Multiparametric MRI and Prostate Cancer Staging

Introduction and Objectives: Does multiparametric (MPI) MRI offer more than conventional MRI? Clinical staging is fraught with problems with DRE, TRUS, biopsy characteristics all having limitations. MPI may offer advantages to the clinician.
Materials and Methods: This is a partly retrospective and prospective study of 354 patients undergoing radical prostatectomy. Their preoperative MRI was compared to final pathological staging. The T staging was divided into T2a, T2b, T2c, T3a, T3b where the radiologist had committed to this. There were 298 who had conventional MRI and 56 had pre biopsy MPI.
Results:
Conventional MRI.
Correct = 22%
Overstaged = 20%
Understaged = 58%
Sensitivity = 28%
PPV =52%
Weighted kappa = 0.15 poor
Multiparametric MRI.
Correct = 30%
Overstaged = 9%
Understaged = 61%
Sensitivity = 33%
PPV = 77%
Weighted kappa = 0.175 poor
The stages were then allocated to either T2 or T3 disease.
Conventional MRI.
Sensitivity = 78%
PPV = 86%
Weighted kappa = 0.272 fair
Multiparametric MRI.
Sensitivity = 70%
PPV = 93%
Weighted kappa = 0.237 fair
Discussion: Distinction between intracapsular (T1-2) and extracapsular disease has the most profound influence on treatment decisions. DRE often underestimates stage. More extensive examinations for T staging are recommended when curative treatment is an option. There is no direct relation between PSA and clinical/pathological stage. PSA, biopsy score and clinical stage combined fares better. TRUS is limited and no better than DRE; 3D mapping is more accurate then 12 core biopsy. CT and MRI are insufficient to be mandatory in assessment of local invasion. Endorectal coil MRI offers advantaged over external coil MRI. The results influence whether to spare nerves at radical surgery. MPI for T substaging is better than conventional MRI but its kappa statistic is still poor. When the results are all grouped into either intra or extracapsular extension, the kappa weighting for both improves to a “fair” rating yet MPI performs slightly worse than conventional MRI.
Conclusion: Despite advances in computer imaging technology, more data needs to be collected for MPI as its role in staging remains elusive.