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## A prospective, multicenter head-to-head comparative study in patients with primary high-risk prostate cancer investigating the diagnostic performance of conventional imaging and 18F-PSMA-PET/CT

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**Introduction & Objectives:** Prostate-specific membrane antigen (PSMA) positron emission tomography/computed tomography (PET/CT) is an emerging staging tool for patients with primary high-risk prostate cancer (PCa). Patients with primary metastatic disease are staged using PSMA-PET/CT imaging, while previously published randomized clinical trials relied on conventional imaging (i.e., bone scintigraphy (BS) results). The aim of this study was to determine the diagnostic accuracy of <sup>18</sup>F-PSMA-PET/CT versus BS for the detection of bone metastases in high-risk PCa patients.

**Materials & Methods:** 79 patients with high-risk PCa were prospectively staged using BS and subsequent <sup>18</sup>F-PSMA-PET/CT before initial therapy. Patients who presented with a BS showing no metastases represented Group 1, and patients with a BS showing low-volume disease according to the CHAARTED criteria (<4 bone metastases, no metastases outside vertebral column or pelvis and no visceral metastases) represented Group 2. Metastatic risk group according to CHAARTED and treatment strategies based on both imaging modalities were assessed.

**Results:** A change of CHAARTED risk group was observed in 9/70 (12.8%) of patients in Group 1. In Group 2, a change of risk group was found in 66.7% of patients, due to either upstaging (4/9 patients (44.4%)) and downstaging (2/9 patients (22.2%)). Treatment changes due to use of a different imaging modality occurred in almost 20% of patients.

**Conclusions:** In patients with negative for cancer results on conventional imaging, upstaging on modern imaging occurred only infrequently. Moreover, modern imaging resulted in both upstaging and downstaging in a substantial subset of patients with low-volume metastatic disease on conventional imaging. Treatment changes occurred in almost 20% of cases depending on imaging results.