

LETTER TO THE EDITOR

Micro-ultrasound may significantly reduce the proportion of unnecessary prostate biopsies in patients with PI-RADS 3 lesions

We read with great interest the recent report by Fang et al.¹

The authors investigated the use of clinical factors in predicting clinically significant prostate cancer (csPCa) in men with equivocal lesions on multiparametric magnetic resonance imaging (mpMRI). More specifically, the article focuses on individuals with Prostate Imaging-Reporting and Data System (PI-RADS) 3 lesions on mpMRI and discusses the role of targeted and systematic biopsies in this patient category.

The authors found that a predictive model including the prostate-specific antigen density, age, and biopsy history could prevent 25% of PI-RADS 3 biopsies while missing approximately 5% of csPCa cases. Interestingly, the authors reported that an anterior lesion location represented an important predictor of cancer in PI-RADS 3 lesions but did not significantly improve the overall performance of their model.

This multi-institutional analysis was based on clinical predictors of prostate cancer and did not implement new biomarkers or alternative imaging modalities for patient risk stratification.

However, we believe that alternatives should be considered to improve the clinical decision-making process in these equivocal cases and therefore minimize the need for unnecessary prostate biopsies.

Micro-ultrasound (micro-US) is an ultrasound-based imaging modality operating at a high frequency (29 MHz).²

Although level 1 evidence is still awaited,³ we have recently demonstrated in a single-institution, prospective study that micro-US could represent an effective tool for the early detection of csPCa with a diagnostic performance similar to that of mpMRI.⁴ These findings have also been confirmed by meta-analyses.^{5,6}

More recently, Ghai et al.⁷ have also confirmed the role of micro-US in the diagnosis of csPCa in a single-center, prospective trial of biopsy-naïve individuals.

In light of these promising preliminary findings, the European Association of Urology has recently approved the use of micro-US for the diagnosis of prostate cancer in its guidelines.⁸ The main advantage of this approach is real-time identification of suspicious lesions; this potentially makes ultrasound/magnetic resonance imaging fusion procedures easier, and additional targets that may have been missed by mpMRI may be found.⁹

Because of this evidence, the role of micro-US in the sub-stratification of csPCa risk in PI-RADS 3 lesions probably deserves

future investigation. In September 2017, we started a prospective study aiming to compare the accuracy of micro-US and mpMRI in the diagnosis of csPCa (Protocol ICH 003 v1.0, which was approved on September 27, 2017 [Study 2004]).

Our preliminary results showed that using micro-US as an additional test for determining whether or not to biopsy patients with PI-RADS 3 lesions would result in 100% detection of csPCa while reducing the detection of insignificant prostate cancer by 23.8%. Additionally, among patients without a corresponding visible lesion on micro-US, there were no cases harboring csPCa. Overall, 27% of the patients could have avoided a prostate biopsy; therefore, the potential morbidities of this invasive procedure could be limited in a nonnegligible proportion of individuals.¹⁰


In patients with PI-RADS 3 lesions on mpMRI, micro-US could play a central role in urological decision-making; it represents a useful tool for avoiding unnecessary prostate biopsies and ruling out the presence of csPCa. Further studies are warranted to evaluate the effectiveness of micro-US in this specific setting.

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CONFLICTS OF INTEREST

The authors made no disclosures.

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