INTRODUCTION

Urinary obstruction with hydronephrosis is a common outcome of many urologic diseases. A wide variety of pathological processes, intrinsic and extrinsic to the urinary system, can cause urinary obstruction. Calculi, neoplasms, infection, co-agulopathy , inflammatory and fibrotic processes are important pathologies. Most acute obstructive uropathies are associated with significant pain that alerts the clinician to the need for appropriate diagnostic work-up and treatment. However, chronic urinary obstruction often requires a high index of suspicion, which prompts an appropriate imaging modality that may confirm or rule out the presence of obstruction. **(Kemper J and Nolte-Ernsting C., 2005)**

Many imaging modalities have been used to evaluate patients with urinary obstruction. Historically, intravenous urography (IVU) has been the primary method of imaging in these patients. Currently, the examinations that are commonly used to evaluate patients with urinary obstruction include IVU, ultrasonography (US), computed tomography (CT), magnetic resonance (MR) imaging, retrograde ureterography and pyelography, cystoscopy, and ureteroscopy. **(Kemper J and Nolte-Ernsting C., 2005)**

Evaluation of patients with urinary obstruction frequently requires several imaging modalities. Each offers its specific advantages. **(Kemper J and Nolte-Ernsting C., 2005)**

Ultrasonography and conventional intravenous urography are most common methods in diagnosis of obstructive uropathies .The disadvantage of Ultrasonography is inability of visualizing middle and lower one third of ureter ,while intravenous urography is using

radiation ,also functionally extra loading effect on kidneys. (**karabacakoglu et al., 2004).**

Both CT urography (CTU) and MR urography (MRU) have evolved into important diagnostic tools in modern uroradiology . **(Kemper J and Nolte-Ernsting C., 2005)**

Non-enhanced helical computed tomography (NCECT) has become the primary imaging modality for evaluating acute flank pain and suspected renal stone disease. The high sensitivity (97%) and specificity (96%) of helical CT for depicting genitourinary calculi has been established , and CT is of particular value for detecting ureteral calculi, which often are not visualized with other imaging modalities. With the increased use of CT, Sonography (US) and intravenous pyelography have begun to play a secondary role in the evaluation of genitourinary calculi. Nonetheless, US continues to be performed in the setting of acute flank pain or nephrolithiasis for the detection of calculi in the renal pelvis and parenchyma. US is also performed to identify fragmented renal calculi after extracorporeal shock-wave lithotripsy (ESWL). The sensitivity of US for detecting renal calculi has been reported to be as high as 96% compared with that of abdominal radiography and conventional tomography . **(Smith RC et al., 1996)**

Magnetic resonance urography (MRU) has the potential to provide anatomical and functional information about a possible obstructed urinary tract without nephrotoxic contrast media or radiation exposure **(Nolte-Ernsting C et al., 2003)** . The classic MR- urographic technique utilizes

unenhanced, heavily T2-weighted turbo spin-echo sequences for

obtaining static fluid images of the upper urinary tract independent of the excretory renal function. T2- weighted MR urograms have proved to be excellent in visualizing the dilated urinary tract, even in non-excreting kidneys have shown to be rapid , safe, and non invasive imaging technique that can reliably reveal hydronephrosis . **(Kemper J and Nolte-Ernsting C., 2005)**

In addition, T1-weighted MRU reflects the excretory renal function and displays the urine flow within the upper urinary tract after renal excretion of gadolinium chelate. Fast T1-weighted 3D gradient echo sequences provide impressive urograms of both non-dilated and obstructed collecting systems. **(Kemper J and Nolte-Ernsting C, 2005)**

In patients with normal and moderately impaired renal function. Using these advantages, MRU has the potential to be a valuable diagnostic tool in the assessment of obstructive uropathy especially in pediatric or post renal transplant settings. **(Kemper J and Nolte-Ernsting C, 2005)**

MRU is a valuable and well tolerated investigation for evaluating painful hydronephrosis in pregnancy. There are characteristic and differing urographic appearances in physiological and calculous obstruction. **(Spencer et al., 2004).**

MR urography can accurately and non-invasively detect the presence and level of obstruction and can be used for patients who have adverse reaction to contrast agents, renal failure, during pregnancy, in childhood

and when excretory urography failed to opacity the urinary tract . **(El-Diastey et al., 2005).**

The low dose Gd-DTPA enhanced MR urography (MRU) sequence was the best overall sequence for the visualisation of both the pelvicalyceal systems and ureters. **(Hughes et al., 2002**).

Gadolinium-enhanced excretory MR urography provides both functional information and detailed morphologic information of the detailed urinary tract. **(Blandino et al., 2002).**

MRU could differentiate acute from chronic urinary tract obstruction. The presence of perirenal and periureteric edema distinguished clearly cases of acute obstruction. **(Leyendecker JR and Gianini JW ., 2009)**

Previous studies have shown that dynamic contrast-enhanced MR urography has several advantages in the evaluation of hydronephrosis because it combines both anatomic and functional information in a single test that does not use ionizing radiation. The purpose is to review our experience with MR urography in patients with PUJ obstruction and to identify anatomic or functional parameters that may predict which patients will benefit from surgery. (**Zielonko et al., 2003).**