MP16-18
OPTIMAL COMBINATION OF MRI-TARGETED BIOPSY AND SYSTEMATIC BIOPSY FOR MEN WITH SUSPICION OF PROSTATE CANCER

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INTRODUCTION AND OBJECTIVES: Magnetic resonance imaging (MRI)-targeted prostate biopsy (MRBX) is an effective biopsy procedure for with suspicion of prostate cancer on MRI. However, some significant cancer (SC) is missed using MRBX. Use of systematic prostate biopsy (SBX) for negative areas on MRI to detect SC missed by MRBX is not established for this indication. In this study, we aimed to explore the optimal combination of SBX and MRBX in these patients.

METHODS: Between 2014 and 2015 at our institution, 271 men underwent MRBX with or without SBX based on prebiopsy multiparametric 1.5T MRI. Of these, 52 were excluded from the analysis because of PSA levels >40 ng/ml, obvious clinical T3-4 disease or biopsy with an insufficient number of cores for severe comorbidity. The remaining 219 men who underwent MRBX and SBX in one session according to our biopsy protocol were enrolled in this study. MRBX was performed under cognitive or MRI/transrectal ultrasound fusion. Using MRBX, four-core samples for one suspicious lesion on MRI were performed. The SBX protocol was a transperineal 18-core biopsy. SC was defined as clinical stage T2b or greater, biopsy Gleason score of 4+3 or greater, or maximum cancer length of 5 mm or greater. Cancer other than SC was defined as indolent cancer (IC). SC that was not detected or that was detected as IC using MRBX, but that was detected as SC using SBX was defined as MRBX-missed SC. The frequency of MRBX-missed SC was investigated. A SBX protocol that could sufficiently detect MRBX-missed SC with a minimum number of sampling cores was determined.

RESULTS: The median PSA was 7.5 ng/ml, and one/two suspicious lesions were observed in 204/15 patients, respectively, using MRI. The detection rate of any cancer or SC using both MRBX and SBX was 76% or 61%, respectively. Frequency of MRBX-missed SC to overall SC was 13% (21/135). MRBX results in MRBX-missed SC patients was no cancer in 8 and IC in 13. Of 21 MRBX-missed cancer, a maximum of 10, 13, 15, 17, 19, 20 and 21 MRBX-missed SC were detected using 2, 4, 6, 8, 10, 12 and 14 SBX sampling cores, respectively. When we set the SC detection rate using both MRBX and the transperineal 18-core SBX at 100%, a minimum of 6 sampling cores in SBX (in addition to MRBX) were required to detect 95% of overall SC as SC. The six SBX sampling locations were bilateral transperineal anterior, posterior and far lateral sites.

CONCLUSIONS: The combination of transperineal 6-core SBX and MRBX could be an optimal biopsy strategy that strikes a balance between SC detectability and sampling number for men with suspicion of prostate cancer on MRI.

Source of Funding: None

MP16-19
BXCHIP™ CLINICAL TISSUE ARRAY INCREASES CANCER DETECTION RATE & AMOUNT OF TISSUE AVAILABLE FOR PATHOLOGIST REVIEW

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INTRODUCTION AND OBJECTIVES: Due to significant cuts in reimbursement, more efficient histology techniques are needed to maintain the economic viability of the histology laboratory. There is also an increasing need to maximize tissue preservation for ancillary testing. The BxChip™(Leavitt Medical Inc. Patent Pending) is a clinical tissue array made of an artificial tissue-like material which easily receives and holds multiple tissue cores. Encasing numerous needle cores, enables the arrayed samples to be processed, embedded and sectioned as though they were a single standard tissue. Colored dividers between each core allow the pathologist to distinguish different anatomic sites, while providing orientation of each core. The purpose of this study is to compare the overall prostate cancer detection rates and the average amount of tissue present (average area and core-length) on normal slides versus those made with BxChip clinical tissue arrays.

METHODS: 267 consecutive twelve pack prostate needle biopsies were analyzed during a 5 week period. Approximately half of the cases were processed and embedded using the BxChip clinical tissue array and the other cases were done with conventional blocks and slides. The cases were matched according to the urologist performing the procedure in order to account for biopsy technique. Slide tissue measurements were performed using a Leica SCN 400 scanner, and images were stored, sorted and measured using DIH software (Leica).

RESULTS: Comparing traditional sectioning to CHIP based sectioning the cross sectional surface area of tissue on the glass slide available for review and length of biopsy tissue on the slide increased from an average of 4.8 mm2 and 10.7 mm to 5.5 mm2 and 14.1 mm respectively. This was significant at a level of $p<0.0001$ The cancer detection rate increased from 49.5% to 58.8% comparing traditional sectioning to Chip based sectioning $p<0.0001$ Current diagnostic molecular techniques have been validated on this platform.

CONCLUSIONS: Superior prostate biopsy performance is achieved by utilizing the BxChip clinical tissue arrays. Additionally, this comes with tremendous cost savings to the laboratory.

Source of Funding: None

MP16-20
METABOLIC SYNDROME IS ASSOCIATED WITH INCREASED RISK OF PROSTATE CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS

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INTRODUCTION AND OBJECTIVES: Several preclinical and clinical evidences suggest the possible association between metabolic syndrome (MetS), metabolic factors and the risk of prostate cancer (PCa). The aim of this systematic review and meta-analysis is to estimate the risk of PCa in men with MetS vs. those without MS.

METHODS: The search terms included “prostate”, “prostate cancer”, “biopsy”, “metabolic syndrome”, “insulin resistance”, “obesity, “hypertension”, “triglycerides”, “cholesterol”. We also searched reference lists of relevant articles. MetS was defined according to the USA National Cholesterol Education Program – Adult Treatment Panel III (NCEP-ATPIII). Previous diagnosis of hypertension and type-2 diabetes mellitus were included as evidence of raised blood pressure or fasting glucose.

Ln(OR) were calculated to determine 1) the risk of having PCa in patients with MetS vs. those without MetS, 2) the role of each MetS factors, 3) the risk of high-grade (8-10) bioptical Gleason Score.

RESULTS: In total, 247 studies were identified from the online databases and relevant references. After evaluating the title and abstract of each study, 21 were identified as eligible for this systematic review, with a total of 110945 participants, including 19618 (17.68%) with and 91327 (82.32%) without MetS. There was a statistically significant heterogeneity in these studies ($x2=126.65$, $I2=84\%$, $p<0.00001$).

In men with MetS the pooled ORs [95%CI] of having PCa was 1.17 [1.00-1.36] ($p<0.01$). However, when considering each components of MetS, hypertension was the only factor that increase the risk of PCa with a pooled ORs [95%CI] of 1.12 (1.04-1.22) ($p<0.01$). MetS was associated with an increased risk of high-grade bioptical Gleason Score (8-10) with an OR of 1.89 [1.50-2.38] ($p<0.01$). The test of overall effect was not statistical significant ($Z=1.41$, $p=0.16$).

CONCLUSIONS: Our meta-analysis suggests that MetS has a minimal impact on the overall occurrence of PCa, but it can be strongly related with more aggressive (with higher BGS) neoplasms. Among the single MetS components, only hypertension seems to be associated with an higher risk of PCa. The significant heterogeneity of the studies included in this review must be considered an important bias of our meta-analysis. More well-conducted trials are needed to confirm our data.

Source of Funding: None