



Radio-Diagnosis

A PICTORIAL REVIEW OF IMAGING FEATURES OF VARIOUS CONGENITAL URINARY TRACT ANOMALIES BY MDCT UROGRAPHY

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ABSTRACT **BACKGROUND:** Congenital anomalies of the kidney and urinary tract can be the cause of adult-onset renal failure that currently have no specified cause, knowing the imaging findings permit optimal patient management and thorough workup (1). CT urography provide good anatomic detail and diagnostic specificity in evaluating congenital anomalies of urinary tract (2). **OBJECTIVE:** To illustrate imaging features of various types congenital anomalies of the urinary tract by MDCT Urography pictorially. **MATERIALS AND METHODS:** A prospective study done in the department of Radiology and Imaging, Vinayaka Mission's Medical College and Hospital, Karaikal. Patients from adult age groups including men and women who came for MDCT Urography study for clinical work up of various clinical symptoms and diseases with imaging features of congenital anomalies are included in study and evaluated. **RESULTS:** A total of 6 patients with imaging features of congenital urinary tract anomalies noted and evaluated. Horseshoe kidney has been observed in two patients, duplex collecting system was seen in five patients, bifid collecting system in two patients, ureterocele in one patient. **CONCLUSION:** Despite advances in medical care and antenatal imaging many congenital anomalies of urinary tract still remain an important health problem many anomalies are undetected until patients present with various urinary tract related symptoms or evaluated other medical conditions. This review highlights the most common congenital anomalies of urinary tract that are encountered during MDCT urography examination.

KEYWORDS : MDCT Urography, common congenital anomalies of urinary tract.

INTRODUCTION

Congenital anomalies of the kidney and urinary tract can be the cause of adult-onset renal failure that currently have no specified cause, knowing the imaging findings permit optimal patient management and thorough workup (1). CT urography provide good anatomic detail and diagnostic specificity in evaluating congenital anomalies of urinary tract (2).

OBJECTIVE

To illustrate imaging features of various types congenital anomalies of the urinary tract by MDCT Urography pictorially.

MATERIALS AND METHODS

A prospective study done in the department of Radiology and Imaging, Vinayaka Mission's Medical College and Hospital, Karaikal. Patients from adult age groups including men and women who came for MDCT Urography study for clinical work up of various clinical symptoms and diseases with imaging features of congenital anomalies are included in study and evaluated.

RESULTS

A total of 6 patients with imaging features of congenital urinary tract anomalies noted and evaluated. Horseshoe kidney has been observed in two patients, duplex collecting system was seen in four patients, bifid collecting system in one patient, ureterocele in one patient.

Horseshoe Kidney

It is the most common congenital fusion anomaly of kidney occurs in 1 in 400-600 individuals. It is associated with other anatomic anomalies and complications. Incidentally detected or present with complications. CECT is the modality of choice, to evaluate anatomic and other surrounding structures. Orientation of kidney, collecting system and vessels are abnormal. U or inverted U-shaped kidney in midline fusion. L shaped in lateral fusion type. It important to note medially directed lower pole of the kidney to suspect horseshoe kidney. Moiety can be vertical or horizontal. Isthmus lies anterior to aorta and IVC usually but can be seen posterior or between vessels also. Isthmus gets blood supply from aorta and its branches. Evaluate for PUJ obstruction, renal stone, infection, tumors and trauma which may be seen in these patients (3).

Duplex Collecting System

Two separate pyelocaliceal systems can be complete or incomplete. It is a common anomaly, can be asymptomatic or symptomatic can be associated with obstructive uropathy, ureterocele, vesicoureteral reflux and incontinence. Seen in females more than males. Incidence and prevalence reported to be 0.7% to 4% of population. According to Weigert-Meyer Upper moiety inserts in ectopic location, inferior and

medial to orthotopic UV junction. CT is not the primary modality to image but it provides excellent resolution to delineate complex anatomy. Expiratory phase is ideal for ureter evaluation Imaging features include different renal size, cleft in renal parenchyma, dilation of upper and lower pole collecting systems, double ureters. Nuclear scans, MRU are used more frequently in children (4). Complications includes VU reflux, ectopic insertion of ureter, ureterocele, mal development of UV valve.



Figure 1. Horseshoe kidney: 45-year-old man presented with pain abdomen, Axial corticomedullary phase show fusion of lower poles of kidneys across the midline anterior to aorta and IVC.

Bifid ureter

Bifurcation of ureter can occur anywhere along the ureter. Ureter inserts before draining at orifice. It is incomplete duplication of collecting system.

It is nicely depicted during the expiratory phase of CT urography examination. Volume rendered images can be obtained to improve the confidence in diagnosis. Complication of one ureter can affect the other ureter also (4).

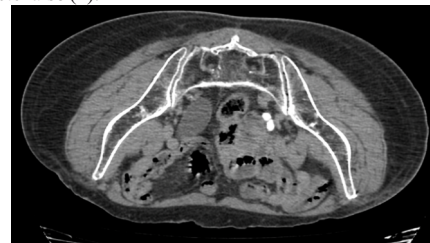


Figure 2. 78-year-old man, axial excretory phase image in prone position, show bifid ureter on right side.

Ureterocele

It is a cystic dilation of lower end or intravesical segment of ureter. Ureterocele can be seen in single collecting system. When diagnosed it is important to look for associated anomalies. Though CT is not ideal modality to diagnose. Classified into orthotopic ureterocele seen commonly in adults and ectopic ureterocele seen in children with other duplex collecting abnormalities. Imaging feature in MDCT urography are intravesical cystic structure continuous with ureter filled with contrast in excretory and delayed phases (5).



Figure 3. 78-year-old man, axial delayed phase image shows bilateral ureterocele.

CONCLUSIONS

Despite advances in medical care and antenatal imaging many congenital anomalies of urinary tract still remain an important health problem many anomalies are undetected until patients present with various urinary tract related symptoms or evaluated for other medical conditions. Imaging plays an important role in diagnosis of congenital anomalies of urinary tract. This review highlights the most common congenital anomalies of urinary tract that are encountered during MDCT urography examination.

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