proceed with multicenter validation trial which will be initiated in December 2014.

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MP17-08

MRI-FUSION PROSTATE BIOPSY IN FIRST-TIME BIOPSY COHORT YIELDS INCREASED DETECTION OF CLINICALLY SIGNIFICANT PROSTATE CANCER USING A SIMPLIFIED MRI GRADING SCALE

Steven V. Kardos, Shu Pan, Cayce B. Nawaf, New Haven, CT; Richard Fan, Palo Alto, CA; Daniel Cornfeld, Jeffrey Weinreb, Peter G. Schulam, Preston C. Sprenkle, New Haven, CT*

INTRODUCTION AND OBJECTIVES: Prostate cancer (PCa) is the most common solid organ malignancy in men and the second leading cause of cancer related death; however, it remains the only tumor diagnosed by a random sampling method. Multiparametric MRI (MP-MRI) has been reported in evaluation of men with a persistently elevated PSA after a negative biopsy (bx) and in active surveillance (AS) cohorts, but its role in initial diagnosis has not been independently reported. We describe cancer detection rates (CDR) with MRI-fusion for first-time prostate bx using a simplified 3-point Likert scale for grading prostatic lesions.

METHODS: Consecutive patients had an MRI fusion prostate bx for elevated PSA, abnormal DRE, AS, or prior negative bx with persistently elevated PSA. Regions of interest (ROIs) identified on MRI were assigned increasing cancer suspicion levels using a simplified 3-point Likert scale by a team of dedicated pelvic radiologists. The Artemis™ system was used to create an MRI-US fusion 3D model of the prostate and a single urologist (PS) performed both a 12-core transrectal systematic bx as well as a targeted bx of any ROI.

RESULTS: A total of 191 patients underwent MRI and fusion bx between 12/2012 and 8/2014. For the entire cohort, overall CDR for systematic bx was 52.3% and for fusion biopsy was 55.0%. However, the detection rate for clinically significant PCa (Gleason 7 or greater) with systematic bx was 28.7% and that for targeted bx was 43.8% ($p=0.02$). The first-time prostate bx cohort comprised 73 patients. In this group, overall CDR was 73.9% with cancer detected in 79.6% of patients with ROI as opposed to 33.3% of patients without ROI. Furthermore, in this cohort, the targeted bx CDR was 67.1% and systematic bx CDR was 56.2%. Most importantly, clinically significant cancer was detected in 38/73 (52.1%) patients with 36/64 (56%) detected on targeted bx and 27/73 (37%) detected on systematic bx. Evaluation of cancer suspicion level for each ROI revealed that patients with high suspicion scores had a higher overall CDR ($p<0.0001$) and higher risk of detecting clinically significant cancer ($p=0.0001$).

CONCLUSIONS: MRI fusion prostate bx using MP-MRI as a first-time bx has a higher overall and clinically significant CDR than systematic bx, and correlates with MP-MRI suspicion level. A simplified Likert grading scale in the hands of experienced radiologists correlates with cancer detection and clinically significant cancer. The high CDR of MRI fusion bx in a first-time cohort may alleviate the need for repeat bx and its associated morbidity.

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MP17-09

TRENDS IN CANCER DETECTION RATE AND COMPLICATIONS AFTER MAGNETIC RESONANCE IMAGING-ULTRASOUND (MRI/US) FUSION-GUIDED PROSTATE BIOPSIES

Simpa Salami, Oksana Yaskiv, New Hyde Park, NY; Baris Turkbey, Bethesda, MD; Robert Villani, Eran Ben-Levi, Ardeshir Rastinehad, New Hyde Park, NY*

INTRODUCTION AND OBJECTIVES: We hypothesized that as the quality of MRI interpretation and experience improves, the procedure duration and cancer detection rate (CDR) of Magnetic Resonance Imaging-Ultrasound (MRI/US) Fusion-Guided Prostate Biopsies will improve.

