08:30 - 10:00 **Room O**

Oncologic Imaging

RPS 116

Oncologic imaging in genitourinary: kidney and prostate, advanced topics

Moderators:
G. Frauenfelder; Rome/IT
H.-P. Schlemmer; Heidelberg/DE

RPS 116-K 08:30
Keynote lecture
H. Hricak; *New York, NY/US*

Author Disclosures:
H. Hricak: nothing to disclose

RPS 116-1 08:40
Upgrading to significant disease with monitoring prostate MRI scans and repeat biopsy in men on active surveillance for low-risk prostate cancer: are confirmatory biopsies still necessary?
D. F. Osses, F.-J. Drost, J. F. M. Verbeek, M. J. Roobol, I. G. Schoots; *Rotterdam/NL (i.schoots@erasmusmc.nl)*

Purpose: To investigate whether serial prostate magnetic resonance imaging (MRI) may guide the utility of repeat targeted (TBx) and systematic biopsy (SBx) in monitoring men with low-risk prostate cancer (PCa) at one year in active surveillance (AS).
Methods and materials: We included 111 consecutive men with low-risk (ISUP grade 1) PCa who received protocolled repeat MRIs with or without TBx and repeat SBx at one-year AS. TBx was performed in PI-RADS score ≥3 lesions. Upgrading defined as ISUP grade ≥2 PCa (I), grade ≥2 PCa with cribriform growth/intraductal carcinoma (II), and grade ≥3 PCa (III) was investigated.
Results: Upgrading (I) was 32% (35/111). Upgrading in MRI-positive and MRI-negative men was 48% (30/63) and 10% (5/48) (p<0.001), respectively. In MRI-positive men, upgrading was 23% (7/30) by TBx only and 33% (10/30) by SBx only. Progressive change (PRECISE score 4-5) on positive MRI was observed in 27% (17/63). Upgrading (I) occurred in 41% (7/17) of these men, which was 50% (23/46) in men without progressive change (PRECISE score 1-3) on positive MRI (p=0.534). Upgrading (II) was 15% (17/111). Upgrading in MRI-positive and MRI-negative men was 22% (14/63) and 6% (3/48) (p=0.021), respectively. Upgrading (III) was 5% (5/111). Upgrading in MRI-positive and MRI-negative men was 6% (4/63) and 2% (1/48) (p=0.283), respectively.
Conclusion: In serial MRI-negative men, the added value of repeat SBx at one-year surveillance is limited and should be balanced individually against the harms. In serial MRI-positive men, the added value of repeat SBx is substantial. SBx should be performed together with TBx in all MRI-positive men at one-year surveillance. Biopsy should not be omitted in men without progressive disease on positive MRI.
Limitations: n/a
Ethics committee approval: n/a
Funding: No funding was received for this work.
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M. J. Roobol: nothing to disclose
I. G. Schoots: nothing to disclose

RPS 116-2 08:46
ECE score: a new MRI scale to evaluate and stratify the risk of extracapsular extension in patients with prostate cancer
S. Varello, M. Gatti, F. Gentile, I. Ruggirello, L. Allois, A. Carisio, C. Dianzani, P. Fonio, R. Faletti; *Turin/IT (sara.varello@gmail.com)*

Purpose: To analyse the performance of different prostate imaging features associated with prostate cancer (PCa) extracapsular extension (ECE) in order to develop an ECE-score.
Methods and materials: A retrospective study on 114 patients who underwent multiparameter prostate MRI (mp-MRI) at 1.5Tesla using a 32 phased-array coil before radical prostatectomy was conducted. mp-MRIs were analysed for the length of contact between PCa and the prostatic capsule, capsule irregularity, bulge, loss of capsule, neurovascular bundle thickening, measurable extra-capsular disease, and DWI signal increase in extra-capsular location, and ADC value and PSA density were calculated. The data was analysed with a parametric test and 5 diagnostic parameters. A threshold of 90% in specificity and positive predictive value was used to distinguish between major and minor criteria. The ECE-score was tested with the ROC curve procedure.
Results: ECE was found at histopathological review in 41 patients (ECE+). Capsule irregularity, bulge, loss of capsule, neurovascular bundle thickening, DWI signal increase in extra-capsular location, and measurable extra-capsular disease had a highly significant difference between ECE+ and others (p<0.0001). Capsule irregularity, bulge, and loss of capsule were included in the minor criteria and neurovascular bundle thickening and DWI signal increase in the extra-capsular location were included in the major criteria. The ECE-score was equal to 1 for the presence of 0 criteria, 2 for 1 minor, 3 for 2 minor, 4 for 3 minor or 1 major, and 5 for 2 major criteria or the presence of measurable extra-capsular disease. The ROC curve procedure established the good ability of the ECE-score to discriminate ECE+ with an AUC of 0.93 (0.87-0.98).
Conclusion: The ECE-score proposed can improve the detection of ECE and allow for more accurate staging, providing important additional information for optimal patient-tailored treatment planning.
Limitations: A monocentric and retrospective study. The absence of interobserver variability.
Ethics committee approval: n/a
Funding: No funding was received for this work.
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I. Ruggirello: nothing to disclose
L. Allois: nothing to disclose
A. Carisio: nothing to disclose
C. Dianzani: nothing to disclose

RPS 116-3 08:52
Influence of the minimum b-value on prostate cancer assessment using conventional DWI and DKI models
N. Adubeiro[1], L. Nogueira[1], R. G. Nunes[2], H. A. Ferreira[2], E. F. C. Ribeiro[1], J. M. La Fuente[1]; *[1]Porto/PT, [2]Lisbon/PT (nca.estsp@gmail.com)*

Purpose: To investigate the influence of the minimum b-value in diffusion parameters estimated for prostate tissues using mono-exponential and kurtosis models.
Methods and materials: 58 patients were prospectively enrolled to perform magnetic resonance imaging of the prostate at 3.0T. A diffusion-weighted sequence using 11 b-values ranging from 0-2,000 s/mm^2 was used.
Mono-exponential and kurtosis models were fitted to the diffusion signal. 6 different b-value combinations were used to estimate the apparent diffusion coefficient (ADC) while varying the minimum b-value (0, 50, 100, 150, 200, and 500 s/mm^2) and b-values up to 1,100 s/mm^2. Diffusion kurtosis imaging (DKI) metrics were computed using b-values ranging from 0-2,000 s/mm^2 and considering the same minimum b-values.
The Mann-Whitney test was used to assess differences in diffusion metrics between prostate cancer (PCa) and normal tissue. Differences in b-value combinations were assessed with the Friedman test. Receiver operating characteristics curves were performed for each metric.
Results: ADC and the mean diffusivity (MD) were significantly lower and the mean kurtosis (MK) was significantly higher (p<0.001) in PCa compared to normal tissue for all b-values combinations.
MK did not change with the minimum b-value for normal tissue or PCa (p>0.05), but ADC and MD differed significantly.
The MK metric achieved the highest AUC (96.0%) and accuracy (93.8%) using all b-values (0-2,000 s/mm^2) but the diagnostic performance was not statistically improved when compared to ADC or MD.
Conclusion: MK values were not influenced by the chosen low b-value, indicating that microperfusion effects do not influence MK, contrarily to ADC and MD.
The diagnostic performances of ADC, MD, and MK were similar.
Limitations: Prostate lesions were confirmed by transrectal ultrasound-guided biopsy.
Ethics committee approval: Approved by the hospital ethics committee [number 251/12 (190-DEFI/195-CES)] and all patients gave written informed consent.
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Author Disclosures:
N. Adubeiro: nothing to disclose
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E. F. C. Ribeiro: nothing to disclose