

Left Retrocaval Ureter Associated With Urothelial Malignancy

Presentation of a Rare Case

Diomidis Kozyrakis,¹ Ioannis Prombonas,¹ Vasilios Kyrikos,¹ Alkiviadis Grigorakis,¹ Georgios Pliotas,² Dimitrios Malovrouvas¹

¹Department of Urology,
"Evangelismos" General
Hospital of Athens, Athens,
Greece

²Department of Urology,
Western Attica Hospital,
Athens, Greece

Corresponding Author:

Diomidis Kozyrakis, MD
Sofokli Venizelou 77 St.,
Halandri, 15232, Athens,
Greece

Tel: +30 210 681 9942
Fax: +30 210 681 1795
E-mail: dkozyrakis@yahoo.
gr.

Received April 2010
Accepted October 2010

Keywords: ureter, embryology, vena cava, ureteral neoplasms

INTRODUCTION

The retrocaval ureter (RCU) is an unusual abnormality of the inferior vena cava (IVC) development and is usually diagnosed on the right side.^(1,2) The presence of a RCU on the left side is a very rare finding and has important clinical and surgical implications.⁽¹⁻⁴⁾

CASE REPORT

A 75-year-old man presented to the emergency ward with recurrent macroscopic hematuria and irritative voiding symptoms. In our diagnostic process, urinalysis, urine cytology, intravenous urography, and cystoscopy were employed.

A tumor in the bladder and another one in the distal ureter were diagnosed. Transurethral resection of the bladder tumor was initially performed and the pathology diagnosis was an at least pT2b urothelial tumor. Abdominal computed tomography was subsequently performed for tumor staging, which incidentally revealed a left IVC and a RCU ipsilaterally without situs inversus (Figure 1).

The urologic history of the patient started 5 years earlier when an urothelial pT1 grade IIB tumor of the bladder was diagnosed. The treatment included transurethral resection of the lesion followed by Bacille Calmette-Guérin (BCG) intravesical instillations. The upper urinary tract had been examined that time with ultra-



Figure 1. Computed tomography of the abdomen with administration of contrast agent. A left inferior vena cava (asterisk) and a retrocaval course of the left ureter (arrow) can be diagnosed.

sonography, which showed normal findings. Left nephroureterectomy and radical cystoprostatectomy were performed for the treatment of his urothelial malignancy. The nephroureterectomy was a laborious procedure, and accidentally, an opening to the IVC was made, which was immediately recognized and corrected (Figure 2). The radical cystoprostatectomy was uncomplicated. The frozen section of the right ureteral margin was positive for urothelial malignancy and right distal ureterectomy with ileal loop diversion was performed.

The postoperative recovery was uneventful. One and a half year after the operation, no signs of tumor recurrence, distant metastasis, or renal dysfunction were identified.

DISCUSSION

In cases of a retrocaval ureter, the subcardinal vein generates the IVC, which results in a course of the ureter dorsally to this vein. The term preureteral vena cava (PUVC) is preferable to the term RCU for the vascular origin of the abnormality to be emphasized.^(2,3) If the subcardinal vein persists at a left vena cava system, a left PUVC (LPUVC) is encountered.^(4,5) Reviewing the international litera-

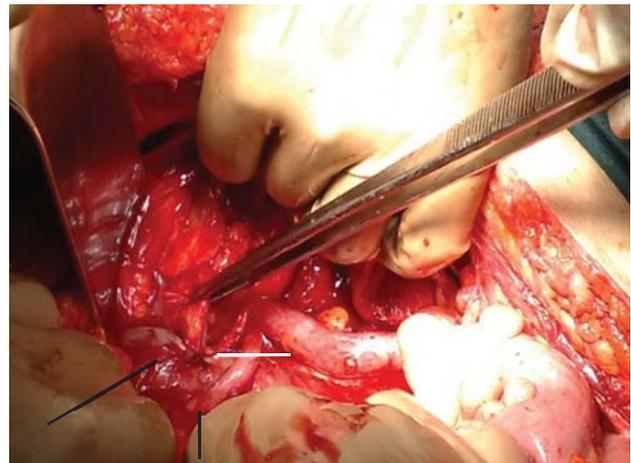


Figure 2. Abnormal course of the left ureter, dorsally to the left inferior vena cava. The proximal ureter is grasped with a forceps. The big black arrow shows the inferior vena cava, while the small black one indicates the course of the ureter dorsally to the vein. The opening on the inferior vena cava was corrected (white arrow).

ture, only 6 cases have been reported so far.⁽⁴⁻⁹⁾ Recurrent abdominal pain,⁽⁵⁾ lumbar pain,⁽⁴⁾ hydronephrosis,⁽⁸⁾ and nephrolithiasis⁽⁹⁾ are the presenting symptoms of LPUVC.

