Prospective Comparison multi contrast with diffusion weighted imaging whole body MRI, whole body PET-CT and whole body CT for staging advanced melanoma

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PURPOSE: This protocol intent to compare multicontrast whole body MRI with whole body PET CT and whole body CT in order to correctly detect secondary lesions in advanced melanoma and to evaluate benefits of whole body (wb) DWI in addition conventional oncologic whole body MRI protocol (1).

METHODS: 38 patients (18m/20f; mean age 58 years-range to 28 to 84 years) with stage IIa to IV AJCC were examined before treatment using multicontrast whole body MRI (General Electric HC HDx). 5 subsequent table positions STIR coronal (whole body), and axial(neck) T1w coronal 3D PAVA after contrast (brain, neck, pelvis), T1w coronal 3D Lava after contrast (thorax, abdomen) and free-breathing SS- EPI DWI axial 10 subsequent table positions with parallel imaging, factor b 600 mm^2/s (neck, thorax, abdomen, pelvis), factor b 1000 mm^2/s (brain) (total acquisition time 60min). The same day, whole body PET-CT was performed (400 Mbq F-18-FDG, native CT low technique total acquisition time 60 min) and a whole body CT (General Electric VCT, 64 channels after contrast). Multicontrast wb MRI, wb PET-CT and wb CT

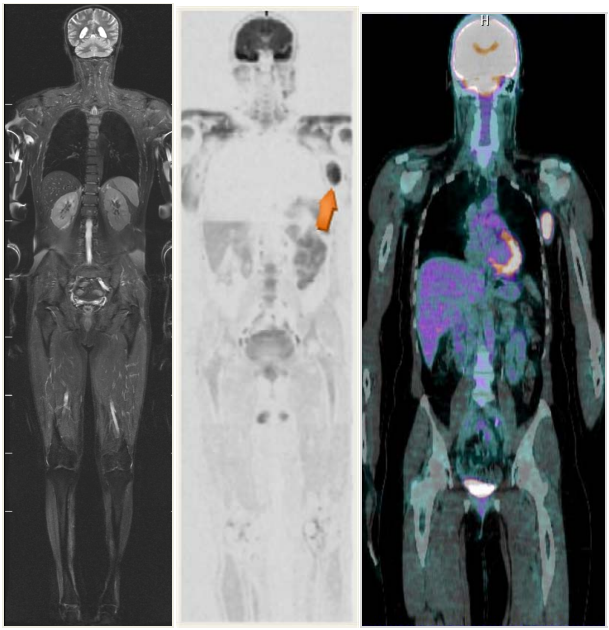

Fig. 1 : T2w MRI, DW MRI, PET CT.

(Fig 1) were interpreted independently by two specialists in nuclear medicine, two specialists in MRI and two specialists in CT to report each suspicious lesion malignancy: number, localization and degree of suspicion. In cases of discrepancy follow up wb PET-CT and CT, biological markers and clinical status served as control. Indepently two others specialists in MRI interpreted mc wb MRI without DWI (only with T2w and T1w) and after with DWI to evaluate benefit of these sequence to detect more suspicious lesions.

RESULTS: 124 lesions were evaluated, 70 were malignant. For mc wb MRI sensibility, specificity, PPV were respectively 82,6%, 97,5% and 98,2% (p=0,0023), for wb PET CT 72,8%, 92,6% and 94,4% (p=0,0006); for the wb CT 79,7%, 97,2%, 98,08% (p=0,0013). Mc wb MRI was more sensitive in detecting liver, bone, subcutaneous metastases, wb PET CT was more sensitive for N staging (2) , wb CT was more sensitive for secondary pulmonary lesions (3). DWI permits to detect 14 supplementary secondary lesions (20%) compared mc wb MRI without DWI.

DISCUSSION:

Mc whole body MRI is able to detect secondary lesions in advanced melanoma. Free-breathing and high b value whole body DWI improves the detection of malignant lesions by improving lesion conspicuity. These data suggests that wb DWI is required in oncologic wb MRI protocol in addition T2 w and T1 w sequences. Mc wb MRI with DWI was more sensitive and more specific than the PET CT in our study for especially for bone marrow, liver and subcutaneous metastases. For the N staging, PET CT seems to have more advantages. CT is more sensitive to detect pulmonary lesions.

REFERENCES:

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