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Imaging of anatomical variations of the ureters- A pictorial essay

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The ureter exhibits a wide range of anatomical variations, which significantly affect surgical and urological interventions. Imaging plays a crucial role in diagnosing these conditions early. This pictorial essay aims to provide image findings of selected cases encountered within six months from 01.01.2023 conducted at Leesons Hospital, Ragama.

Case 01-Pelvic-ureteric junction (PUJ) obstruction-A 36-year-old female was investigated for abdominal distension. An ultrasound scan-abdomen (USS-A) showed a large cystic mass on the left abdomen. CT-kidney, ureter, and bladder (CT-KUB) showed gross dilatation of the left renal pelvic calyceal system and the absence of dilated ureter, suggesting complete PUJ obstruction.

Case 02-Bilateral kinked ureter-A 30-year-old female was investigated for urolithiasis. CT-intravenous urogram (CT-IVU) demonstrated grade-I ureteric kinking in the right uppermost ureter and grade-II ureteric kinking in the left uppermost ureter at the level of the PUJ.

Case 03-Duplex ureter-A 39-year-old woman with urolithiasis underwent CT-IVU, revealing right-sided hydronephrosis and hydroureter caused by a lower ureteral stricture. Additionally, it revealed a left-sided duplex kidney with long partial duplex ureters merging at the S3/S4 vertebral level and continuing as a single ureter.

Case 04-Retrocaval ureter-A 49-year-old man presented with right-sided abdominal pain. USS-A revealed hydronephrosis and proximal hydroureter on the right side. CT-IVU and 3-D reconstruction also showed hydronephrosis and proximal hydroureter. The ureter beyond the hydroureteric segment took an upward and posterior course behind the inferior vena cava (IVC), then looped medially between the IVC and the aorta, resembling a "fishhook ureter." The rest of the ureter appeared normal and connected to the bladder.

Anatomical variations of the ureters are initially detected in ultrasonography and confirmed by CT KUB or CT-IVU with 3-D image reconstruction. Understanding these variations and CT findings is crucial for effective patient management and surgical interventions.

Keywords: pelvic-ureteric junction obstruction, kinked ureter, duplex ureter, fishhook ureter

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