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Original Article

64 MS-CTU: Review of techniques and spectrum of the ureteric diseases

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ABSTRACT

Objective: The study aims to clarify the sensitivity of the CTU, and if is it coast effective and time effective to be used as first and the one-stop shop imaging modality for the diagnosis of the different ureteric diseases.

Patients and methods: 400 patients with different urinary tract complaints (hematuria and/or renal colic) did triphasic CTU examinations, for diagnosis of suspected obstructive or traumatic ureteric uropathy from January 2014 to October 2016. These patients were filtered from a larger number of patients – who were presented with urinary tract complaints by plain KUB X ray and US, which showed no explaining kidneys or urinary bladder pathology.

Results: Ureteric duplication was detected in 5 (1.25%) patients, ectopic ureter in one patient (0.25%), UPJ stricture in 4 patients (1%), PUJ vascular impression in 2 patients (0.5%), ureteric calculus in 103 patients (25.75%), pyogenic ureteritis in 8 patients (2%), ureteritis cystica in one patient (0.25%) TCC in 3 patients (0.75%), PRPF in one patient (0.025%) and Trauma in one patient (0.025%).

Conclusion: CTU is very sensitive tool of imaging and could be confidently considered the one-stop shop imaging tool for accurate diagnosis of the different ureteric lesions.

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1. Introduction

The ureter is responsible for a considerable share of the urinary tract complaints, which are renal colic or pain, hematuria and impaired renal functions. Being retroperitoneal in position, of thin caliber and long course; it is not always easy to diagnose ureteric lesions, by conventional imaging methods like plain KUB, US or even IVP. So, it is not uncommon to miss some ureteric lesions at its early presentation, which will be definitely reflected upon the outcome and prognosis of such disease. Also, its small caliber makes it possible for small ureteric lesions to completely obstruct its lumen causing obstructive nephropathy, with resultant impaired renal function.[1]

Anatomically, the ureter is a long thin duct which connects urine from the kidney to the urinary bladder. Proximally, it arises from the renal pelvis at the pelviureteric junction (PUJ) and ends distally into the urinary bladder at the vesicoureteric junction (VUJ) (Fig. 1). It leads a complete retroperitoneal course, having around 25 cm length, with less than 3 mm caliber width. Histologically, it is lines with a layer of urothelium surrounded by a smooth muscle layer that allows peristaltic contractions. So, it may be normally not thoroughly opacified at CTU, as there may be some contracted non opacified segments at the time of the scan. However, the absence of an obstructive cause and lack of proximal dilatation is the clue to consider it a physiological not pathological phenomenon.[2]

After advent of the multislic CT scan, CTU had been increasingly requested during the last decade as the first urinary tract imaging modality. With the continuously developing MSCT scan advances of CT urography, it is crucial for radiologists to be acquainted with the normal ureteral anatomy and the different ureteral pathologies. These pathologic findings at CT urography include congenital abnormalities, urolithiasis, inflammations, neoplastic lesions and

Abbreviations: AGH, Al-Mana General Hospital; CTU, computed tomography of the urinary tract; ESWL, extracorporeal shock wave lithotripsy; HIV, human immune-deficiency virus; HU, Hounsfield unit; IVU, intravenous urography; MSCT, multislic CT scan; PRPF, primary retroperitoneal fibrosis; PUJ, pelviureteric junction; RTA, road traffic accidents; TCC, transitional cell carcinoma; UT, urinary tract; VUJ, vesicoureteric junction; VUR, vesicoureteric reflux.

