Micro-ultrasound vs. MRI for prostate cancer diagnosis: Considerations to address (Re: Comparison of micro-ultrasound and multiparametric magnetic resonance imaging for prostate cancer, *CUAJ*, Jan 2021)

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We read with great interest the recent article by Klotz et al, in which they propose an alternative imaging modality to aid prostate cancer diagnosis. Their study reports superior diagnostic performance of prostate micro-ultrasound as defined by greater sensitivity, specificity, negative predictive value (NPV), and positive predictive value (PPV), over multiparametric magnetic resonance imaging (mpMRI).[1] We applaud the authors for this innovative and progressive trial; however, we feel there are methodological considerations that require attention, particularly if future evaluations of this technology are planned.

First, the impact of tumor location is not fully considered. Eure et al have previously highlighted the phenomenon of ultrasound signal loss in the deeper anterior zone of the prostate.[2] This is particularly relevant when we consider that the Prostate Risk Identification using Micro-Ultrasound (PRI-MUS) protocol is limited to the peripheral zone evaluation only. However, Eure and colleagues have recently demonstrated that the ExactVu micro-ultrasound system was able to effectively visualize prostate tumors across all mpMRI zones, which provides promise for further updates of the PRI-MUS protocol in the detection of anterior zone cancers.[2] In the future, it would be valuable to see validation of diagnostic accuracies of micro-ultrasound in deeper prostatic zones through the provision of more detailed information on tumor location.

Next, it appears that interobserver variation in the present study is potentially under-reported for both Prostate Imaging-Reporting and Data System (PI-RADS) and PRI-MUS scores. Previous work has suggested that despite the complexity of mpMRI interpretation, PI-RADSv2.0 enables decent interobserver agreement, with the lowest Kappa Cohen coefficient being 0.57 between readers.[3] Insight into the interobserver variation in this study would be interesting, particularly for PRI-MUS scoring, as there is currently a paucity of literature in this field. Indeed, reassuring levels of interobserver variation would be of paramount importance to help strengthen the introduction of micro-ultrasound for prostate cancer diagnosis.

Other limitations may pertain to the micro-ultrasound technique itself. While micro-ultrasound offers potential convenience by combining both imaging risk stratification and biopsy guidance in the same setting, this does, unfortunately, reduce the opportunity for multidisciplinary pre-biopsy discussion (for example, between radiologists and urologists for difficult/uncertain cases). This factor is particularly important if micro-ultrasound is suggested as a replacement for mpMRI, as opposed to being a useful adjunctive modality.

Overall, we believe this important paper has contributed to the development of imaging-based risk-stratification for suspected prostate cancer. The high value of NPV associated with micro-ultrasound could potentially reduce the number of biopsies required, and we are excited to see the future of this novel technology. However, considerations regarding full anatomic visualization and intimate, user-dependent technique accuracy are crucial and must be addressed directly in future clinical evaluation.

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