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Should We Perform Multiparametric Magnetic Resonance Imaging of the Bladder Before Transurethral Resection of Bladder? Time to Reconsider the Rules

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We would like to congratulate Ueno and colleagues [1] on their paper on diagnostic accuracy and interobserver agreement for the new Vesical Imaging-Reporting and Data System (VI-RADS) [2] for muscle-invasive bladder cancer (MIBC) in this issue of *European Urology*. Their report on 74 patients who underwent multiparametric magnetic resonance imaging (mpMRI) before transurethral resection of bladder tumor (TURBT) raises great interest in the RADS (Reporting and Data Systems) era. They address the questions of reproducibility and diagnostic performance of mpMRI in the setting of bladder ca (BC), in which potential applications of this imaging technique have seen constant growth in the past decades without a definitive role having been identified.

The cohort the authors used in their study comprised 37 patients with MIBC and 37 with non-muscle-invasive BC (NMIBC). They all underwent a VI-RADS-compliant mpMRI protocol, including T2-weighted sequences, diffusion-weighted imaging (DWI) sequences, and dynamic contrast-enhanced (DCE) imaging. Five genitourinary radiologists independently analyzed the target lesions identified by a study coordinator and assigned a likelihood of bladder muscle invasion primarily on the basis of the tumor appearance on T2-weighted images and a final score according to DWI and DCE images. In terms of interobserver agreement, there was high reproducibility among the five readers, with an intraclass correlation coefficient of

0.85. The pooled area under the receiver operating characteristic curve was 0.90, which confirms the great potential of mpMRI as a diagnostic tool for BC.

Ueno et al. [1] shed light on contemporary mpMRI for bladder applications by validating the recently proposed reporting system. mpMRI assessment of BC is not new to radiology: the first reports demonstrating its ability to correctly stage local disease date back to the 1990s [3]. In the past, further improvements in MRI techniques and namely the implementation of functional techniques such as DWI and DCE into the traditional T1- and T2-based protocol, have legitimized its use in differentiating MIBC from NMIBC [4]. In this regard, the description of the "tumor stalk" semiotics by Takeuchi et al. [5] can undoubtedly be considered a milestone. More recently, two meta-analyses [6,7] calculated pooled sensitivity of 87% and 92% and specificity of 79% and 87%, respectively, in distinguishing between MIBC and NMIBC, corroborating the maturity of mpMRI for adoption in clinical practice.

However, according the European Association of Urology guidelines [8], the diagnosis and local staging of BC rely on cystoscopy and histological evaluation of bladder tissue. Imaging techniques such as computed tomography and MRI are mainly reserved for lymph node and distant disease staging, with the important caveat that neither technique can be used to assess the primary tumor stage. It is well known that guidelines lag behind the best current clinical

practice; nonetheless, it appears that the need for improvement in BC management is not getting the attention it deserves. The current standard for diagnosis and local staging of BC is TURBT, an invasive procedure that carries a risk of bladder perforation and, perhaps more importantly, a significant risk of understaging that might delay radical treatment [9,10]. In addition, there is great variability in the quality of TURBT and pathologists might disagree on BC grading and staging. Thus, integration of imaging in the local staging of BC is to be welcomed if it can improve overall accuracy.

Despite the undeniable advances in mpMRI of the bladder, there has been a lack of standardization in terms of protocol and reporting. The aim of the promoters of the VI-RADS was to bridge this gap, and the work by Ueno et al. [1] comes at the perfect time. Their results suggest that mpMRI of the bladder can be a valuable tool for men with BC. Urologists should be confident with the information provided by mpMRI as it can appropriately determine the depth and range for excision sites, lowering the risk of bladder perforation with a concomitant increase in diagnostic accuracy. Furthermore, the proportion of false negative examinations (ie, the number of MIBCs assigned to the low-probability categories) is on the safe side, as they found only four MIBCs out of 33 category 1 and 2 tumors. These data are in accordance with a recent single-center validation of VI-RADS [11], which also found a low proportion of false negatives (5–10%, depending on the reader) in a similar cohort.

So should we perform mpMRI before TURBT in all patients with BC? It is likely that the road ahead for a new paradigm that incorporates mpMRI into the initial workup for these patients is still long, but there is no reason to slow down. The evidence available at present is clearly insufficient to justify the routine use of mpMRI before performing TURBT. Larger, multicentre and possibly randomized trials are needed to demonstrate definitively the advantages of mpMRI implementation. In addition, the presence of a learning curve for radiologists must be taken into account: both of the aforementioned studies have a "privileged" setting involving dedicated radiologists at an academic centre or a study coordinator who chose the target lesions, which limits their applicability.

The time is favorable for standardizing and extending the use of mpMRI of the bladder, and above all for making urologists aware that they may have a new tool for accurate diagnosis and staging of BC. Finally, there is no reason to limit mpMRI to an adjunct tool before TURBT, as several authors have suggested its use in assessing bladder tumor before and after immunotherapy prior to radical cystectomy [12]. A new era for bladder imaging has already started, we just need to keep pace.

Conflicts of interest: The authors have nothing to disclose.

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