Accuracy of Multiparametric Magnetic Resonance Imaging in Confirming Eligibility for Active Surveillance for Men with Prostate Cancer


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BACKGROUND: Active surveillance (AS) is an attempt to avoid overtreatment of clinically insignificant prostate cancer (PCa); however, patient selection remains controversial. Multiparametric prostate magnetic resonance imaging (MP-MRI) may help better select AS candidates.

METHODS: We reviewed a cohort of men who underwent MP-MRI with MRI/Ultrasound fusion-guided prostate biopsy and selected potential AS patients at entry using Johns Hopkins criteria. MP-MRI findings were assessed, including number of lesions, dominant lesion diameter, total lesion volume, prostate volume, and lesion density (calculated as total lesion volume/prostate volume). Lesions were assigned a suspicion score for cancer by MRI. AS criteria were reapplied based on the confirmatory biopsy, and accuracy of MP-MRI in predicting AS candidacy was assessed. Logistic regression modeling and chi-square statistics were used to assess associations between MP-MRI interpretation and biopsy results.

RESULTS: Eighty-five patients qualified for AS with a mean age of 60.2 years and mean prostate-specific antigen level of 4.8 ng/mL. Of these, 25 patients (29%) were reclassified as not meeting AS criteria based on confirmatory biopsy. Number of lesions, lesion density, and highest MRI lesion suspicion were significantly associated with confirmatory biopsy AS reclassification. These MRI-based factors were combined to create a nomogram that generates a probability for confirmed AS candidacy.

CONCLUSION: As clinicians counsel patients with PCa, MP-MRI may contribute to the decision-making process when considering AS. Three MRI-based factors (number of lesions, lesion suspicion, and lesion density) were associated with confirmatory biopsy outcome and reclassification. A nomogram using these factors has promising predictive accuracy for which future validation is necessary.