Can the Time Interval between MRI and Fusion Biopsy Affect the Cancer Detection Rates?

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Introduction and overall goals: The use of multi-parametric MRI (mpMRI) to detect Prostate cancer (PCa) has rapidly evolved due to the ability to combine functional and anatomical information. Advances in imaging have led to development of platforms that fuse mpMRI with real-time TRUS images. A growing body of evidence has shown that mpMRI fusion biopsies (FBx) reliably improves the detection rates of clinically significant cancer (CSC) as compared to systematic biopsies, leading to an increased adoption of this technology. mpMRI and FBx are performed on different days, and therefore the period of time between them could affect cancer detection rates. Despite the multiple studies that support incorporating MRI/FBx for diagnosis of PCa, to our knowledge there are no previous reports that evaluate the possible impact of the time interval between the mpMRI and the FBx.

Specific Aims: We sought to evaluate variations in the PCa detection rates after mpMRI/FBx based on the time interval between the mpMRI and FBx.

Rationale and background: mpMRI and FBx are performed on different days, and therefore the period of time between them could affect the fusion of the mpMRI and the US images, thereby affecting the cancer detection rates. Despite the multiple studies that support incorporating MRI/FBx for diagnosis, to our knowledge there are no previous reports that evaluate the possible impact of the time interval between the mpMRI and the FBx.

Materials & Methods: Patients undergoing mpMRI/FBx for elevated PSA at our institution between 10/2014 and 07/2018 were included. Time between mpMRI and FBx was evaluated as continuous and categorical variable. Data was documented on per lesion basis. Generalized estimating equation models for correlated binary outcome data were fitted to assess the effect of time or time-intervals between mpMRI and FBx on the histopathological findings in mpMRI. Separated models were fitted for the detection of any cancer (Gleason ≥ 6) or CSC (Gleason ≥ 7) with adjustment for relevant characteristics.

Results: A total of 1,181 lesions from 806 men were analyzed. PCa was detected in 34.5% (407) of the lesions, with CSC in 21.4% and indolent PCa in 13%. Adjusting for PI-RADS score, previous biopsy status, age, race/ethnicity and marital status, the detection rates of any or CSC were not statistically different in any of the time intervals between the mpMRI and FBx (Overall test: p=0.931 and p=0.538, respectively for any cancer and CSC). Likewise, there was no association between time as a continuous variable from mpMRI to FBx and PCa detection (p=0.849 and p=0.666, respectively). The main limitation was a low number of patients with long intervals between mpMRI and FBx.

Conclusions: Our data suggests that the time from mpMRI to FBx is not a predictor of PCa detection on FBx. While these findings require further validation in cohorts with longer time intervals between MRI and fusion biopsy, it provides important information for patients and providers about the timing of biopsy after MRI.