Article published online: 2022-07-07

Case Report

Retrocaval Ureter-Classic Imaging Appearance

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Abstract

The appearance of (reverse "J" or "fishhook") of the classic type of retrocaval ureter on intravenous urogram and computed tomographic urography are presented in this report. It is an uncommon cause of urinary tract obstruction and every clinician, radiologist, and the surgeon must be familiar with its imaging appearances.

Keywords: Intravenous urogram, retrocaval ureter, urinary tract obstruction

Introduction

Retrocaval ureter is an uncommon cause of obstructive uropathy with the ureter passing behind the inferior vena cava leading to sharp turn which results in retrograde obstruction and consequent ureterohydronephrosis. Retrocaval ureter is not a developmental anomaly of the ureter, but it is due to maldevelopment of the inferior vena cava (IVC) being placed anteriorly makes it looks as if the ureter is anomalous. Hence, it is also sometimes known as "preureteric cava".[1] It is best diagnosed by computed tomographic (CT) urography, but it can also be diagnosed on intravenous urographic (IVU) images.

Case Report

A 31-year-old male patient presented to the surgical observation unit of our institution with complaints of colicky right lumbar pain for the past few hours which had become constant over this period. There was associated history of burning sensation on micturition. Clinical examination revealed tender right lumbar region with no palpable mass. The complete blood count and hemogram profile were as normal. Ultrasonography (US) of the abdomen revealed moderate hydronephrosis and moderate dilatation of the right upper ureter with no calculus demonstrated on the US. IVU radiograph was obtained which revealed the right ureterohydronephrosis, but distal ureter was not visualized. The contrast excretion was seen at 15 min [Figure 1]. Subsequently, CT urography was performed using Somatom Sensation 64 slice (Siemens Healthcare, Germany) which revealed moderate dilatation of the right upper ureter with moderate hydronephrosis. The delayed (15 min scan) revealed the typical retrocaval course of the right ureter which had resulted in the hydroureteronephrosis [Figures 2 and 3]. The functioning of both the kidneys was normal. The left kidney did not show any signs of obstruction. CT also ruled out the extrinsic causes of ureteral compression and most importantly ureteric stone. Multiple reformations were used to delineate the course of the right ureter. The patient was managed by open laparotomy with resection and uretero-uretric reanastomosis, and the outcome was very good.

Discussion

Retrocaval ureter, a relatively uncommon cause of obstructed uropathy was first described by in 1892 by Ferdinand Hochstetter.[2] It has predominant male preponderance. Flank pain and urinary tract infection are the most common modes of presentation in patients with retrocaval ureter. IVU is the first-line investigation performed in these cases. Although not diagnostic, the appearance is typical on IVU [Figure 1]. These days multidetector CT is increasingly used for the diagnosis of

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Quick Response Code:

Website: www.ijmbs.org

DOI: 10.4103/ijmbs.ijmbs_54_17

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How to cite this article: Ilyas M, Ellahi I, Shafi F, Rafiq S, Choh N. Retrocaval ureter-classic imaging appearance. Ibnosina J Med Biomed Sci 2018;10:25-7.

Figure 1: Delayed (15 min) intravenous urogram radiograph in a case of retrocaval ureter showing moderate right hydroureteronephrosis with abrupt change of ureteric caliber and course of the right ureter. The distal ureter is not visualized

Figure 3: Coronal reformatted computed tomographic image (a) and volume rendered images (b and c) showing the complete course of the right retrocaval ureter (typical "fish hook appearance") with proximal hydroureteronephrosis

retrocaval ureter because it has high sensitivity in ruling out other causes of ureteral obstruction such as retroperitoneal

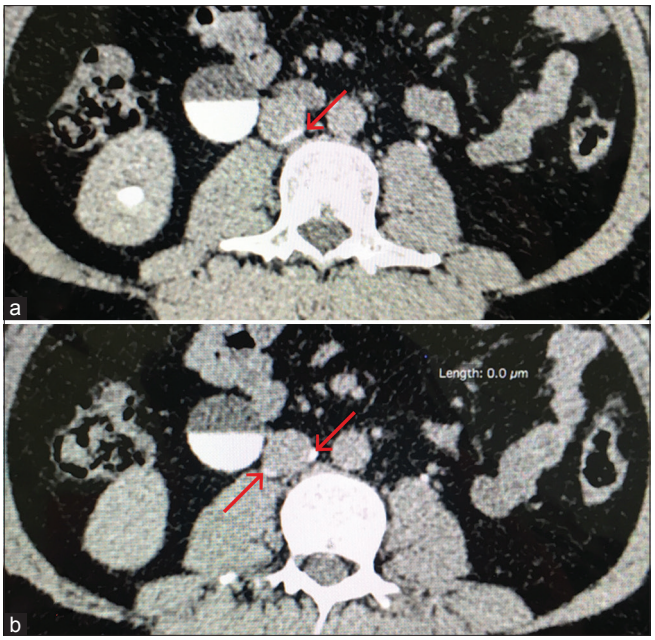

Figure 2: Axial contrast-enhanced computed tomographic urographic images showing right ureter passing posterior to inferior vena cava with dilated proximal ureter (arrows in a and b)

fibrosis and extrinsic compression.[3,4] The axial images show the typical retrocaval course of ureter with proximal hydronephrosis and abrupt tapering of the ureter at the site of course modification [Figure 2]. Postprocessed coronal reformations of delayed urogram phase of CT urography reveal the typical "inverted J" or "fish-hook" appearance of the ureter [Figure 3]. Besides being diagnostic, CT urography also helps in evaluation of the renal function.

MR urography using T2-weighted sequences is used for diagnosing retrocaval ureter in cases of deranged kidney functions; pregnant women and children; and in patients with allergy to CT contrast. The factors not in favor of MR urography include more time consumption, cost, patients with metallic implants, and claustrophobic patients. In the present case, the function of the kidney had not deteriorated yet. Although open surgical exploration is being commonly used for treatment, there are reports of repair of retrocaval ureter using laparoscopic procedures.[5,6] The present case was managed by open surgical exploration with resection and uretero-ureteric anastomosis.

Conclusions

Retrocaval though being a congenital anomaly, clinically presents in the mid-adulthood of life. It is an uncommon cause of obstructive uropathy. CT urography is the best technique to evaluate the suspected cases of retrocaval ureter as it allows simultaneous evaluation of other possible causes and assessing the function of the kidney. The classic type has a typical "inverted J" or "fish-hook" appearance on delayed CT urographic images.

Declaration of patient consent

The authors certify that they have obtained the appropriate patient consent form. In the form the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity.

Author's contribution

All authors participated in the patient care and preparation, revision and approval of the case report.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Compliance with ethical principles

No prior Institutional Review Board approval is required for single cases reports. Informed consent was obtained. Patient anonymity is maintained in all the study images.

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