INTRODUCTION

Hematuria is common and can originate from any site in the urinary tract. The presence of gross hematuria usually prompts patients to seek medical attention, and a thorough urologic investigation is warranted to determine its cause. Urologic evaluation for hematuria should involve a thorough examination of the upper and lower urinary tract. Optimal, comprehensive upper tract imaging studies should allow detection of renal cell carcinoma, transitional cell carcinoma, urolithiasis, and renal infection ***(Kawashima et al, 2004).***

The main causes of hematuria are urinary tract calculi, renal tumors, urothelial tumors, and infection. Multidetector CT urography (MDCTU) is the best single imaging examination for diagnosing all of these pathologies. It has been shown to detect parenchymal masses in the kidney with high sensitivity rather than other modalities (***Janet et al, 2006).***

CT has evolved from single–detector row scanners into multi–detector row helical volumetric acquisition techniques, and these advances have had a significant impact on imaging of the urinary tract. Application of multi–detector row CT for evaluation of the urinary tract has been termed *CT urography*. CT urography is attractive since both the renal parenchyma and urothelium can be evaluated with a single comprehensive examination. This primary use of CT urography potentially also allows shortening the overall duration of the patient's schedule for diagnostic evaluation. In some medical centers, CT urography is becoming the definitive study for patients with hematuria ***(Newhouse et al, 2001)***

Multidetector CT urography (MDCTU) offers several advantages for imaging of the urinary tract: single breath-hold coverage of the entire urinary tract with absence of respiratory mis-registration, rapid imaging with optimum contrast medium opacification and reduced partial-volume effect as appropriate slices can be selected from the volumetric data. In addition, acquisition of multiple thin overlapping slices provides excellent two-dimensional (2D) and three-dimensional (3D) reformations, and facilitates virtual cystoscopy. These advantages have established MDCTU as a compelling alternative to excretory urography and ultrasonography (US) in the evaluation of the patient with hematuria ***(Michael et al, 2004).***

Indeed in many academic medical centers, MDCTU has replaced excretory urography as the "core" imaging study for investigation of hematuria. MDCTU has the potential to stand alone as a comprehensive "one-stop" test for imaging the upper and lower urinary tract. It is especially suitable for patients presenting with hematuria where the urinary tract must be assessed for both stone disease and neoplasms of the kidney and/or urothelium ***(Michael et al, 2004).***

CT urography can be performed with combination of unenhanced, nephrographic-phase, and excretory-phase imaging. The unenhanced images are ideal for detecting urinary calculi. Renal masses are detected and characterized with combination of unenhanced and nephrographic-phase imaging .The excretory-phase images provide evaluation of the urothelial tract ***(Caoili et al, 2003)***