Letter to the Editor

Vesical Imaging-Reporting and Data System (VI-RADS) incorporated into bladder cancer clinical practice: what's the perspectives beyond diagnostic accuracy?

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In this issue of *Translational Andrology and Urology*, Wong and colleagues (1) summarize the available data regarding the newly introduced Vesical Imaging-Reporting and Data System (VI-RADS). The aim of this scoring system is to standardize bladder multiparametric magnetic resonance imaging (mpMRI) for clinical and research purposes. In particular, the original concept was developed to create a systematic approach to reporting bladder MRI and defining the risk of muscle invasion in bladder cancer [e.g., non-muscle invasive (NMIBC) versus muscle invasive (MIBC)] (2).

From its first clinical validation for diagnostic performance in MIBC detection by Barchetti *et al.* (3), further reports have been published in a relatively short range of time suggesting active clinical interest in this MRI-based scoring system (4,5). Moreover, two recent meta-analysis have reported a cumulative area under the receiver operating characteristic curve (AUC) of 0.94 (95% CI, 0.91–0.95) and 0.93 (95% CI, 0.91–0.95) suggesting high reliability for the primary outcome of differentiating NMIBC from MIBC (6,7). While all these data are promising, they should be considered preliminary in absence of a multicenter prospective trial in order to consolidate the role of VI-RADS prior to transurethral resection of bladder tumor (TURBT).

Nevertheless, looking back at the historical course of a similar scoring system, PI-RADS (Prostate Imaging-Reporting and Data system) for prostate cancer (PCa) (8), there may be more potential applications than pre-operative differentiation in clinical stage. Indeed, MRI is now being used for serial monitoring of disease progression in patients during active surveillance (AS) for low-risk PCa, to guide focal therapy, and to plan surgery in high-risk disease.

When looking at the possible clinical applications of VI-RADS, our group explored the utility of it for identifying understaged patients among patients that are candidates for secondary resection (Re-TURBT) (9). A recent meta-analysis has questioned the clinical usefulness of Re-TURBT, reporting an overall insignificant impact of procedure on each single survival outcome (RFS, PFS, CSS, and OS) with regard of T1 NMIBC (10). VI-RADS in this setting may therefore help in accurate pre-TURBT identification of those patients who could avoid secondary resection as they are low risk for being understaged (e.g., VI-RADS score 1-2, unifocal, small tumors) versus those that are high risk (e.g., VI-RADS 4-5, diagnosed with Ta-T1 at initial TURBT).

Additionally, although still preliminary, VI-RADS is under evaluation as an alternative to replace deep TURBT resection to stage BCa. The "Bladder Path" trial (https://www.birmingham.ac.uk/research/crctu/trials/Bladder-Path/index.aspx) is testing the hypothesis as to whether TURBT can be substituted by mpMRI for addressing patients directly to radical interventions. If the preliminary results of such experience are promising, this could represent a paradigm shift

in the algorithm of bladder cancer treatment incorporating mpMRI as a key feature the initial hematuria work-up.

Already proven in a post-hoc analysis from the PURE-01 trial (11), the role of mpMRI for assessment of pathological complete response (CR; pT0) after neoadjuvant pembrolizumab demonstrated to be reliable in predicting this critical prognostic outcome, thus offering a radiation-free alternative to the current CT-based guidelines to asses patient's response to treatment. However, this experience was limited to the sole use of neoadjuvant systemic immunotherapy and each mpMRI sequence consisted of a dichotomous variable (yes *vs.* no) which is limiting as treatment response is a spectrum. VI-RADS could represent the consequent evolution of such approach, potentially reflecting a on a 5-point scale, different degree of radiologic response therefore becoming an imaging biomarker in the context of NAC. This may finally allow for personalizing of a patient's therapeutic options rather than proceeding to cystectomy after NAC as is currently standard.

A last proof of VI-RADS versatility is from the recent proposal to adapt these criteria in the context of the COVID-19 pandemic as a risk-adapted decision-making tool for minimizing patient's risk exposure to viral infection and thus providing a prognostic criterion for adjusting oncologic class priority among overwhelmed waiting lists (12).

In conclusion, VI-RADS has potential for staging bladder cancer, but further prospective, large multi-institutional collaborations are mandatory before wide-spread adoption for local staging differentiation and also, ideally, within nomograms for predicting patient's outcome.

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