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Editorial

Multiparametric MRI in Urology

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Multiparametric MRI (mpMRI) is a specialized MRI scan that combines multiple imaging techniques to create a more detailed picture of an organ than a standard MRI. It evaluates both the anatomy and function of the organ by using different sequences, such as T2-weighted images, Diffusion-Weighted Imaging (DWI), and dynamic Contrast-Enhanced (DCE) imaging. This is particularly useful in diagnosing and managing conditions like prostate cancer by providing information about the tumor's size, location, and characteristics. So mpMRI may serve as a noninvasive diagnostic tool for aggressive malignancies [1]. MPMRI-derived physiological biomarkers and radiomic features are important in bladder cancer clinical applications. It may offer a significant advantage for staging and grading. Clinical studies and trials may benefit from new artificial intelligence methods, improving the patient's quality of life [2]. In bladder cancer, the aim is to standardize mpMRI interpretation. An expert panel developed the Vesical Imaging–Reporting and Data System (VI-RADS). Many studies confirm the standardization and high degree of inter-reader agreement to discriminate muscle invasiveness in bladder cancer, supporting VI-RADS implementation in routine clinical practice [3]. The current development of AI tools for analyzing mpMRI data and their potential impact on bladder imaging are surveyed. The use of mpMRI and AI is projected to drive the field toward the personalized management of bladder cancer patients [3]. The distinction between non-muscle-invasive bladder cancer and muscle-invasive bladder cancer is important for the selection of the optimal treatment. Multiparametric MRI (mp-MRI) has been a useful modality for the T staging of bladder cancer, and a systematic evaluation of mp-MRI is needed. The Vesical Imaging Reporting and Data System was designed to standardize the scanning and reporting criteria based on mp-MRI for clinical and research applications [4].

Compared to practices that do not use each biomarker in men with newly diagnosed prostate cancer, urology practices using mpMRI, and tissue-based genomics to a lesser extent, are more likely to treat men at very high risk of dying from competing risks of mortality within 10 years of prostate cancer diagnosis [5]. At present, there is no standardized system for scoring the appearance of the prostate on multiparametric magnetic resonance imaging (MRI) after focal ablation for localized prostate cancer. A novel scoring system was proposed, the Prostate Imaging after Focal Ablation (PI-FAB) score, to fill this gap. PI-FAB involves a 3-point scale for rating MRI sequences in sequential order: (1) dynamic contrast-enhanced sequences; (2) diffusion-weighted imaging, split into assessment of the high-b-value sequence first and then the apparent diffusion coefficient map; and (3) T2-weighted imaging. It is essential that the pretreatment scan is also available to help with this assessment. It was designed that PI-FAB using present experience of reading post-ablation scans over the past 15 years and includes details for representative patients initially treated with high intensity focus ultrasound to demonstrate the scoring system. PI-FAB was proposed as a standardized method for evaluating prostate MRI scans after treatment with focal ablation. The next step is to evaluate its performance across multiple experienced readers of MRI after focal therapy in a clinical data set. A proposed scoring system called PI-FAB is to be used to assess the appearance of magnetic resonance imaging scans of the prostate after focal treatment for localized prostate cancer [6].

To conclude, Multiparametric MRI helps clinicians in deciding on further management.

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