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Retrocaval Ureter: Report of 2 Different Clinical Spectrums

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ABSTRACT

Retrocaval ureter is a relatively rare anomaly where ureteric obstruction may occur as a result of ureter passes behind the inferior vena cava (IVC), hence, compressing it between the IVC and the vertebrae. We report 2 cases of retrocaval ureter with different presentations. One patient was managed surgically with minimally invasive approach and the other was managed conservatively.

Keywords: Retrocaval ureter, robotic surgery

INTRODUCTION

Retrocaval ureter is also known as circumcaval ureter and preureteral vena cava. This term is anatomically descriptive but is misleading in terms of embryologic development. It is a rare developmental anomaly of inferior vena cava, not the ureter. It is typically assumed that the right posterior cardinal vein fails to regress and persist as the renal segment of the IVC, hence, dragging the descending ureter medially.[1] This may lead to upper urinary tract obstruction. Surgical intervention is indicated in symptomatic patients or when the obstruction worsens and cause deterioration in renal function.

CASE REPORT

Case 1

A 15-year-old teenage boy presented with pyelonephritis and an ultrasound revealed right hydronephrosis. He was treated with intravenous antibiotics. Retrograde pyelogram was performed and a 6Fr (length of 24 cm) Cook ureteral stent was inserted. CT (computed tomography) scan revealed moderate right hyronephrosis and grossly dilated right upper ureter with no stones seen in the ureter. The right upper ureter lay posterior to the right inferior vena cava.

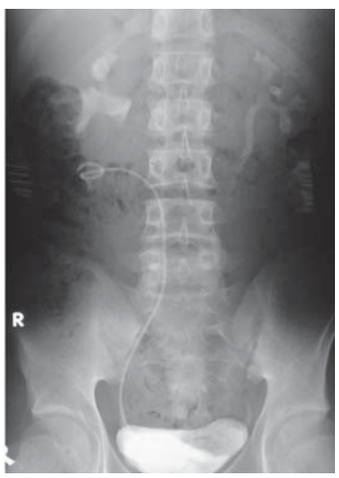

Figure 1. Retrograde pyelogram showed a typical S shape retrocaval ureter with the ureteric stent in situ.

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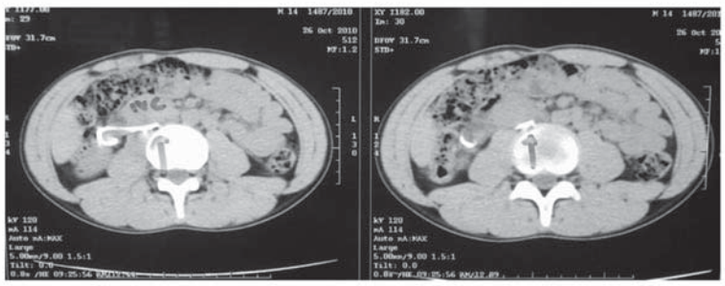

Figure 2. CT scan showing right ureter (with stent in situ) passing posteriorly to the IVC.

The patient was then referred to our centre for surgical correction for retrocaval ureter. Robotic assisted laparoscopic ureteroureterostomy was performed. He was put on left lateral position. Five laparoscopic ports were inserted. Four were placed along the midline, a 12 mm port at umbilicus as camera port, 2 ports (5 mm, 8mm- for robotic arm) above umbilicus and one (12 mm) at suprapubic area as working port. The last port (8 mm) was placed at the left iliac fossa for a second robotic arm. The ascending colon was mobilised and reflected medially. After its identification, the right ureter was divided just distal to the crossing of the IVC. Therefore, the ureter was repositioned to lie anterior to the IVC itself. Tension-free anastomosis with interrupted 4-0 absorbable sutures was performed with an intracorporeal suturing technique over double-J stent.

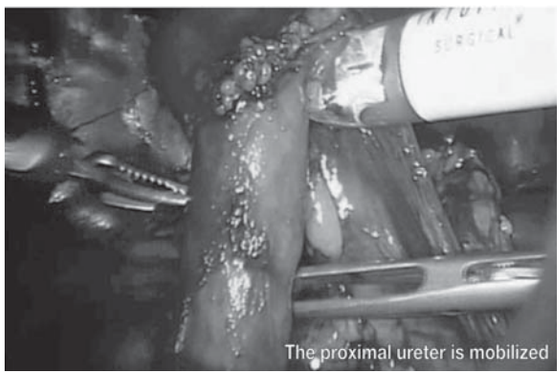

Figure 3. Intraoperative photograph of dilated right retrocaval ureter was mobilized, divided and repositioned to lie anterior to the IVC.

The patient had an uneventful post-operative course, with return of bowel function commencing on post-operative day one and discharge on post-operative day three. The drain and double-J stent were removed post-operatively, at 1 week and 6 weeks respectively. At the 6-mo follow-up visit, a DTPA scan revealed no evidence of obstruction of the right kidney. The patient remained symptom-free at the last follow-up.

Case 2

A 44-year-old man was diagnosed with an incidental finding of hydronephrotic right kidney when he had a routine ultrasound done in the clinic. His renal function was normal. Intravenous pyelogram (IVP) revealed moderate right hydronephrosis and hydroureter at the upper ureter till L3/L4 level with contrast hold up. The ureter distal to the dilated part was carried superiorly and medially to L3 till L5 pedicles and was of normal calibre. There were no filling defects noted along the urinary tract. Contrasted CT scan not only showed right ureter course postromedially looping around IVC, but also a double IVC course along both paravertebral regions.

