MP20-10

TEMPORAL TRENDS IN PROSTATE BIOPSY CRITERIA AND OUTCOMES FROM 2012-PRESENT: THE COLUMBIA EXPERIENCE

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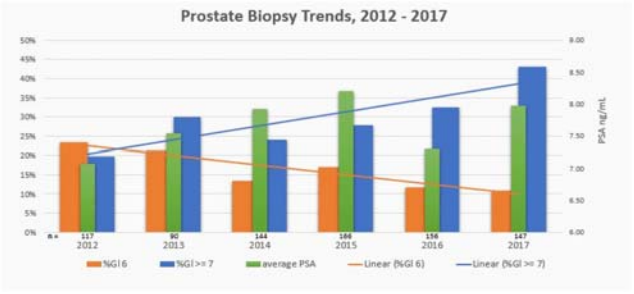
INTRODUCTION AND OBJECTIVE: In 2012, the United States Preventive Services Task Force (USPSTF) issued guidelines discouraging screening for prostate cancer using prostate specific antigen (PSA). We evaluated trends in our biopsy practices during this time period, with the hypothesis that criteria for biopsy became increasingly stringent, and there was a shift in diagnosis from low risk to higher risk disease.

METHODS: We queried our institution's electronic medical record for transrectal ultrasound-guided prostate biopsies (CPT code 55700) from 2012-2017. Patient and biopsy parameters (age, PSA, standard vs. MRI fusion biopsy, Grade Group [GG]), were recorded. Biopsies for PSA >50 ng/mL or those done for surveillance were excluded. Chi-square correlation assessed differences between % clinically significant prostate cancer (csPCa, defined as GG $\geq$ 2) and %GG1 diagnosis between 2012 and 2017. Multivariate logistic regression assessed predictors of csPCa as well as clinically insignificant prostate cancer (GG1).

RESULTS: A total of 1,031 prostate biopsies were reviewed, and 927 were retained as initial diagnostic biopsies. Overall, PSA increased 0.35 ng/mL/year. The %csPCa increased from 20% in 2012 to 43% in 2017 ($p < 0.001$) while the %GG1 decreased from 23% to 11% ($p = 0.004$). On multivariable logistic regression, year was a significant independent predictor of csPCa (OR 1.13, $p = 0.016$). Year was also an independent predictor of GG1 disease with a 14% decreased odds of GG1 diagnosis with each additional year (OR 0.86, $p = 0.013$).

CONCLUSIONS: In the post-2012 era, there has been migration in prostate biopsy outcomes from low risk to higher risk disease. Rising PSA for biopsied patients during this time reflects more stringent criteria for biopsy. While less diagnosis of low grade disease ("overdiagnosis") is a desirable outcome, increased detection of high grade disease is potentially worrisome. The effects of these shifts on prostate cancer mortality and advanced disease will become evident over time.



	Logistic Regression Analysis on Clinically Significant Prostate Cancer on Biopsy (≥ GG2).			
	Univariate		Multivariable	
Variable	OR (95% CI)	p-value	OR (95% CI)	p-value
Age	1.05 (1.03 – 1.07)	<0.001	1.04 (1.04 – 1.06)	<0.001
PSA	1.08 (1.06 – 1.11)	<0.001	1.07 (1.04 – 1.10)	<0.001
PSAD*100	1.07 (1.05 – 1.08)	<0.001	--	--
Fusion bx	1.95 (1.37 – 2.76)	<0.001	1.55 (1.04 – 2.33)	0.033
Year	1.21 (1.11 – 1.33)	<0.001	1.13 (1.02 – 1.25)	0.016

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MP20-11

OPTIMAL PROSTATE BIOPSY REGIME FOR THE 21ST CENTURY: IS IT NECESSARY TO DO A COMBINED TARGET AND SATURATION BIOPSIES?

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INTRODUCTION AND OBJECTIVE: There is no agreement what the optimal prostate biopsy strategy is in the MRI era; whether to do target only or target combined with systemic biopsy. A recent meta-analysis suggested that MRI-Target biopsy only could miss up to 13% clinically significant prostate cancer (CSPC) [1]. The Dutch 4M study [2] using an in-bore MRI-guided biopsy and the MRI-First study [3] could miss 5-8% CSPC. Our aims were to determine the missed CSPC rate for target and saturation biopsies using a robotic-assisted trans-perineal MRI-Fusion biopsy platform (TP MRI-Fusion BX) and the related complications.

