Oncology - Clinical
Scientific Paper Session (Oral)
Prostate/GU2
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9:45 AM - 11:15 AM
Room West Building - 221-222

No. 343

Initial experience in restaging of patients with recurrent prostate cancer: Comparison of 11C-Choline-PET/MR and 11C-Choline-PET/CT. Matthias Eiber¹, Michael Souvatzoglou², Tobias Maurer³, Sibylle Ziegler², Ernst Rummeny¹, Markus Schwaiger², Ambros Beer²; ¹Radiology, TU Muenchen, Munich, Germany, ²Nuclear Medicine, TU Muenchen, Munich, Germany, ³Urology, TU Muenchen, Munich, Germany.

Objectives: Whole-body integrated PET/MR might provide an alternative imaging tool to 11C-Choline-PET/CT for restaging prostate cancer due to the high soft-tissue contrast of MR compared to CT with potential advantages for detection of local recurrence and bone metastases.

Methods: 31 patients underwent a single-injection/dual-imaging protocol with PET/CT (Siemens Biograph 64, Ø5min after injection) followed by PET/MR (Siemens Biograph mMR; Ø51min after injection). PET/MR covered chest to pelvis (~ 3-4 BP, 4min. per BP) including acquisition of a coronal Dixon-VIBE for attenuation-correction, a coronal T1w SE and an axial fat-sat T2w sequence. During an additional 20min PET-scan over the pelvis axial/coronal T2w, axial DWI (b-values 0,400,800s/mm²) and axial T1w-DCE sequences were acquired. Axial CE fat saturated T1w-GRE sequences were used for the trunk. PET/MR and PET/CT were read separately, all suspicious lesions were rated on a three-point-scale (1: definitely metastasis, 2: probably metastasis, 3: indeterminate). Clinical follow-up served as SOR.

Results: Despite a substantially longer imaging time for 11C-Choline-PET/MR (Ø41min) compared to PET/CT (Ø23min) the protocol was well tolerated by all patients. Detection rate for local recurrence was higher and more conclusive for PET/MR which detected 17 regions in 12 patients (mean rating 1.12) compared to PET/CT (12 regions in 8 patients; mean rating 1.40). For lymph node metastases a similar performance was found with 42 and 39 regions respectively (mean rating 1.38 and 1.45). PET/MR detected bone metastases in 17 regions in 5 patients (mean rating 1.17) whereas PET/CT found 14 regions in 4 patients (mean rating 1.15).

Conclusions: Our preliminary data indicate that a fully diagnostic comprehensive 11C-Choline-PET/MR protocol for restaging of prostate cancer is technically feasible and well tolerated. It potentially offers a higher detection rates especially in case of small local recurrences.
Prediction of the disease free survival in patients with advanced breast cancer after first cycle of neoadjuvant chemotherapy using parallel PET/MR. Jihyun Park1, Ilhan Lim1, Woo Chul Noh2, Hyun-Ah Kim2, Eun-Kyu Kim2, Seung Sook Lee3, Byung Il Kim1, Chang Woon Choi1, Sang Moo Lim1; 1Nuclear Medicine, Korea Institution Radiological & Medical Science, Seoul, Republic of Korea, 2Surgery, Korea Institution Radiological & Medical Science, Seoul, Republic of Korea, 3Pathology, Korea Institution Radiological & Medical Science, Seoul, Republic of Korea.

Objectives: To determine whether PET/MR could predict disease-free survival (DFS) in patients with advanced breast cancer after neoadjuvant chemotherapy (NCT).

Methods: Fifty-four patients with advanced breast cancer were enrolled and they underwent 3 cycles of NCT. Before the 1st NCT (#1), after the 1st NCT (#2), after the 2nd NCT (#3), and before surgery (#4), all patients underwent PET/MR: whole body FDG PET/CT, breast MR, and delayed breast PET/CT sequentially in prone position. MR consisted of T2, diffusion weighted image (DWI), and dynamic enhanced MR. All patients were analyzed by diverse parameters [maxSUV, change of maxSUV (SUVratio) apparent diffusion coefficient (ADC), steepest slope of the enhancement curve (SS), size and other clinical parameters]. A relationship between covariates and DFS after operation was analyzed using Kaplan-Meier method and multivariate Cox proportional-hazard regression method.

Results: The median DFS of 54 patients was 661 days (78-1037 days). Among parameters, higher SUVratio#2 (p < 0.0001) and higher SS#2 (p = 0.0001) were significantly associated with poorer DFS. Patients with pathologic response, ER positive, PR positive, higher ADC#2 showed better DFS, but not significantly (p = 0.113, p = 0.13, and p = 0.118, respectively). On multivariate analysis, SUVratio (p = 0.0015; HR = 77.10; CI 5.4-1103.6) and SS#2 (p = 0.029; HR = 8.89; CI 1.3-62.2) were found as independent predictors of DFS.

Conclusions: SUVratio#2 and SS#2 measured by parallel PET/MR after first cycle of NCT can predict DFS in patients with advanced breast cancer.