

## PP11

### **MRI FUSION PROSTATE BIOPSY OUTPERFORMS 12-CORE SYSTEMATIC PROSTATE BIOPSY IN PATIENTS WITH PRIOR NEGATIVE BIOPSY: A MULTI-INSTITUTIONAL ANALYSIS**

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**Introduction & Objective:** Patients with persistently elevated prostate specific antigen (PSA) and prior negative 12-core prostate biopsy (or biopsies) are a diagnostic challenge. Repeat 12-core systematic biopsy (SBx) or saturation biopsy in this cohort has been shown to have even lower yield. The aim of our study is to compare the yield of MRI fusion biopsy (FBx) to SBx in a multi-institutional cohort comprised of patients with prior negative biopsies.

**Methods:** A multi-institutional review was performed on patients with history of one or more prior negative sextant biopsy who underwent multiparametric MRI (mpMRI) followed by FBx and SBx in the same session. Imaging protocol was standardized across institutions and mpMRI and pathology was reviewed by respective institutional genitourinary radiologists and pathologists. Patient demographic, clinical characteristics including Gleason score (GS) distribution were recorded. Clinically significant (CS) disease was defined as GS  $\geq$ 7. McNemar's test was used to compare cancer detection rates between FBx and SBx. Multivariate logistic regression was done to ascertain independent effect of number of prior negative bx on cancer detection through FBx and SBx.

**Results:** 782 patients (2007–14) from four institutions with a history of one or more negative systematic biopsy were included in the study. Median (IQR) age and PSA were 63.1(58.5-68.0) years and 8.5 (5.9-13.1) ng/dL. Median number of prior negative biopsies was 2.0 (1-3). Overall cancer detection rate was 44.6% (348 patients). CS prostate cancer detection rate was 30.9% (241 patients). 112 (46.4%) CS PCa were diagnosed both by SBx and FBx. FBx diagnosed more unique CS cancers than SBx (96/241 (39.8%) vs 33/241 (13.7%),  $p < 0.001$ ). When stratified by number of prior negative bx, FBx significantly outperformed SBx in detection of CS disease. On multivariate analysis, after adjusting for age, PSA, race, DRE findings, prostate volume and positive family history, each additional prior negative biopsy was associated with a 24% decrease in detection of CS disease by SBx ( $p < 0.001$ ). No statistically significant decline in cancer detection rate was found on FBx with increase in number of prior negative biopsies.

**Conclusion:** We demonstrate decreased detection by SBx of all and CS cancers with increased number of prior biopsies. FBx detected significantly more CS cancers in this cohort and it was independent of number of prior biopsies. Repeat SBx in patients with multiple prior negative biopsies will be hampered by lower cancer detection rate and a combination of FBx and SBx should be utilized in these patients.