METHODS: Between 2015 to 2019, 241 patients with elevated PSA and mpMRI scan were recruited into a prospective study for TP MRI-Fusion Target and saturation biopsies (MRI-TBX+SBX) using a robotic-assisted iSR'obot Mona LisaTM biopsy platform. 3T MRI scan identified PIRAD lesions and were classified according to PIRADv2. Any PIRAD$\geq$3 lesions were targeted.

RESULTS: Out of 241 TP-Fusion-BX patients, 235 (95.4%) patients had MRI-TB+SBX with 306 PIRAD lesions targeted: 116 (48%) were biopsy-naïve, 73 (30%) prior negative biopsy and 52 (22%) on AS. CSPC for biopsy-naïve patients were 38%, 26% prior negative biopsy and 39% CSPC for AS with a mean age 65years;median PSA 7.32ng/dL. Mean target cores 5.45±2.60;mean positive target cores 1.75±2.52; median 5 target cores. Mean target lesion volume 0.95±1.54cc (IQR 0.05−11.81cc); Median target lesion volume 0.38cc. Mean right saturation cores 13.77±4.30, median cores 13 (IQR 5−31); mean left saturation cores 13.41±4.66, Median 13(IQR 3−34) cores. Mean right positive saturation core 1.38±2.10(IQR 1-11);Mean left positive saturation core 1.31±1.90 (IQR 1−9). Mean core length 56.25±31.58mm (IQR 6.0−167.00mm); mean core length involved by tumour 15.72±20.89mm. The proportion of cores positive for cancer was 565 out of 1792 (31.5%) cores for MRI-TBX and 647 out of 6531 (9.9%) for MRI-SBX. 46.4% (n=109) had target and saturation positive (T+/S+) for cancer;6.4% (n=15) had target only (T+/S-) positive for cancer;35.3% (n=83) had target negative and saturation negative (T-/S-); 11.5% (n=27) saturation only (T-/S+) positive for cancer. For T-/S+ group, 27 patients had a total of 39 target lesions were negative for cancer. 74.1% (n=20) had insignificant cancer and 25.9% (n=7) CSPC. Out of 7 missed CSPC, 1 lesion was a PIRAD 3, 5 were PIRAD 4 and 1 a PIRAD 5. 57.1% (4/7)CSPC were on the contralateral side of the

target lesion. From our cohort, we would miss 2.97%(7/235)CSPC. Post biopsy sepsis was 0.9% and urinary retention 10%.

CONCLUSIONS: Robotic-assisted target and saturation biopsies had a miss rate 2.97% CSPC. This was 2 to 3 times lower than doing target only and target plus systematic biopsy. The proportion of cores positive for cancer was 565 out of 1792 (31.5%) cores for MRI-Fusion target biopsy and 647 out of 6531(9.9%) for MRI-SBX. This was comparable to a recent systematic review [1] (31% Target and 11% Systematic biopsies). 57.1% missed CSPC was on the contralateral side of the PIRAD lesions. However, by taking more cores, the retention rate was up to 10%. Our result demonstrated that by doing saturation biopsies, we would miss less CSPC but at a price of having higher morbidities.

Reference:
1. Eur Uro 76(2019);284-303.
2. Eur Uro 75(2019);570-78.
3. Lancet Oncol 2019;20:100-09

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MP20-12

ASSESSING THE DELIVERABLES OF TEMPLATE BIOPSY ON THE IPSILATERAL SIDE OF THE TARGET LESION AT THE TIME OF FUSION TARGETED PROSTATE BIOPSY

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INTRODUCTION AND OBJECTIVE: The Actionable intelligence metric (AIM) and Reduction metric (ReM) were introduced to objectify fusion biopsy deliverables across patient cohorts. The AIM metric affords a quantifiable assessment of when US/MRI fusion targeted biopsy (TB) technology provides actionable information over standard systematic template biopsy (SB). Meanwhile, ReM captures the cases where a SB could have been omitted. Here, we specifically assess deliverables of standard template biopsy on the ipsilateral side of the targeted lesion.

METHODS: Using a prospectively maintained database, we identified men who underwent targeted fusion prostate biopsy using the UroNav System (Invivo®) at our tertiary care Cancer Center who also had a full 12-core template biopsy at the same time. AIM was defined as all patients with higher Gleason score (GS) on TB (minimum GS$\geq$3+4 =7) relative to SB divided by total patients with GS$\geq$3+4=7 CaP (i.e. % patients for whom TB offered actionable information over SB). ReM was defined as 1 - [all patients with higher GS on SB relative to TB $\div$ total patients undergoing biopsy] (i.e. % patients who could have foregone SB).

