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Concordance between Biparametric MRI and Radical Prostatectomy Specimen in the Detection of Clinically Significant Prostate Cancer and Staging

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Abstract : Introduction and Objectives: MRI has an increasing role in the diagnosis and staging of prostate cancer. Multiparametric MRI includes multiple sequences, including T2 weighting, diffusion weighting, and dynamic contrast enhancement (DCE). Administration of DCE is expensive, time-consuming, and requires medical supervision due to the risk of anaphylaxis. Biparametric MRI (bpMRI), without DCE, overcomes many of these issues; however, there is conflicting data on its accuracy. Furthermore, data on the concordance between bpMRI lesion and pathology specimen, as well as the rates of cancer stage upgrading after surgery, is limited within the available literature. This study aims to examine the diagnostic test accuracy of bpMRI in the diagnosis of prostate cancer and radiological assessment of prostate cancer staging. Specifically, we aimed to evaluate the ability of bpMRI to accurately localise malignant lesions to better understand its accuracy and application in MRI-targeted biopsies. Materials and Methods: One hundred and forty patients who underwent bpMRI prior to radical prostatectomy (RP) were retrospectively reviewed from a single institution. Histological grade from the prostate biopsy was compared with surgical specimens from RP. Clinically significant prostate cancer (csPCa) was defined as Gleason grade group ≥2. bpMRI staging was compared with RP histology. Results: Overall sensitivity of bpMRI in diagnosing csPCa independent of location and staging was 98.87%. Of the 140 patients, 29 (20.71%) had their prostate biopsy histology upgraded at RP. 61 (43.57%) patients had csPca noted on RP specimens in areas that were not identified on the bpMRI. 55 (39.29%) had upstaging after RP from the original staging with bpMRI. Conclusions: Whilst the overall sensitivity of bpMRI in predicting any clinically significant cancer was good, there was notably poor concordance in the location of the tumour between bpMRI and eventual RP specimen. The results suggest that caution should be exercised when using bpMRI for targeted prostate biopsies and validates the continued role of systemic biopsies. Furthermore, a significant number of patients were upstaged at RP from their original staging with bpMRI. Based on these findings, bpMRI results should be interpreted with caution and can underestimate TNM stage, requiring careful consideration of treatment strategy.

Keywords : biparametric MRI, Ca prostate, staging, post prostatectomy histology
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