Subsequently, we arranged for a DTPA (diethylenetriaminepentaacetic acid) scan with frusemide. It showed a hydronephrotic but non-obstructed right kidney with good function. We offered him conservative management. Ultrasound was repeated after 4 months and there was no worsening of the hydronephrosis.

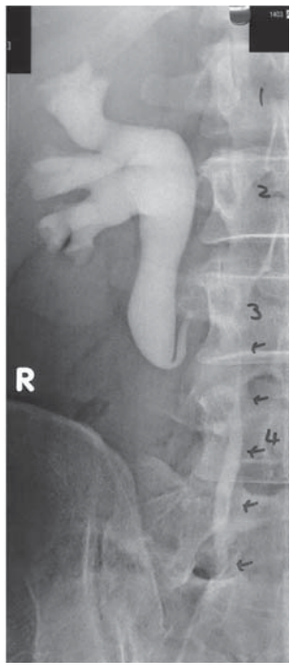

Figure 4. IVP showing moderate right hydronephrosis and hydroureter till L3 and abrupt tapering of the ureter calibre. Right ureter then ran a course medially to the vertebral pedicles.

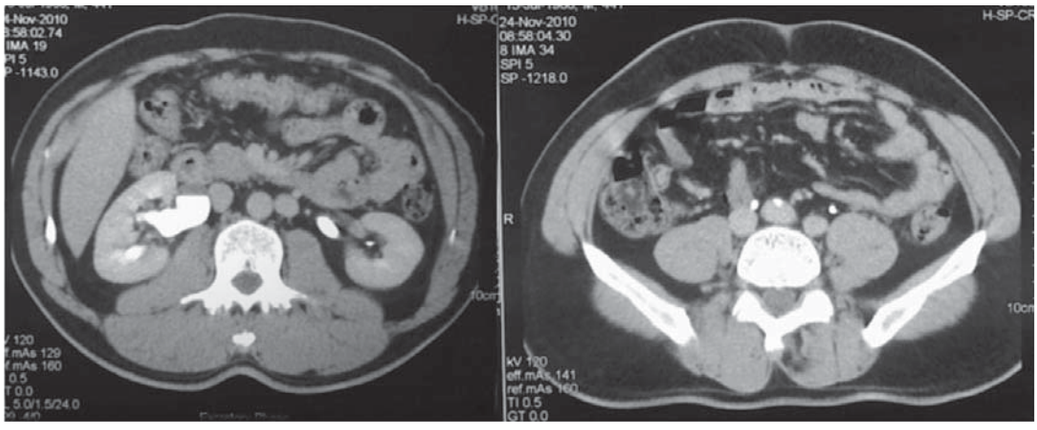

Figure 5. Contrast enhanced CT scans showing bilateral IVC and right ureter lying posteromedially to the IVC.

DISCUSSION

Retrocaval ureter was first reported and described by Hochstetter in 1893. Its incidence is reported as 1 in 1000 of the population. This anomaly occurs 3 times more commonly in the male population than in females.[2] It predominantly involves the right ureter as seen in both our patients.

Retrocaval ureter is generally classified into 2 clinical types. Type 1 (low loop) is more common and shows a typical S-shaped deformity of the ureter. The obstruction point is seen at some distance from the lateral margin of the IVC at L3 vertebrae. Type 1 is usually related to upper tract obstruction, while Type 2 (high loop) accounts for 10 percent and shows a "sickle-shaped" ureter. It is frequently not obstructed. The retrocaval segment lies almost at the same level of the renal pelvis.[3]

A majority of the patients remain asymptomatic until the third to fourth decade of life as a result of gradual development of hydronephrosis. Some may present early with flank pain, urinary tract infection or haematuria.

Diagnosis of retrocaval ureter is usually established by intravenous pyelogram (IVP) or retrograde pyelogram, showing typical medial deviation of the ureter with hydronephrosis. However, recently CT scan is considered the tool of choice for the diagnosis of such anomaly.[3] It is less invasive and would reveal the anatomy of IVC and ureter clearly. About 20 percent of retrocaval ureter co-exists with other congenital anomalies such as horseshoe kidneys, polycystic kidney and retroperitoeal fibrosis. Therefore, a CT scan allows us to detect them.[4]

Our first patient presented with complication of urinary obstruction, i.e. infection. This is one of the indications for surgical correction. Others include symptoms such as pain, obstructive uropathy and deteriorating kidney function of the affected kidney.[3] We performed a robotic assisted laparoscopic repair for him. We believed that this approach would cause less intra-operative bleeding and post-operative pain. Hence, his recovery would be faster and hospital stay will be shorter. Long operating hours due to intra-corporeal dissection and anastomosis is one of the limiting factors.[5] However, it was well tolerated in our patient as he is young. He recovered well and was discharged uneventfully.

On the other hand, the second patient was asymptomatic and diagnosis was made incidentally. Surgical correction was not mandatory for him. We arranged for a DTPA scan and it showed no evidence of functional obstruction. Hence, we did not offer him surgical correction. He will require a long-term follow up with periodic examination and investigations such as ultrasound and diuretic renogram.

With the intensive growth and development of minimally invasive surgery, robotic assisted laparoscopic repair would eventually replace the standard open surgery, while achieving similar therapeutic results. However, larger series are needed to provide adequate knowledge on a particular preferable surgical technique in the future.

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