Editorial comment on “Natural history of prostate cancer on active surveillance: stratification by MRI using the PRECISE recommendations in a UK cohort”

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Due to the natural history of prostate cancer as a slow-growing disease, Active Surveillance has been proposed as an alternative strategy for certain patients. Men with low-risk and low-volume intermediate-risk prostate cancer have many different competing risk factors for survival especially in higher age groups. Several studies with large patient cohorts have demonstrated the feasibility and safety of Active Surveillance [1]. A significant number of patients can defer or prevent definitive treatment without missing the window of curability for those who eventually progress. Historically, the mainstay of disease monitoring in Active Surveillance were regular PSA tests, digital rectal exams (DRE), and annual prostate biopsies. Imaging was not a major part of Active Surveillance protocols and was limited to transrectal ultrasound (TRUS), which was merely used to obtain systematic transrectal biopsies of the prostate. In recent years, multiparametric prostate MRI showed improved detection of clinically significant prostate cancer in prospective clinical studies and consequentially was recommended by many prostate cancer guidelines [2]. Recently, some groups are proposing multiparametric MRI as an additional monitoring tool for Active Surveillance patients. However, its exact role in Active Surveillance is still a matter of debate due to the scarcity of data. Some studies show that multiparametric prostate MRI in conjunction with targeted biopsies reclassifies patients initially considered eligible for Active Surveillance in up to one third of cases [3]. These patients were upgraded to higher-grade Gleason scores and did not meet Active Surveillance criteria anymore. Thus, this technique can help limiting the number of patients to those

most likely to remain on Active Surveillance while identifying those patients in need for definitive treatment earlier. A more novel approach is the use of serial MRI scans in addition to PSA testing, DRE, and prostate biopsies. This strategy is not well investigated and remains controversial up to the present. Many critics argue that current protocols already have proofed to be safe and effective in long-term follow-up and adding serial MRI scans would not add any additional benefits. Proponents argue that serial MRI scanning could improve the safety of Active Surveillance even further by better patient selection, earlier detection of disease progression, and reduction of biopsy procedures [4]. In addition, inclusion criteria for Active Surveillance could be further extended to more patients with intermediate disease. However, most experts agree prostate biopsies during Active Surveillance cannot be replaced by MRI due to its significant false-negative rate. Nevertheless, before the exact role of serial MRI scans during Active Surveillance can be defined, reporting standards are necessary to define prostate cancer progression on multiparametric prostate MRI scans. The Prostate Cancer Radiological Estimation of Change in Sequential Evaluation (PRECISE) criteria are such an effort and are based on a consensus statement by a distinguished international panel of experts in the field of multiparametric MRI and Active Surveillance [5]. A 5-tier Likert scale is proposed to assess radiologic progression on MRI. This system mainly relies on size changes of index lesions, visibility on diffusion-weighted MRI, and the appearance of high-risk imaging features like extraprostatic extension or seminal vesicle invasion. However, it is solely based on expert opinion and clinical validation is necessary to assess its practical merits and reproducibility.

The current publication is an important step towards this goal and presents the results of a retrospective study validating the PRECISE system in a single-center Active Surveillance patient cohort. A total of 553 patients with low or intermediate prostate cancer, who opted for Active Surveillance and at least two serial MRI scans, were included in this study. A subset of

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306 patients had at least one confirmation biopsy during follow-up. The majority of patients (80%) had Gleason 3+3 at study entry. Primary outcome was the correlation between PRECISE category and clinical progression defined as either histological progression to Gleason grade group ≥ 3 or initiation of active treatment. PRECISE categories 4 and 5 showed significantly higher progression rates than categories 1–3 rendering it a potential new predictor of disease progression in Active Surveillance patients. In a further analysis, PRECISE also correlated with PI-RADS categories at study entry and PSA density. A multivariable cox regression analysis was not available to evaluate whether PRECISE categories remain an independent predictor compared to other predictors of disease progression.

This study represents a real-world scenario with all related advantages and disadvantages. Different scanner types and biopsy techniques were used reflecting the huge diversity that can exist even within a single institution. The PRECISE categories were assigned retrospectively by a single experienced genitourinary radiologist. Thus, no conclusions regarding reproducibility and inter-reader variability can be drawn. Follow-up biopsies were performed based on serum PSA, MRI findings, or individual criteria. To further assess the practical value of the PRECISE criteria, prospective studies are needed with regular per-protocol follow-up biopsies. PRECISE categories should be tested in a multivariable analysis with other clinical to rule out multicollinearity with other predictors and assess its independent predictive value. In addition, multi-reader studies including radiologists with different experience levels are needed to evaluate reproducibility

and inter-reader variability. In conclusion, this study is an important step towards the validation of the PRECISE system in a contemporary Active Surveillance cohort with serial prostate MRI scans. Prospective studies are needed to address current limitations and evaluate the independent predictive value of PRECISE categories compared to standard clinical predictors.

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