Traditionally, the combination of retrograde urography with cavography can identify the PUVC. The spiral computed tomography can substantially contribute towards the correct diagnosis.⁽⁴⁾ Should the use of intravenous radiopaque agents be contraindicated, magnetic resonance imaging can be performed instead.⁽³⁾

The left IVC and PUVC may be misdiagnosed as a retroperitoneal lymphadenopathy or a primary tumor of the retroperitoneal space.^(1,4) They also pose a threat for vascular or tissue damage during operations to the retroperitoneum, particularly when they are associated with situs inversus. The left renal vein has a brief course, which does not cross the aorta and subsequently, in cases of nephrectomy, living renal donor surgery, and reno-vascular surgery repair, it is difficult to be recognized and dissected from the surrounding tissues.⁽⁵⁾

The treatment of PUVC is ureterotomy and relocation of the ureter anteriorly to the IVC.^(2,3) This operation is usually an open surgical procedure, but nowadays it can be performed laparoscopi-

cally.⁽¹⁰⁾

Apart from hematuria, no other symptoms were described by our patient. Considering that his initial evaluation with ultrasonography five years earlier showed normal renal units and collecting systems bilaterally, it is estimated that the urothelial malignancy and not the LPUVC generated a clinical evident obstruction of the left urinary tract. To the best of our knowledge, this is the first case in which the PUVC is associated with urothelial malignancy.

Despite the pre-operative diagnosis, the left IVC and the abnormal ureteral course obscured the retroperitoneal structures. In our patient, an opening to the IVC was made. The surgeon must have a high index of suspicion and attention, and must be extremely meticulous during renal and ureteral dissection for any damage to the retroperitoneal organs to be avoided and a source of intra-operative complications to be prevented.

CONFLICT OF INTEREST

None declared.

REFERENCES

1. Bass JE, Redwine MD, Kramer LA, Huynh PT, Harris JH, Jr. Spectrum of congenital anomalies of the inferior vena cava: cross-sectional imaging findings. *Radiographics*. 2000;20:639-52.
2. Hyams BB, Schneiderman C, Mayman AB. Retrocaval ureter. *Can Med Assoc J*. 1968;98:45-9.
3. Pais VM, Strandhoy JW, Assimos DG. Pathophysiology of Urinary Tract Obstruction. In: Wein AJ, Kavoussi LR, Novick AC, Partin AW, Peters CA, eds. *Campbell-Walsh Urology*. Vol 2. 9 ed. Philadelphia: Saunders Elsevier; 2007:1195-226.
4. Rubinstein I, Cavalcanti AG, Canalini AF, Freitas MA, Accioly PM. Left retrocaval ureter associated with inferior vena caval duplication. *J Urol*. 1999;162:1373-4.
5. Pierro JA, Soleimanpour M, Bory JL. Left retrocaval ureter associated with left inferior vena cava. *AJR Am J Roentgenol*. 1990;155:545-6.
6. Brooks RE, Jr. Left retrocaval ureter associated with situs inversus. *J Urol*. 1962;88:484-7.
7. Ishitoya S, Arai Y, Waki K, Okubo K, Suzuki Y. Left retrocaval ureter associated with the Goldenhar syndrome (branchial arch syndrome). *J Urol*. 1997;158:572-3.
8. Watanabe M, Kawamura S, Nakada T, et al. Left preureteral vena cava (retrocaval or circumcaval ureter) associated with partial situs inversus. *J Urol*. 1991;145:1047-8.
9. Gramegna V, Madaro A, Pellegrini F, et al. A rare case of retrocaval ureter associated with persistent left vena cava. *Urol Int*. 2003;70:337-8.
10. Bagheri F, Pusztai C, Szanto A, et al. Laparoscopic repair of circumcaval ureter: one-year follow-up of three patients and literature review. *Urology*. 2009;74:148-53.