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Systematic biopsy is unnecessary for the detection of clinically significant prostate cancer in men with PIRADS 5 and PSA density greater than 15%

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Introduction: To evaluate the detection of clinically significant prostate cancer (CSPCa) by systematic (SB) and target biopsy (TB) in men with Prostate Imaging Reporting and Data System - PIRADS 5; and the need for SB in this population.

Materials and methods: We identified consecutive patients with PIRADS 5 lesion on multiparametric MRI (mpMRI; 3 T, T2W, DWI, ADC, DCE) undergoing prostate biopsy (PBx) for suspicion of PCa, from our PBx database (IRB# HS-13-00663). Patients underwent mpMRI followed by 12-core SB and at least two TB cores per PIRADS 5 lesion. All MRIs were re-reviewed by an experienced radiologist. PBx were performed by an expert urologist using an MRI-transrectal ultrasound fusion system (Koelis). Each core-biopsy was labeled individually and interpreted according to ISUP Grade Group (GG) standards. Men with prior treatment for PCa or poor-quality MRI were excluded. The positive predictive value (PPV) of PIRADS 5 on MRI for CSPCa (GG ≥ 2) detection on PBx was analyzed. PSA density (PSAD) was calculated by dividing PSA by prostate volume on MRI.

Results: A total of 124 patients met inclusion criteria. The median (IQR) age, PSAD, number of positive cores, cancer core length and percent were: 69Y (64–75), 0.23 ng/ml/cc (0.13–0.36), 7 (5–9), 12 mm (9–15) and 90% (70–95), respectively. The CSPCa detection rate for SB+TB, TB and SB was 88%, 82% and 65%, respectively. SB added 6% CSPCa detection to TB. The PPV for SB + TB of PIRADS 5 for any GG PCa and for CSPCa was 95% and 88%. Only 6 (6/124 = 5%) patients were not diagnosed with PCa on PBx: 2 with granuloma, 2 HGPIN, 1 focal inflammation, 1 benign prostatic tissue, but with metastatic PCa on pelvic lymph node biopsy. Considering only patients with PSAD > 0.15 ng/ml/cc (N = 86; 68% of the entire cohort), the CSPCa detection rate for SB+TB, TB and SB was: 95%, 92% and 72%. SB added 3% CSPCa detection to TB. Three (3/86 = 3.5%) patients with PSAD > 0.15 ng/ml/cc were diagnosed with CSPCa only on SB, and GG 1 PCa on TB. Had they been diagnosed with GG 1 on TB alone; these patients would not meet criteria for active surveillance because of high PSA or large cancer volume. The PPV for SB + TB of PIRADS 5 for any GG PCa and for CSPCa in men with PSAD > 0.15 ng/ml/cc was 98% and 95%, respectively.

Conclusions: PIRADS 5 on mpMRI showed high positive predictive value for CSPCa on prostate biopsy. In those with PSAD > 0.15 ng/ml/cc, systematic biopsy marginally increased CSPCa, but not overall PCa detection in comparison to target biopsy alone. Systematic biopsy didn't affect patients' management and could be omitted on this population.

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Upstaging after radical prostatectomy in clinically localized intermediate and high-risk prostate cancer: The role of obesity

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Introduction: To evaluate body mass index (BMI) as risk factor for lymph node invasion (LNI) in patients with clinically localized intermediate- and high-risk classes prostate cancer (PCa) according to European Association of Urology (EAU) risk classification.

Materials and methods: Patients with clinical intermediate and high EAU risk classes without LNI underwent RP with or without ePLND. The decision to perform an extended lymph node dissection in intermediate risk class patients was based on pre-operative nomograms showing a risk of lymph node invasion greater than 5%. Clinical parameters as BMI, total testosterone (TT), percent of positive cores (BPC) and others were evaluated. Patients were stratified according to EAU classes, BMI and BPC. Multinomial logistic regression was used to evaluate the association of clinical factors with the risk of multiple occult metastases.

Results: Between November 2014 and December 2018, 726 consecutive Caucasian patients were enrolled. Among these, robot-assisted radical prostatectomy (RARP) was performed in 640 cases (88.2%) and open retro-pubic radical prostatectomy (ORP) in 86 subjects (11.8%). The distribution of the patient population according to EAU risk classes was as follows: low risk 176 cases (24.2%), intermediate risk 386 subjects (53.2%), high risk 118 patients (16.3%) and locally advanced 46 cases (6.3%). Extended PLND was performed during 446 RARPs (69.7%) and 79 ORPs (91.9%). Clinically localized PCa was diagnosed in 404 patients of which 343 (84.9%) underwent RARP and 61 (15.1%) underwent RRP. The LNI rate was higher in the EAU high-risk class (23.7%) compared to the EAU intermediate risk class (9.1%). The distribution of multiple occult metastases was higher in the EAU high-risk class (11.9%) compared to the intermediate class (3.5%). BMI, BPC and EAU risk group were significantly associated with the risk of LNI. Significantly lower TT levels were detected in overweight and obese patients compared to cases with BMI < 25 kg/m².

On multivariate analysis, obesity was an independent predictor of multiple LNI (OR = 3.219; 95%CI: 1.186–8.734), together with BPC > 50% (OR = 3.281; 95%CI: 1.323–8.138) and EAU high-risk class (OR = 3.080; 95%CI: 1.275–7.440).

Among metastatic patients, being overweight (OR = 4.533; 95%CI: 1.212–16.963) and obesity (OR = 5.950; 95%CI: 1.223–28.951) were the only clinical factors associated with the risk of multiple lymph node metastases.

Conclusions: BMI is an independent predictor of the risk of multiple lymph node metastases in patients with clinically localized intermediate- and high-risk EAU classes PCa staged by an ePLND template. In EAU intermediate and high-risk classes, obese patients represent a special risk category harboring clinically occult multiple metastases. BMI should be considered in the LNI risk calculators.

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Radiomic analysis of T2 and ADC mpMRI images in the diagnosis of clinical significant prostate cancer: An early experience

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Introduction: PI-RADS score V2 assesses the likelihood of clinically significant (CS) Prostate Cancer (PCA) at multiparametric (mp) magnetic resonance imaging (MRI). PI-RADS score improved the detection of CS PCA but still have some limitations. It is operator dependent, doesn't give informations about tumor aggressiveness and was not designed for 3D volume delineation. Radiomic is an artificial intelligence (AI) technique considered as an emerging approach for imaging evaluation. It's able to extract quantitative data from images and to build mathematic models for the prediction of PCA learning more and more from data acquisition. Aim of our study was to develop a Radiomic tool analysis by using T2 weighted (T2w) and apparent diffusion coefficient (ADC) MRI imaging addressing its diagnostic accuracy, sensitivity and specificity for the diagnosis of CS PCA.

Materials and methods: From September 2018 to August 2019, 91 patients underwent MRI systematic plus targeted fusion biopsy at our Institution. MRI images (T2 and ADC) of all the prostate gland