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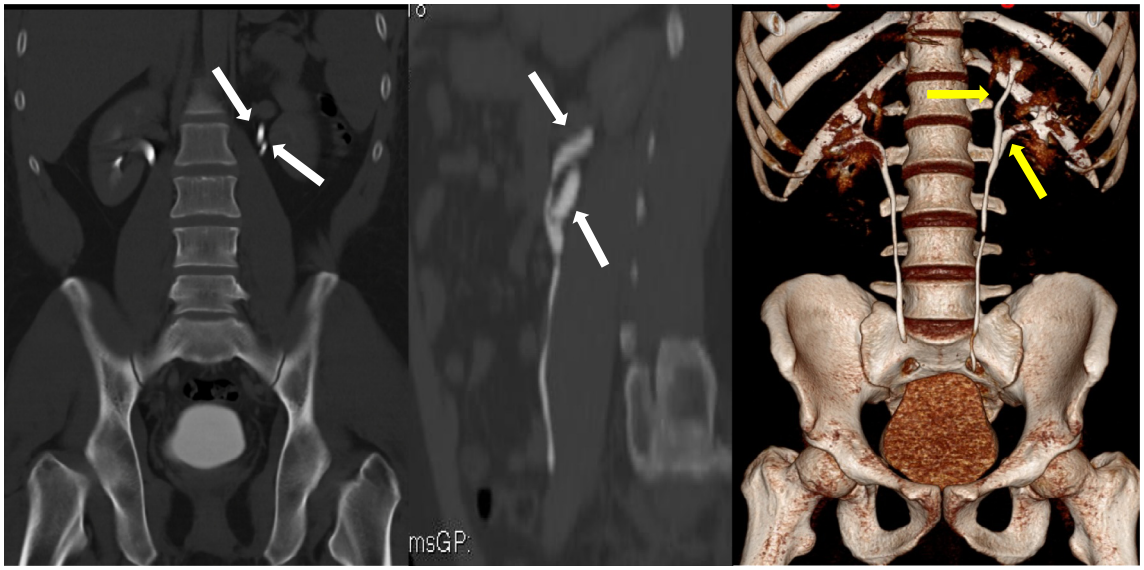


A B C

Fig. 1. (A) CRF, (B) SRF& (C) VR CTU showing: Left short segmental upper ureteric duplication (Arrows).

Table 1
Results of CTU examinations.

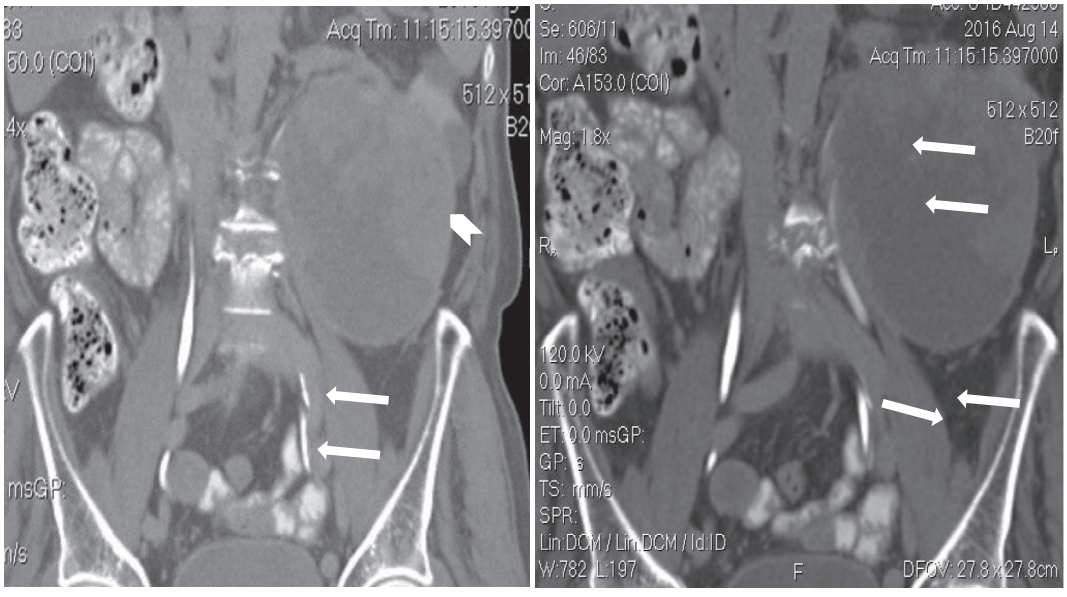
Diagnosis	No. of patients	Percentage (%)
Ureteric duplication	5	1.25
Ectopic ureter	1	0.25
PUJ stricture	4	1
PUJ vascular impression	2	0.5
Ureteric calculus	103	25.75
Pyogenic ureteritis	8	2
Ureteritis cystica	1	0.25
TCC	3	0.75
PRPF	1	0.025
Trauma	1	0.025

PUJ: pelviureteric junction, TCC: Transitional cell carcinoma, PRPF: Primary retroperitoneal fibrosis.

course abnormalities. As any imaging technique, it has sensitivity and specificity scores as well as some advances and some limitations. Also, many technical points are important to be issued in attempt to get perfect study with no technical errors.[3,4]

2. Aim of the study

The study aims to clarify the sensitivity of the CTU for diagnosis of different ureteric diseases and if is it coast effective and time effective to be used as first UT imaging modality for different clinically suspected ureteric diseases.



A B

Fig. 2. (A and B) CTU CRF excretory phase in another patient with longer duplication ureteric segments (Arrows); medially displaced by large left renal Bosniak IVcystic neoplastic lesion (Chevron).

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