The role of magnetic resonance image guided prostate biopsy in stratifying men for risk of extracapsular extension at radical prostatectomy. Raskolnikov D, George AK, Rais-Bahrami S, Turkbey B, Siddiqui MM, Shakir NA, Okoro C, Rothwax JT, Walton-Diaz A, Sankineni S, Su D, Stamatakis L, Merino MJ, Choyke PL, Wood BJ, Pinto PA. Urologic Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, Maryland; Molecular Imaging Program, National Cancer Institute, National Institutes of Health, Bethesda, Maryland; Laboratory of Pathology, National Cancer Institute, National Institutes of Health, Bethesda, Maryland; Center for Interventional Oncology, National Cancer Institute & Clinical Center, National Institutes of Health, Bethesda, Maryland; Center for Interventional Oncology, National Cancer Institute & Clinical Center, National Institutes of Health, Bethesda, Maryland; e-mail: pintop@mail.nih.gov.J Urol. 2015 Jul;194(1):105-11. [Epub 2015 Jan 23]. doi: 10.1016/j.juro.2015.01.072.

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Abstract

PURPOSE: Magnetic resonance imaging detects extracapsular extension by prostate cancer with excellent specificity but low sensitivity. This limits surgical planning, which could be modified to account for focal extracapsular extension with image directed guidance for wider excision. In this study, we evaluate the performance of multiparametric magnetic resonance imaging in extracapsular extension detection and determine which preoperative variables predict extracapsular extension on final pathology when multiparametric magnetic resonance imaging predicts organ confined disease.

MATERIALS AND METHODS: From May 2007 to March 2014, 169 patients underwent pre-biopsy multiparametric magnetic resonance imaging, magnetic resonance imaging/transrectal ultrasound fusion guided biopsy, extended sextant 12-core biopsy, and radical prostatectomy at our institution. A subset of 116 men had multiparametric magnetic resonance imaging negative for extracapsular extension and were included in the final analysis.

RESULTS: The 116 men with multiparametric magnetic resonance imaging negative for
extracapsular extension had a median age of 61 years (IQR: 57-66) and a median prostate specific antigen of 5.51 ng/ml (IQR: 3.91-9.07). The prevalence of extracapsular extension was 23.1% in the overall population. Sensitivity, specificity, and positive and negative predictive values of multiparametric magnetic resonance imaging for extracapsular extension were 48.7%, 73.9%, and 35.9% and 82.8%, respectively. On multivariate regression analysis, only patient age (P = 0.002) and magnetic resonance imaging/transrectal ultrasound fusion guided biopsy Gleason score (P = 0.032) were independent predictors of extracapsular extension on final radical prostatectomy pathology.

CONCLUSIONS: Because of the low sensitivity of multiparametric magnetic resonance imaging for extracapsular extension, further tools are necessary to stratify men at risk for occult extracapsular extension that would otherwise only become apparent on final pathology. Magnetic resonance imaging/transrectal ultrasound fusion guided biopsy Gleason score can help identify which men with prostate cancer have extracapsular extension that may not be detectable by imaging.

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KEYWORDS: Adenocarcinoma; Neoplasm staging; Prognosis; Prostate; Risk

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