MRI-Ultrasound Fusion Targeted Biopsy of Prostate Imaging Reporting and Data System Version 2 Category 5 Lesions Found False-Positive at Multiparametric Prostate MRI

Alison D Sheridan[1,2], Sameer K Nath[3,4], Sanjay Aneja[4], Jamil S Syed[5], Jay Pahade[1], Mahan Mathur[1], Preston Sprenkle[5], Jeffrey C Weinreb[1], Michael Spektor[1]
Affiliations expand

- PMID: 29489409
- DOI: 10.2214/AJR.17.18680

Abstract

Objective: The purpose of this study was to determine imaging and clinical features associated with Prostate Imaging Reporting and Data System (PI-RADS) category 5 lesions identified prospectively at multiparametric MRI (mpMRI) that were found benign at MRI-ultrasound fusion targeted biopsy.

Materials and methods: Between January 2015 and July 2016, 325 men underwent prostate mpMRI followed by MRI-ultrasound fusion targeted biopsy of 420 lesions prospectively identified and assessed with PI-RADS version 2. The frequency of clinically significant prostate cancer (defined as Gleason score ≥ 7) among PI-RADS 5 lesions was determined. Lesions with benign pathologic results were retrospectively reassessed by three abdominal radiologists and categorized as concordant or discordant between mpMRI and biopsy results. Multivariate logistic regression was used to identify factors associated with benign disease. Bonferroni correction was used.

Results: Of the 98 PI-RADS 5 lesions identified in 89 patients, 18% (18/98) were benign, 10% (10/98) were Gleason 6 disease, and 71% (70/98) were clinically significant prostate cancer. Factors associated with benign disease at multivariate analysis were lower prostate-specific antigen density (odds ratio [OR], 0.88; $p < 0.001$) and apex (OR, 3.54; $p = 0.001$) or base (OR, 7.11; $p = 0.012$) location. On secondary review of the 18 lesions with benign pathologic results, 39% (7/18) were scored as benign prostatic hyperplasia nodules, 28% (5/18) as inflammatory changes, 5% (1/18) as normal anatomic structures, and 28% (5/18) as discordant with imaging findings.

Conclusion: PI-RADS 5 lesions identified during routine clinical interpretation are associated with a high risk of clinically significant prostate cancer. A benign pathologic result was significantly correlated with lower prostate-specific antigen density and apex or base location and most commonly attributed to a benign prostatic hyperplasia nodule. Integration of these clinical features may improve the interpretation of high-risk lesions identified with mpMRI.