Retrocaval ureter: a venous anomaly causing ureteric obstruction

B. Sathesan, A. P. I. Prabath and S. A. S. Goonewardena
Department of Urology, National Hospital of Sri Lanka, Colombo, Sri Lanka.

Abstract

Introduction The aim of this study is to report the experience in managing a rare entity, retrocaval ureter.

Patients and methods This is a retrospective study performed in a single urology unit of a tertiary referral center over a period of 8 years since October 2001. The diagnosis of retrocaval ureter was confirmed by retrograde ureteropyelogram. Symptomatic patients underwent open surgical pyelopyelostomy (ureteroureterostomy) after the ureter had been transposed to its normal anatomic position. Post surgical relief of ureteric obstruction was confirmed by 99mTc DTPA renogram.

Results There were 5 patients with retrocaval ureter. Mean age of the patients was 33 years (range 27-39 years). Out of 5 patients 4 were males. All 5 patients were presented with right flank pain and 3 of them had haematuria and a small mobile renal stone. All patients had type 1 right-sided retrocaval ureter. Associated anomalies were seen in none of the patients. All patients were asymptomatic after the surgical correction. Post operative 99mTc DTPA renograms were normal in all patients.

Conclusion Retrocaval ureter though rare can easily be diagnosed. Open surgical correction gives good results.
RETROCA VAL URETER: A VENOUS ANOMALY CAUSING URETERIC OBSTRUCTION

Figure 1. Intravenous urogram showing the classical S shaped or "fish-hook" deformity in retrocaval ureter.

Figure 2. Right retrograde ureteropyelogram showing retrocaval ureter.

Results (Table 1)

There were 5 patients with retrocaval ureter. The mean age of the patients was 33 years (range 27-39 years). Out of 5 patients 4 were males. All 5 patients presented with right flank pain and 3 of them had haematuria and a small mobile renal stone. All patients had type 1 right-sided retrocaval ureter. Associated anomalies were seen in none of the patients. All patients were asymptomatic after the surgical correction. Post operative 99mTc DTPA renogram was normal in all patients.

Table 1. Clinical, radiological and operative details of patients with retrocaval ureter

<table>
<thead>
<tr>
<th>Patient No</th>
<th>Age</th>
<th>Sex</th>
<th>Clinical Presentation</th>
<th>Diagnosis</th>
<th>Operation</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>33</td>
<td>Female</td>
<td>Right flank pain - 2 months</td>
<td>IVU, RUP</td>
<td>Pyelopyelostomy (ureteroureterostomy)</td>
<td>Asymptomatic, 99mTc DTPA renogram - non obstructed</td>
</tr>
<tr>
<td>2</td>
<td>27</td>
<td>Male</td>
<td>Right flank pain and haematuria - 2.5 months</td>
<td>IVU, RUP</td>
<td>Pyelopyelostomy (ureteroureterostomy)</td>
<td>Asymptomatic, 99mTc DTPA renogram - non obstructed</td>
</tr>
<tr>
<td>3</td>
<td>32</td>
<td>Male</td>
<td>Right flank pain and haematuria - 1.5 months</td>
<td>IVU, RUP</td>
<td>Pyelopyelostomy (ureteroureterostomy)</td>
<td>Asymptomatic, 99mTc DTPA renogram - non obstructed</td>
</tr>
<tr>
<td>4</td>
<td>31</td>
<td>Male</td>
<td>Right flank pain and haematuria - 1.5 months</td>
<td>IVU, RUP</td>
<td>Pyelopyelostomy (ureteroureterostomy)</td>
<td>Asymptomatic, 99mTc DTPA renogram - non obstructed</td>
</tr>
<tr>
<td>5</td>
<td>39</td>
<td>Male</td>
<td>Right flank pain - 1 year</td>
<td>IVU, RUP</td>
<td>Pyelopyelostomy (ureteroureterostomy)</td>
<td>Asymptomatic, 99mTc DTPA renogram - non obstructed</td>
</tr>
</tbody>
</table>

IVU - intravenous urogram, RUP - retrograde ureteropyelogram
Discussion

Retrocaval ureter is an uncommon congenital anomaly. Abnormal embryologic development of the inferior vena cava due to the failure of atrophy of the right subcardinal vein in the lumbar portion results in retrocaval ureter. The first recorded case of retrocaval ureter was seen on autopsy and was described by Hochstetter in 1893 (2). The incidence at autopsy is about 1 in 1500 (3). Retrocaval ureter is almost always right sided; however, in cases with situs inversus or duplication of the inferior vena cava, it may be seen on the left side (4,5).

The incidence of retrocaval ureter is higher in men than in women 4:1 (6), and most patients do not present with symptoms until the third or fourth decade of life (7). The symptoms depend on the degree of ureteric obstruction or the presence of complications. Intermittent flank pain is often noted as the first complaint. Occasionally, recurrent urinary tract infection, haematuria, pyelonephritis or stone formation is noted (8).

Bateson and Atkinson classified retrocaval ureter into two clinical types: [1] the more common type I has hydronephrosis and typically obstructed demonstrating some degree of fishhook-shaped deformity of the ureter at the level of the obstruction, and [2] type II has a less degree of obstruction or none at all. Here the upper ureter is not kinked but passes behind the vena cava at a higher level, with the renal pelvis and upper ureter lying almost horizontal before encircling the vena cava in a smooth curve (9).

In our study all patients had right sided type I retrocaval ureter; the mean age of patient at presentation was 33 years; male to female ratio was 4:1; all patients had loin pain as presenting symptom.

Associated anomalies with retrocaval ureter are reported up to 21% and are mainly related to the cardiovascular and urogenital systems. The associated anomalies include horseshoe kidney, contralateral renal hypoplasia or ectopia, Turner’s syndrome, Goldenhar syndrome, retroperitoneal fibrosis, polycystic disease of the kidneys, congenital lack of the vas deferens and hypospadias. None of these anomalies were documented in our patients.

Retrocaval ureter has been previously diagnosed by intravenous urography and retrograde pyelography, but nowadays, CT scan is the best modality for diagnosis (10). MRI can nicely demonstrate the course of a retrocaval ureter and may be more detailed when compared with CT or retrograde uretero-pyelogram (11). Nuclear diuretic renogram can categorize the anomaly as obstructed or nonobstructed. In our patients the diagnosis was made by both intravenous urography and retrograde ureteropyelography.

Procedural intervention is indicated in the presence of functionally significant obstruction leading to pain or other complications. The standard repair of retrocaval ureter is open surgical pyelopyelostomy or ureteroureterostomy. Pure laparoscopic repair of the retrocaval ureter has been performed both transperitoneally and retroperitoneally (12,13). Pure robotic retrocaval ureter repair is feasible. Apart from the ergonomic and technical benefits that the robotic approach gives to the surgeon, there does not appear to be any other advantage over the laparoscopy (14). All of our patients were asymptomatic and obstruction free at 3 or 4 months after open surgical pyelopyelostomy (ureteroureterostomy).

References


Authors

Balasubramaniam Sathesan, MBBS (Jaffna), MS (Col)*

A. P. I. Prabath, MBBS (Ruhuna), MS (Col)*

*Senior Registrar in Urology

S. A. S. Goonewardena, MS (Col), FRCS (Eng), DUrol (Lond)
Consultant Urological Surgeon

Department of Urology, National Hospital of Sri Lanka, Colombo, Sri Lanka.