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ABDOMINAL IMAGING

LETTER TO THE EDITOR

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

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Dear Editor,

I read with great interest the research article titled "Texture analysis enhances diagnostic accuracy of lesions scored as 5 in the Prostate Imaging Reporting and Data System in magnetic resonance imaging," published by Bai et al.[1] in Diagnostic and Interventional Radiology. In this study, the authors investigated the diagnostic value of apparent diffusion coefficient (ADC) mapping texture analysis in distinguishing prostate carcinoma from prostatitis in lesions scored as Prostate Imaging Reporting and Data System (PI-RADS) 5. This approach focuses on a problem that is extremely meaningful and important in clinical practice. I commend the authors for these clinically valuable and comprehensive study, and I would like to offer a few additional perspectives.

This study applied only first-order texture analysis to ADC maps and reported highly favorable diagnostic performance for the combined clinical and ADC texture model, achieving an accuracy of 96.8%, a sensitivity of 98.7%, and an area under the curve of 93.1%. The relatively low spatial resolution of ADC maps and the considerable variability in acquisition and post-processing parameters across scanners can limit detailed image analyses.[2] In this context, the first-order texture analysis chosen for the study appears to be an appropriate and rational approach for evaluating ADC maps, as it reflects the distribution of voxel values within the selected region of interest (ROI). In contrast, more advanced radiomics metrics (such as GLCM, GLRLM, and GLSZM) may exhibit lower reproducibility in ADC maps with limited spatial resolution. Therefore, it is noteworthy and encouraging that the authors achieved such remarkable results in diagnostic differentiation using first-order texture analysis, a simpler and more practical approach, without resorting to advanced radiomics analyses. Based on these results, I fully agree with the authors' view that first-order texture analysis can be a powerful diagnostic aid in differentiating PI-RADS 5 benign and malignant lesions.

Nevertheless, the study has several important limitations. First, the use of images acquired from different magnetic resonance imaging scanners introduces heterogeneity that may influence texture analysis and potentially bias the results. Second, the use of three different methods for histopathological confirmation (biopsy, TUR-P, and radical prostatectomy) represents a relevant limitation. In particular, in cases diagnosed as prostatitis based solely on biopsy, the possibility of sampling inadequacy should not be overlooked. Third, volumetric analyses of the ADC maps were performed by a single reader using slice-by-slice ROI delineation. Current studies recommend that at least two independent readers perform segmentation and that only features demonstrating high intraclass correlation coefficients be included in the final analysis.[3] Lastly, robust machine learning models could be created using texture analysis data to develop clinical, texture analysis, and combined models.

In conclusion, the authors demonstrate that the model developed in this important study enables practical and highly accurate differentiation between benign and malignant PI-RADS 5 lesions, which is a critically important clinical problem in urogenital radiology practice. I believe that with further development and resolution of certain methodological limitations, such models have the potential for successful integration into clinical practice.

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Conflict of interest disclosure

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