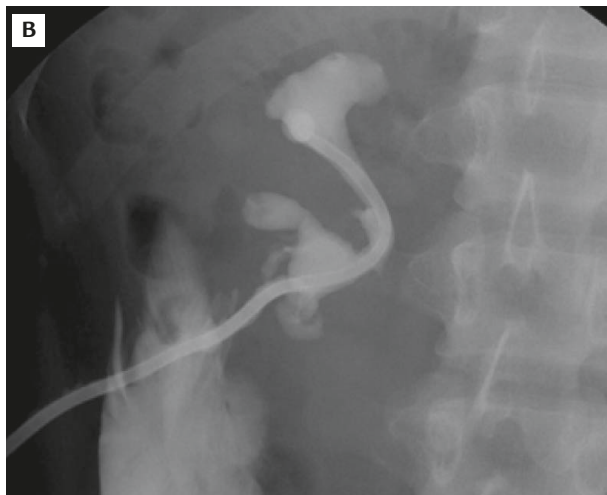


Figure 1. (A) Left retrograde pyelography shows complete obstruction over the upper third of the ureter. (B) Left antegrade pyelography shows intrarenal pelvis and nonvisualization of the ureter.

Renal angiography showed truncation of the lower segmental artery of the left kidney.

Under the impression of lower-pole infarction of the left kidney with complete traumatic UPJ disruption, the patient underwent hand-assisted laparoscopic left partial nephrectomy combined with caliceal ureterostomy. An incision (7 cm) was made in the midline supraumbilicus for the placement of a hand port. A 10-mm camera port was placed just lateral to the rectus muscle at the level of the hand port. A second 12-mm working port was placed approximately 2 finger breaths anterior to the tip of the twelfth rib. The left kidney was mobilized as much as possible by lysis of extensive perirenal fibrosis. Lower-pole partial nephrectomy was performed using a harmonic scalpel, removing



Figure 2. Follow-up excretory urography: patent excretion of left pyelogram.

as much tissue as necessary to identify the polar calyx. The left kidney was then delivered to near the wound of the hand-port, and anastomosis between the dilated calyx and spatulated end of the proximal ureter was made with a double J ureteral stent, which was removed 4 weeks after operation.

Excretory urography (Figure 2) done half a year later showed a satisfactory anatomic configuration. Follow-up renal scan revealed a mild increase in left renal function (from 17% of total GFR to 22% of total GFR).

Discussion

High-grade (grade IV or V) renal injuries sometimes result in poor outcome, such as delayed nephrectomy, hypertension, renal failure or diminished renal function,¹ but UPJ disruption is rare and diagnosed late in almost half of the reported cases.²⁻⁴ A high index of suspicion is needed to make the diagnosis; the constellation of renal contrast excretion with extravasation of contrast into the medial perirenal space with an intact calyceal system and nonvisualization of the unilateral ureter is virtually diagnostic of a complete or partial UPJ disruption.³⁻⁵ Delayed films are also necessary to visualize the collecting system with images done during the excretory phase.⁵ Nonvisualization of the ureter is an indirect sign of pelvis or ureteral injury, and retrograde ureterography can help to define the level of the lesion.⁶ Cases of partial truncation of the pelvis or ureter can be treated with stent placement.⁴ In cases with complete truncation of the ureter or pelvis, surgical intervention is mandatory, but

primary repair is often delayed due to associated severe injury or missed diagnosis.^{4,5} The surgical procedures include transureteroureterostomy, autotransplantation, end-to-end anastomosis and primary nephrectomy. Caliceal ureterostomy is usually done as a reconstructive procedure when confronting a small or intrarenal pelvis, a retracted ureter.⁷ By placing a hand-assisted device, mobilization of the injured kidney and partial nephrectomy can be done under laparoscopy; further anastomosis between the proximal spatulated ureter and lower calyx can also be made through the wound of the hand port without difficulty.

References

1. Knudson MM, Harrison PB, Hoyt DB, Shatz DV, Scott P, Zietlow, Jack M, et al. Outcome after major renovascular injuries: a western trauma association multicenter report. *J Trauma* 2000;49:1116-22.
2. Boone TB, Gilling PJ, Husmann DA. Ureteropelvic junction disruption following blunt abdominal trauma. *J Urol* 1993; 150:33.
3. Kawashima A, Sandler CM, Corriere JN Jr, Rodgers BM, Goldman SM. Ureteropelvic junction injuries secondary to blunt abdominal trauma. *Radiology* 1997;205:487-92.
4. Mulligan JM, Cagiannos I, Collins JP, Millward SF. Ureteropelvic junction disruption secondary to blunt trauma: excretory phase imaging (delayed films) should help prevent a missed diagnosis. *J Urol* 1998;159:67-70.
5. Powell MA, Nicholas JM, Davis JW. Blunt ureteropelvic junction disruption. *J Trauma* 1999;47:186-8.
6. Gomez AB, Verduch MM, Moragues FE, Ros RO, Ibarra FG. Rupture of the ureteropelvic junction by nonpenetrating trauma. *J Pediatr Surg* 1986;21:702-5.
7. de la Taille A, Houdelette P, Houlgatte A, Saporta F, Berlizot P, Lanfrey P. Ureteropelvic junction avulsion due to nonpenetrating abdominal trauma treated with caliceal ureterostomy. *J Urol* 1997;157:1840.