Retrocaval Ureter: An Unusual Cause of Hydronephrosis in an Adult

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Introduction
Retrocaval ureter is an uncommon anomaly in which the right ureter courses posterior to the inferior vena cava and partially encircles it. Retrocaval ureter results from persistence of the posterior cardinal venous system that anomalously forms the inferior vena cava and subsequently courses anterior to the ureter for a variable distance. This can cause a varying degrees of ureteral obstruction and hydronephrosis1-3.

Case Report
Clinical presentation
A 62-year old man was referred to urology clinic from a prostate awareness campaign. He complaint of incomplete voiding and dribbling for the past 5 years. On clinical examination, prostate was mildly enlarged. Blood investigations were unremarkable. He was diagnosed and treated as benign prostatic hypertrophy.

Imaging findings
1. Ultrasound of the abdomen showed
   - Mild enlargement of the prostate
   - Dilated right pelviccalyceal system. The proximal right ureter was also dilated and can be traced up to its midlevel. Lower part of the right ureter was not dilated.
   - Left lower pole renal calculus with no obstructive uropathy.
2. CT urography (Figure 1 and 2) showed
   - Right hydronephrosis and right hydronead
   - No calculus identified within both kidneys or the ureters.
3. Intravenous urography (IVU) showed right hydronephrosis and hydronephrosis with medial displacement of right ureter at its middle level (Figure 3).
   The appearance was highly suggestive of a retrocaval ureter.

Management
Based on ultrasound and CT findings, cystoscopy examination (CE) with right ureteric stenting was performed. The right ureter proximal to the kink was dilated. Ureteral orifice was normal. The right ureter was not demonstrated (no contrast within) due to contrast pooling in the dilated right renal pelvis (red arrow). Haematuria was noted. The right ureter proximal to the kink was dilated and located as compared to normal location of left ureter (red arrow).

Conclusion
Retrocaval ureter is a rare cause of hydronephrosis in an adult patient. Its rarity and non-specific presentation can be a challenge to radiologists and surgeons in making accurate diagnosis for a successful surgical intervention. Changing practice pattern had seen CTU replacing IVU in urological assessment of hydronephrosis, mostly were due to calculate. However, IVU remains an appropriate examination for the evaluation of certain congenital anomalies causing the hydronephrosis as demonstrated in our case.

Discussion
Retrocaval ureter is an unusual cause of hydronephrosis1-3. It showed 2 to 3 folds male predominance. Most of the cases are asymptomatic1-2. There are two types based on radiographic criteria4.

<table>
<thead>
<tr>
<th>Obstruction site</th>
<th>Appearance on IVU or RPG</th>
<th>Type 1 (low level)</th>
<th>Type 2 (high level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyeloureteral segment</td>
<td>Fish-hook or reversed 'J' with medial deviation of middle/lower ureter</td>
<td>More common</td>
<td>Less common</td>
</tr>
<tr>
<td>Sickle shaped renal pelvis</td>
<td>Mild</td>
<td></td>
<td></td>
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</tbody>
</table>

The intravenous urography is usually diagnostic. CT scan may miss the diagnosis without strong clinical suspicion and without correlation with other imaging. However, CT scan is good to exclude retroperitoneal fibrosis and a retroperitoneal mass as a cause of medial deviation of the ureter. Recent reported cases showed MRI to be as good and has the benefit of no radiation risk3,5.

Conservative management is indicated to those with mild hydronephrosis without obvious symptoms, infection, worsening renal function or stone formation. Unilateral retrocaval anatomy anterior to vena cava with resection of the retrocaval segment is the favoured surgical option with reported good outcome6,7.

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References