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ABDOMINAL IMAGING

LETTER TO THE EDITOR

Reply: comments on the diagnostic value of ADC texture analysis in PI-RADS 5 lesions

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Dear Editor,

We appreciate the opportunity to respond to the insightful comments regarding our recently published study. We are grateful for the reader's recognition of the clinical importance of distinguishing between prostate carcinoma and prostatitis in Prostate Imaging Reporting and Data System (PI-RADS) 5 lesions using texture analysis on apparent diffusion coefficient (ADC) maps.

As noted, although our model achieved an impressive accuracy of 96.8% and a sensitivity of 98.7%, we acknowledge that the specificity (60.0%) and negative predictive value (71.6%) indicate significant potential for further refinement. Improving the differentiation of these false-positive "mimickers" remains a priority for urogenital radiology.

Regarding the limitations raised, we would like to provide additional context. First, the challenge of image heterogeneity across different magnetic resonance imaging scanners is a well-known hurdle in radiomics. We consciously avoided traditional preprocessing techniques such as Z-score normalization or muscle-fat referencing, as these can introduce errors through tissue distribution compression or physiological variability.[1] Instead, we prioritized first-order (low-order) texture parameters, such as median and signal coefficient of variation. Research indicates that first-order features demonstrate significantly lower variability and higher robustness across different platforms compared with high-order metrics, especially in ADC images where spatial resolution is limited.[2] By utilizing consistent field strengths and parameters, we aimed to minimize noise while ensuring the methodology remains practical for clinical application.

Secondly, regarding the reliability of pathological confirmation, all PI-RADS 5 lesions included in this study had a diameter greater than 1.5 cm. Their larger size reduced the risk of missed diagnoses. To ensure reliability, we employed systematic biopsy supplemented by 1–2 targeted cores specifically at the suspicious sites. This combined approach, supported by clinical follow-up, substantially mitigates the risk of missing malignant foci in large lesions.

Third, our region of interest (ROI) delineation workflow involved a junior radiologist's initial segmentation followed by a rigorous audit by two experienced senior radiologists. We believe this consensus review model is often more representative of real-world clinical workflows than independent double-segmentation. It ensures a high level of expertise in the final ROI while maintaining feasibility in a high-volume clinical environment. Looking forward, the integration of artificial intelligence-assisted segmentation tools will likely standardize this process further.[3]

Finally, we agree that the development of more robust machine learning models and the execution of large-scale, multi-center trials are essential steps to validate these findings. We remain committed to refining these diagnostic tools to reduce unnecessary biopsies and improve patient outcomes. We thank the reader again for their constructive feedback and for contributing to the advancement of prostate imaging.

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Conflict of interest disclosure

The authors declared no conflicts of interest.

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