Out-of-bounds: The significance of extraprostatic extension on multiparametric magnetic resonance imaging for local staging of prostate cancer

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See related article on page 261

The use of multiparametric magnetic resonance imaging MRI (mpMRI) in the diagnosis of prostate cancer (PCa) has become increasingly widespread, with multiple studies demonstrating that MRI-targeted prostate biopsies, in conjunction with systematic biopsies, detect more clinically significant PCa than either method alone.[1-3] This strategy also detects fewer indolent cancers and allows some men to avoid a biopsy all together. Moreover, mpMRI offers excellent soft tissue differentiation and is often also used for preoperative local staging.

In the single-institution retrospective study by Griffiths et al in this issue of *CUAJ,*[4] the authors examined the likelihood of pathological T3 disease in the radical prostatectomy (RP) specimen in 191 patients based on the finding of extracapsular extension on preoperative mpMRI (mECE) vs. the finding of perineural invasion (PNI) on prostate biopsy (PBx). PNI is routinely examined on PBx, but its significance remains controversial and unclear. Some retrospective studies have found PNI to be independently associated with ECE at the time of RP,[5] higher surgical Gleason score,[6] positive margins,[7] and biochemical recurrence.[5] However, other studies have been unable to consistently demonstrate these findings,[6,8] and some have argued that men with evidence of PNI in the biopsy specimen, who would otherwise be candidates for active surveillance, should not be excluded from this treatment option.[9]

In the study by Griffiths et al, PNI was present in 22.8% of biopsy specimens, and 37% of patients were found to have pT3+ PCa after undergoing RP. On mpMRI, mECE was classified as either present (6.3%), suspicious (16.8%), or absent (77%). While the specificity was very high for definite ECE (98.3%), the sensitivity of reporting definite ECE or suspicious ECE on MRI was only 14.1% (95% confidence interval [CI] 7.3–24.8), and 23.9% (95% CI 4.9–35.8), respectively. When the authors examined the subset of patients without suspicion for mECE, PNI was not associated with increased risk of pT3+ disease. The authors concluded that the definite presence of ECE on MRI was 4.84 times more likely to result in worse pathological stage on RP compared to 2.25 times more likely when PNI is present at the time of PBx. Interestingly, suspicious ECE did not have the same predictive value for pT3+ disease, suggesting that further improvements in the ability to detect ECE are still necessary.

A meta-analysis of 45 studies examining the accuracy of MRI reported that the sensitivity for ECE is only 57% (95% CI 49–64), while the specificity was 91% (95% CI 88–93).[10] The sensitivity for the detection of EPE, therefore, remains low across many studies in the literature, despite the advances in prostate imaging. The authors acknowledge that the reporting of ECE is not standardized, unlike the Prostate Imaging Reporting & Data System (PI-RADS) scoring system, and interobserver variability may affect interpretation. One of the challenges of detecting ECE on imaging is the fact that many patients may have ECE that is microscopic or very focal in nature, and these patients would be expected to have a more favorable prognosis than those with the extensive ECE that would otherwise be grossly visible on imaging.[11-13] Nevertheless, with the increasing use of mpMRI in the diagnosis and staging of PCa, the findings of this study are thought-provoking and certainly worthy of further investigation.

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