

Concordance Between MRI Fusion vs TRUS Prostate Biopsy and Final Pathology at Radical Prostatectomy: Data from the PURC

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INTRODUCTION AND OBJECTIVE: Studies suggest that MRI-fusion guided (MRI-fusion) biopsies are superior to the transrectal ultrasound guided (TRUS) technique. Herein, we present the Pennsylvania Urologic Regional Collaborative (PURC) experience with MRI fusion biopsy. We aimed to calculate concordance rates between TRUS prostate needle biopsy versus MRI fusion biopsy and final pathology at the time of radical prostatectomy within our cohort.

METHODS: Within PURC, a prospective quality improvement collaborative of urology practices in Pennsylvania and New Jersey, we identified all men who underwent either a TRUS prostate needle biopsy, or an MRI fusion prostate needle biopsy, followed by radical prostatectomy for definitive treatment of prostate cancer from 2015 to 2018. We analyzed International Society of Urological Pathology Grade Group (GG) scoring and calculated the concordance and upgrading rates at the time of biopsy versus final pathology at radical prostatectomy. To assess for differences between our rates, we performed a test of equal proportions and Pearson's chi-squared test. We defined significance as $p < 0.05$.

RESULTS: We identified 1,437 patients who underwent TRUS ($n=1247$) or MRI Fusion ($n=196$) biopsies, followed by radical prostatectomy. Overall pathologic grading distribution at time of biopsy was: 35.8% ($n=515$) Grade Group (GG) 1, 28.5% ($n=409$) GG 2, 13.3% ($n=191$) GG 3, 11.5% ($n=165$) GG 4, and 10.9% ($n=157$) GG 5. Median number of cores at TRUS biopsy was 12 (IQR: 12,13). Median number of cores at MRI Fusion biopsy was 15 (IQR 13,18). Therefore, we inferred patients who underwent MRI Fusion biopsy also underwent standard TRUS biopsies at that time. Figure 1 illustrates differences in exact concordance rate between MRI fusion + TRUS and TRUS biopsies. The overall rate of upgrading on final pathology for MRI fusion +TRUS biopsies was 5.7% lower than for TRUS biopsies, but this was not statistically significant (35.2% vs 40.9%, 95% CI: 1.5-13.0%, $p=0.06$).

CONCLUSIONS: MRI fusion plus TRUS biopsies demonstrated higher concordance rates with final pathology at the time of radical prostatectomy than TRUS prostate biopsies alone.

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Biopsy Type	Number of Biopsies Concordant with Final Pathology	Total Number of Biopsies Performed	Percent Concordance
TRUS	438	1,241	35.3%
MR Fusion	87	196	44.4%
Total	525	1,437	36.5%

On average, the concordance rate for MRI Fusion biopsy is 9.1% higher (95% CI: 1.6% - 16.5%) than the concordance rate of TRUS biopsy ($p < 0.01$)

Chi-Square test for independence p value=0.01