METHODS: We prospectively enrolled men with abnormal PSA and/or DRE, or on AS for CaP who underwent a 3T mpMRI (T2, DWI, and DCE) with an endorectal coil. Three radiologists (EB, RV, AR) reviewed and graded all lesions using the 5-point Likert scale as proposed by European Symposium on Urogenital Radiology, 2012. The UroNav system (Invivo, Florida ®) was used to perform MR/TRUS fusion-guided prostate biopsies under local anesthesia, obtaining one biopsy core in axial and sagittal planes from each lesion. A 12-core biopsy was performed at the same setting. All biopsies were performed by a fellowship-trained urologic oncologist with experience with fusion biopsies. Our institution's pathologist reviewed all biopsy slides. We divided the cohort into equal quartiles based on date of enrollment. We estimate the CDR, mean procedure time, and complication rate.

RESULTS: A total of 376 men were eligible for analysis. The median age and PSA were 65.2 years and 6.6 ng/mL respectively. The overall CDR was 66% (248/376). Suspicion score on mpMRI was positively correlated with detection of CaP ($p<0.0001$); 100% of those with a suspicion score of 5 had clinically significant CaP. The CDR for the 1st, 2nd, 3rd, and 4th quartiles (each $n = 94$) were 73.4%, 62.8%, 71.3%, 56.4% respectively (M-H p-value $= 0.052$). The mean procedure times for each quartile were 16, 17, 14, and 14 minutes respectively. The complications were: urinary tract infections/sepsis (2.7%) and urinary retention (1.3%).

CONCLUSIONS: We report that the CDR of fusion biopsy does not change significantly over time in the hands of an experienced urologist. The procedure time appears to improve with experience. Fusion biopsy is not associated with significant increase in complication risks compared with the general population. Further studies are needed to determine the learning curve in an inexperienced hands.

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MP17-10

EVALUATION OF PI-RADS CLASSIFICATION IN PREDICTION OF TUMOUR AGGRESSIVENESS – COMPARISON TO RADICAL PROSTATECTOMY SPECIMEN

Angelika Borkowetz, Ivan Platzek, Marieta Toma, Stefan Zastrow, Michael Froehner, Rainer Koch, Manfred Wirth, Dresden, Germany*

INTRODUCTION AND OBJECTIVES: The Prostate Imaging and Reporting Data System (PI-RADS) is told to represent a decision-making support for targeted biopsy of tumour-suspicious lesions in multiparametric MRI (mpMRI) of the prostate. We examined the applicability of this classification by direct comparison of mpMRI and radical prostatectomy specimen (PrS).

METHODS: We enrolled 65 patients who underwent radical prostatectomy. In all patients, PCa was proven by the combination of transperineal MRI/ultrasound-fusion prostate biopsy and a systematic transrectal 12-core-biopsy previously. All patients were examined by 3Tesla mpMRI (T2-, diffusion (DWI, ADC)- and perfusion-weighted sequences) evaluated according to the criteria of the European Society of Urogenital Radiology. Tumour-suspicious lesions were classified according to the PI-RADS classification. MpMRI and whole-mount PrS were compared by a uro-radiologist and a uro-pathologist directly. The correlation of PI-RADS and Gleason Score (GS) was evaluated.

RESULTS: 112 lesions were detected in mpMRI (PI-RADS$\leq$3: 59% (n=66); PI-RADS$\geq$4 41% (n=46)). In PrS, 206 cancer foci were proven (GS=6: 26% (n=54); GS$\geq$7: 74% (n=152)). PCa was detected in 89 (80%) lesions in mpMRI (GS=6: 13% (n=12), GS$\geq$7: 87% (n=77)). The tumour detection rate in lesions classified as PI-RADS$\geq$4 was 91% (42/46) and in those classified as PI-RADS$\leq$3 it was 73% (48/66), (p=0.015). In detail, the detection rate was 66% (GS=6: 6%; GS$\geq$7: 59%) in lesions with PI-RADS2 (n=17), 76% (GS=6: 18%; GS$\geq$7: 57%) in those with PI-RADS3 (n=49), 87% (GS=6: 4%; GS$\geq$7: 83%) in those with PI-RADS4 (n=30) and 100% (100% GS$\geq$7) in those with PI-RADS5 (n=16). The area under the curve (AUC) for detection of tumours with GS$\geq$7 was 0.646 (95% CI; 0.455-0.746).