RESULTS: 747 fusion-targeted biopsies were performed at our institution between March 2014-July 2019 (median age: 65, median PSA 6.1). Targeted biopsies that were midline or that did not specify laterality were excluded (n = 57). A standard template biopsy on the ipsilateral side of a positive target achieves an AIM of 17.73% and ReM of 69%, while template biopsy on the contralateral side of the target achieves an AIM of 21.2% and ReM of 70% when compared the overall AIM of 26% and ReM of 82%. A PIRADS 5 lesion on MRI was a significant predictor of positive biopsy on both ipsilateral (OR =1.7 CI 1.05-2.77 p=0.03) and contralateral (OR=4.8 CI 2.85-8.19 p $<$ 0.01) template biopsies. Data are summarized in Tables 1 and 2.

CONCLUSIONS: Both fusion targeting and bilateral standard template biopsy should be performed when targetable lesion is seen on mpMRI. Standard template prostate biopsy should not be omitted either on the ipsilateral or on the contralateral side of the targeted lesions.

	p-value	OR	95% C.I.for OR	
			Lower	Upper
Age	.203	1.016	.992	1.040
PSA	.162	1.017	.993	1.042
Biopsy Status- naïve (ref)	.000			
Biopsy Status prior negative	.000	.244	.151	.395
Biopsy Status on active surveillance	.453	.862	.584	1.271
PIRADS 3 (ref)	.084			
PIRADS 4	.362	1.209	.804	1.817
PIRADS 5	.030	1.708	1.054	2.771
Prostate Volume	.000	.985	.977	.993

Table 1: Logistic regression to identify predictors of positive contralateral biopsy

	p-value	OR	95% C.I.for OR	
			Lower	Upper
Age	.002	1.040	1.014	1.067
PSA	.000	1.080	1.037	1.125
Biopsy Status- naïve (ref)	.000			
Biopsy Status prior negative	.000	.356	.221	.575
Biopsy Status on active surveillance	.093	1.443	.940	2.213
PIRADS 3 (ref)	.000			
PIRADS 4	.023	1.572	1.065	2.321
PIRADS 5	.000	4.834	2.852	8.191
Prostate Volume	.000	.973	.966	.981

Table 2: Logistic regression to identify predictors of positive ipsilateral biopsy

Source of Funding: None

MP20-13

DEFINING "TECHNICAL MISS" DURING SOFTWARE FUSION MRI-TARGETED BIOPSY: A COMPARISON OF PROSTATE CANCER DETECTION RATES BETWEEN TARGETED AND SYSTEMATIC CORES

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INTRODUCTION AND OBJECTIVE: Prostate multiparametric magnetic resonance imaging (MRI) has been increasingly incorporated into the diagnosis and management of prostate cancer (PCa). Software fusion MRI-targeted biopsy (MRITB) has emerged as a valuable adjunct to the standard 12-core systematic biopsy. However, even with MRI guidance, cancerous foci are missed on biopsy. This study attempts to define a "technical miss" for MRITB and attempts to identify factors contributing to a "technical miss."

METHODS: Patients were selected from a prospectively maintained database of consecutive men who underwent MRI prior to MRITB between September 2014 and December 2015. All patients also underwent 12-core systematic biopsy. Patients with highest PI-RADS lesion less than 3 or for whom volumetric calculation of MRI lesions was not available were excluded. We defined "regional cores" as biopsy cores from the geographic sextant region corresponding to the MRI lesion on systematic biopsy. "Technical miss" was defined as higher Gleason score on the regional core than the MRITB cores. Univariate analysis was performed for MRI lesion volume, zone (transitional vs. peripheral), aspect (anterior vs. posterior) and PI-RADS score (3-5).

RESULTS: We identified 155 lesions in 119 patients. Mean age was 64.3 $\pm$ 7.1 years with mean prostate-specific antigen 8.9 $\pm$ 10.1 ng/mL. PCa was found in 31% (13/42) of PI-RADS 3 lesions, 60% (36/60) of PI-RADS 4 lesions and 57% (30/53) of PI-RADS 5 lesions. Technical misses occurred for three (7.1%) PI-RADS 3 lesions (one Gleason 6 and two Gleason 7), six (10%) PI-RADS 4 lesions (three Gleason 6, one Gleason 7, and two Gleason $>$7), and three (5.7%) PI-RADS 5 lesions (two Gleason 7, and one Gleason $>$7). We found no significant difference in technical miss