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Advanced imaging techniques in genitourinary cancers

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This issue of Urologic oncology is devoted to advanced imaging techniques in genitourinary cancers, a topic currently enjoying a Renaissance. Over the past 2 decades, conventional techniques such as sonography, computed tomography (CT), and anatomic magnetic resonance imaging (MRI) have been used with widely acknowledged limitations. Recently, however, multiparametric MRI (mpMRI), molecular imaging, and positron emission tomography (PET) have increasingly been utilized to better diagnose, stage, and follow-up patients with genitourinary cancers.

In this issue, these new ideas for imaging of bladder, kidney, prostate, and testicular cancers are presented in detail. For bladder cancer imaging, Rais-Bahrami et al. discuss new imaging techniques for the diagnosis of non-muscle-invasive and muscle-invasive bladder cancer along with their local and nodal staging building on the experience of established modalities. An important point raised by the authors was lack of clinical trials designed around the implementation of functional imaging during neoadjuvant treatment. They propose that future studies could attempt to standardize approach to neoadjuvant treatment tailoring and follow-up by first assessing response to therapy midcycle with mpMRI vs. conventional CT in all patients undergoing chemotherapy. Those patients showing no obvious tumor response could then undergo midcycle transurethral resection of bladder tumor. If imaging was correct in showing no response then those patients could immediately move on to radical cystectomy instead of additional chemotherapy.

For prostate cancer imaging, Marko et al. explain novel (mpMRI and PET/CT) imaging techniques and how they compare these techniques with conventional imaging. The broad influence of new imaging methods on the multiple states of prostate cancer, ranging from local low-risk disease to metastatic disease, is discussed. The uses of mpMRI in prostate cancer are widely discussed and among the mentioned indications are lesion detection, active surveillance, local staging, preprocedural planning, and biochemical recurrence evaluation, which is recently a hot topic. Additionally, this article presents a large menu of both clinically used as well as research PET tracers for targeted imaging of prostate cancer.

For renal cell carcinoma imaging, Sankineni et al. discuss new and old modalities including CT, ultrasound, MRI as well as molecularly targeted imaging. The article covers sonography and CT findings of renal cell carcinomas; moreover the MRI section discusses the multiparametric approach along with novel pulse sequences such as arterial spin labeling and dynamic contrast-enhanced MRI. Finally, for germ cell tumor imaging, Secil et al. cover the pathologic and imaging findings with several case samples and recent innovations in staging.

We would like to gratefully acknowledge the time and dedication of these authors, as well as the diligent support and assistance from the series Editor, Dr. Scott Tagawa. The reader would be well-rewarded for investing time in reading comprehensive material presented in this issue of Urologic Oncology.

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