RADIOLOGICAL IMAGING IN THE DIAGNOSIS OF MAJOR UROLOGICAL DISEASES

Karimov Zafar Berdimurodovich

Samarkand State Medical University, Republic of Uzbekistan, Samarkand

Abstract:

Radiological imaging plays a central role in the diagnosis and management of major urological diseases, enabling early detection, accurate characterization, and effective treatment planning. The most common urological conditions, including urolithiasis, renal tumors, prostate cancer, and obstructive uropathies, require a multimodal imaging approach for optimal evaluation.

Urolithiasis remains one of the most prevalent urological disorders worldwide. Non-contrast computed tomography (NCCT) is considered the gold standard for detecting urinary tract stones due to its high sensitivity and specificity. It allows precise determination of stone size, density, and location, which are essential for selecting appropriate treatment strategies.

Renal tumors represent another critical area where imaging is indispensable. Ultrasound is often used as an initial screening method; however, contrast-enhanced CT and magnetic resonance imaging (MRI) are required for accurate lesion characterization. These modalities help differentiate between benign and malignant masses, assess tumor vascularity, and determine the extent of local invasion and metastasis.

Prostate cancer is one of the leading malignancies in men, and multiparametric MRI (mpMRI) has become a key diagnostic tool in its detection and staging. mpMRI improves the identification of clinically significant tumors, guides biopsy procedures, and supports risk stratification, thereby reducing unnecessary interventions.

Obstructive uropathies, including hydronephrosis and ureteral strictures, are effectively evaluated using ultrasound and CT urography. Imaging enables visualization of the level and cause of obstruction, which is crucial for timely intervention and prevention of renal function deterioration.

The integration of various imaging modalities provides a comprehensive assessment of urological diseases, enhances diagnostic accuracy, and supports personalized treatment planning. In addition, emerging technologies such as artificial intelligence and radiomics are expected to further improve the diagnostic capabilities of radiology in urology.

Conclusion:
Radiological imaging is essential in the management of major urological diseases, offering significant advantages in early diagnosis, disease characterization, and treatment optimization.

Keywords: urology, radiology, urolithiasis, renal tumors, prostate cancer, obstructive uropathy, MRI, CT

References:

1. Smith R.C., Rosenfield A.T., Choe K.A.. Acute flank pain: comparison of non-contrast CT and intravenous urography. // Radiology. — 1995. — Vol. 194. — P. 789–794.
2. Türkbey B., Choyke P.L.. Multiparametric MRI of prostate cancer: an update. // American Journal of Roentgenology. — 2019. — Vol. 213(5). — P. 1103–1113.
3. Silverman S.G., Pedrosa I.. CT and MRI evaluation of renal masses. // Radiologic Clinics of North America. — 2018. — Vol. 56(4). — P. 585–601.

cyberlininka.ru