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Comparison of PSMA-ligand PET/CT and multiparametric MRI for the detection of recurrent prostate cancer in the pelvis.

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PURPOSE: So far, there have been very few studies which provide a direct comparison between MRI and PSMA-ligand PET/CT for the detection of recurrent prostate cancer (rPC). This present study therefore aims to provide further clinical data in order to resolve this urgent clinical question, and thereby strengthen clinical recommendations.

METHODS: A retrospective analysis was performed for patients who were scanned at our institution with whole-body PSMA-PET/CT (tracer: 68Ga-PSMA-11) between January 2017 and September 2018 in order to detect rPC. Amongst them, 43 underwent an additional pelvic MRI within 2 months. Both modalities were compared as follows: a consensus read of the PET data was performed by two nuclear physicians. All lesions were recorded with respect to their type and localization. The same process was conducted by two radiologists for pelvic MRI. Thereafter, both modalities were directly compared for every patient and lesion.

RESULTS: Overall, 30/43 patients (69.8%) presented with a pathologic MRI and 38/43 (88.4%) with a pathologic PSMA-PET/CT of the pelvis. MRI detected 53 pelvic rPC lesions (13 of them classified as "uncertain") and PSMA-PET/CT detected 75 pelvic lesions (three classified as "uncertain"). The superiority of PSMA-PET/CT was statistically significant only if uncertain lesions were classified as false-positive.

CONCLUSIONS: PSMA-PET/CT detected more pelvic lesions characteristic for rPC when compared to MRI. In order to detect rPC, a potential future scenario could be conducting first a

PSMA-PET/CT. Combining the advantages of both modalities in hybrid PET/MRI scanners would be an ideal future scenario.

KEYWORDS: 68Ga-PSMA-11; MRI; PET/CT; PSMA; Prostate cancer; Prostate-Specific Membrane Antigen

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