RESULTS: The median age, PSA level, and PSA-Gi level were 67 years, 6.76 ng/mL, and 40.0 μM/mL, respectively. The median PSA-Gi levels (65.4 vs. 29.8 μM/mL, \( p = 0.001 \)) and PSA-Gi density (PSA-GiD) (0.210 vs. 0.0714 μM/mL/cc, \( p < 0.0001 \)) differed significantly between patients with and without biopsy-proven significant cancer (SC). Areas under the receiver operating characteristic (ROC) curves (AUC) for PSA-Gi (AUC: 0.764, \( p < 0.0001 \)) and PSA-GiD (AUC: 0.778, \( p < 0.0001 \)) were significantly greater than non-discrimination for the detection of SC. PSA-GiD and Gleason scores for index cancers were correlated in patients with biopsy-proven SC (\( n = 80 \)) (\( r = 0.249; \ p = 0.026 \)). Among patients with PI-RADS category 3 cancer (\( n = 87 \)), the median PSA-Gi level (44.1 vs. 26.7 μM/mL, \( p < 0.0001 \)) and PSA-GiD (0.139 vs. 0.0627 μM/mL/cc; \( p < 0.0001 \)) differed significantly between patients with and without biopsy-proven SC. The AUCs for PSA-Gi (AUC: 0.728, \( p < 0.0001 \)) and PSA-GiD (AUC: 0.771, \( p < 0.0001 \)) were significantly greater than non-discrimination for the detection of SC. The sensitivity, specificity, positive predictive value, and negative predictive value of PSA-GiD for the detection of SC were 79%, 65%, 46%, and 89%, respectively.

CONCLUSIONS: PSA-Gi and PSA-GiD may predict pathological findings of biopsy-proven index prostate cancers. PSA-GiD may predict the detection of SC in patients with highest PI-RADS category 3.

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MP22-15

ARE UROLOGISTS READY FOR INTERPRETATION OF MULTIPARAMETRIC MRI FINDINGS? A PROSPECTIVE MULTICENTRIC EVALUATION

Guglielmo Mantica*, Nazareno Suarti, Genoa, Italy; Salvatore Smelezio, Milan, Italy; Francesco Esperto, Rome, Italy; Roberto La Rocca, Naples, Italy; Marco Oderda, Turin, Italy; Marco Ennas, Genoa, Italy; Armando Stabile, Francesco De Cobelli, Milan, Italy; Luigi Napolitano, Naples, Italy; Rocco Papalia, Rome, Italy; Paolo Gontero, Turin, Italy; Franco Gaboardi, Milan, Italy; Luigi Napolitano, Naples, Italy; Seda Mkhitaryan, Gevorg Karaptyan, Roger De Filippo, Los Angeles, CA; Mya Thu, San Diego, CA; Laura Perin, Sargis Sedrakyan*, Los Angeles, CA

INTRODUCTION AND OBJECTIVE: Multiparametric MRI (mpMRI) represents a useful step for the diagnosis, staging and pre-operative planning of prostate cancer (PCa). However, the interpretation of mpMRI is difficult, and no data about the ability of urologists in this setting is available. We aimed to evaluate the performance of urologists in mpMRI images interpretation.

METHODS: Suspicious mpMRI images of 12 patients were selected by an expert radiologist and shown to 73 urologists from 7 institutions, using RadiAnt DICOM Viewer. Every participant had 3 minutes to evaluate each mpMRI. Four sequences were shown at the same time in loop: T2, Diffusion weighted imaging (DWI), Apparent Diffusion Coefficient (ADC), Contrast Enhancement (CE). All urologists were blinded to the results and were asked to identify the suspicious lesions. Data were analyzed according to urologists’ expertise (resident vs consultant) as well as previous experience in performing fusion prostate biopsies (FPB). Moreover, analyses were targeted in order to identify which prostatic lesions were more difficult to be detected. T-test and Chi-square test were used for analysis of continuous and categorical variables, respectively. Univariable and multivariable logistic regression analyses were used to identify the predictors of improved interpretation among urologists.

RESULTS: Two, 7, and 3 lesions were scored PI-RADS 3, 4 and 5, respectively. Four lesions were anterior, 8 posterior. Three, 7 and 2 lesions were apical, median and basal, respectively. A total of 73 urologists correctly filled the report form evaluating the 12 mpMRIs. The median (IQR) number of correct identifications was 8 (6-8). Apical vs. median vs. basal lesions were correctly identified by 67.6%, 61.6% and 54.8% of urologists, respectively. Anterior and posterior lesions were correctly identified by 50.9% and 67.2% of urologists while PI-RADS 3, 4 and 5 lesions by 56.8%, 57.9% and 74.9% of them, respectively. Urologists with experience in FPB were able to identify a higher number of lesions (6.87 vs. 6.73, \( p = 0.04 \)). No differences were seen between residents vs. consultants (\( p = 0.6 \)), nor among the various institutions (\( p = 0.7 \)). At multivariable logistic regression analyses, among urologists’ determinants of improved identification (defined by ≥8 correct lesions), previous experience in FPB (OR = 3.4; \( p = 0.03 \)) represented the only independent predictor of correct lesions characterization.

CONCLUSIONS: Lesion with higher PI-RADS score, with posterior location and located at the apex of the prostate are more likely to be correctly identified compared to basal and anterior ones. Practicing and dedication seem to be the major determinants of better lesion identification.

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MP22-16

DEVELOPMENT OF NON-INVASIVE CLINICALLY APPLICABLE IN VIVO TRACKING OF EXTRACELLULAR VESICLES USING MAGNETIC RESONANCE IMAGING (MRI)

Johnny Akers, San Diego, CA; Paola Aguiari, Hasnik Solyan, Seda Mkhitaryan, Gevorg Karaptyan, Roger De Filippo, Los Angeles, CA; Mya Thu, San Diego, CA; Laura Perin, Sargis Sedrakyan*, Los Angeles, CA

INTRODUCTION AND OBJECTIVE: Extracellular vesicles (EVs) derived from amniotic fluid stem cells (AFSC) hold great potential for the treatment of chronic kidney diseases (CKD). We have already shown that AFSC-EVs are renoprotective in a mouse model of CKD, Alport syndrome. However, there is an important unmet need for real-time in vivo monitoring of these therapeutic EVs after they are injected into a subject to understand their safety, targeting, and effectiveness. While current optical imaging solutions like bioluminescence and fluorescence are useful for EV tracking studies in animal models, there is limited utility in clinical applications. Here we present a novel in vivo tracking solution for our therapeutic EVs in Alport mice, utilizing clinically applicable MRI technology.

METHODS: To generate trackable EVs, AFSC were labeled with a novel magnetic agent (VSCM). EVs secreted by the labeled AFSC were isolated by ultracentrifugation. The viability and morphology of labeled-cells were evaluated, and the magnetic properties of labeled EVs were compared to non-labeled EVs. In vivo biodistribution of labeled EVs was evaluated in WT and Alport mice by MRI at 10 min and 3 hr post injection, and retro-orbital and intra-cardiac routes of delivery were compared.