

Supp. Table 1: Patient characteristics restaging cohort

Characteristics		⁶⁸Ga-PSMA-11	¹⁸F-rhPSMA-7
No. of Patients		127	127
Age at PET/CT, median± SD (range) in years		68±8 (47-83)	70±7 (52-84)
Biopsy Gleason Score	6-7	79	80
	8-10	48	47
Initial pathologic primary tumor stage (pT)	≤pT2	50	50
	≥pT3	77	77
Initial pathologic regional lymph node stage (pN)	pN0	95	95
	pN1	32	32
Additional ADT after radical prostatectomy		22	22
PSA-value (ng/ml) prior to PET/CT	Median	2.05	0.87
	(range)	(0.20-30.00)	(0.20-13.59)
	<0.5	48	48
	>0.5-1.0	40	40
	>1.0-2.0	17	17
	>2.0	22	22

ADT androgen deprivation therapy, STD standard deviation

Supp. Table 2: Patient characteristics primary staging cohort

Characteristics		⁶⁸Ga-PSMA-11	¹⁸F-rhPSMA-7
No. of Patients		33	33
Age at PET/CT, median± SD (range) in years		67±6 (56-75)	70±8 (52-83)
Biopsy Gleason Score	6-7	10	10
	8-10	23	23
PSA-value (ng/ml) prior to PET/CT	Median (range)	10.35 (3.80-81.56)	14 (1,37-81.00)
	<10	14	14
	>10-20	9	9
	>20-30	4	4
	>30	6	6

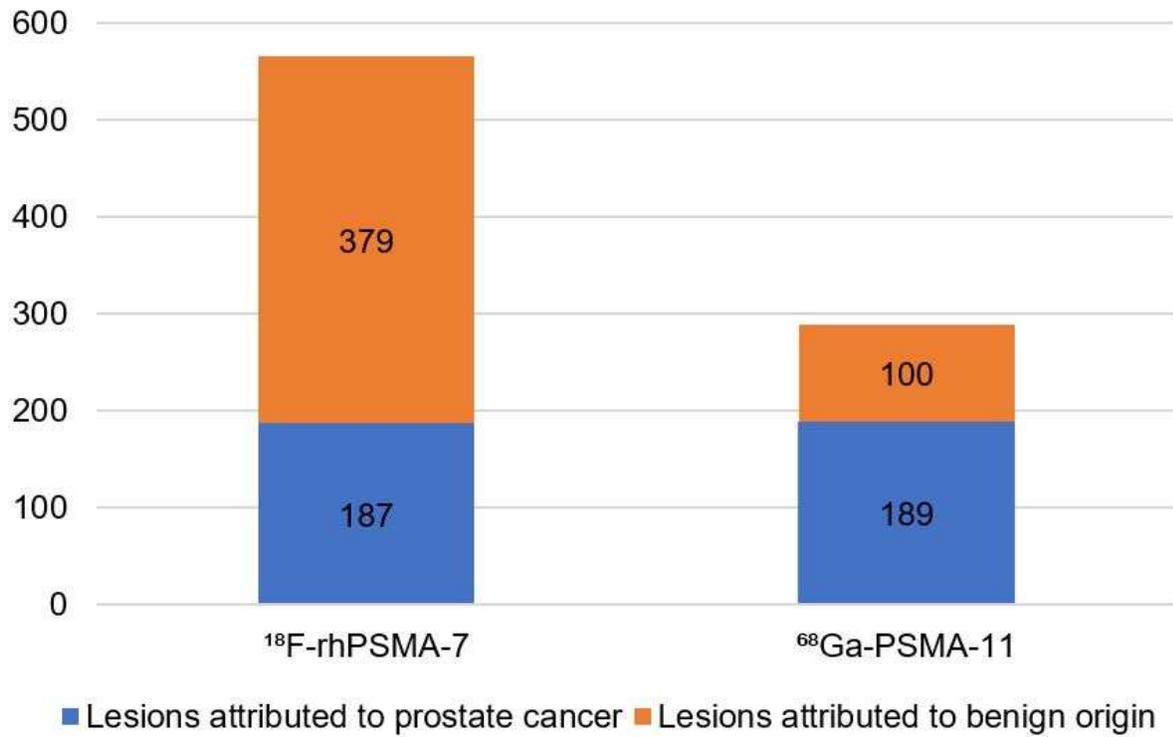
SD standard deviation

Supp. Table 3: Localization of unspecific uptake in bone lesions in ^{18}F -rhPSMA-7 PET and ^{68}Ga -PSMA-11 PET in both primary and recurrent disease

Localization	^{18}F-rhPSMA-7 PET/CT	^{68}Ga-PSMA-11 PET
Total no.	120	56
SUVmax (p=0.02)	6.1±2.9 (range 3.4-20.8*)	5.0±2.4 (range 2.4-12.4)
ribs	45	17
spine	43	20
pelvis	24	12
scapula	4	3
sternum	3	2
extremities	1	2

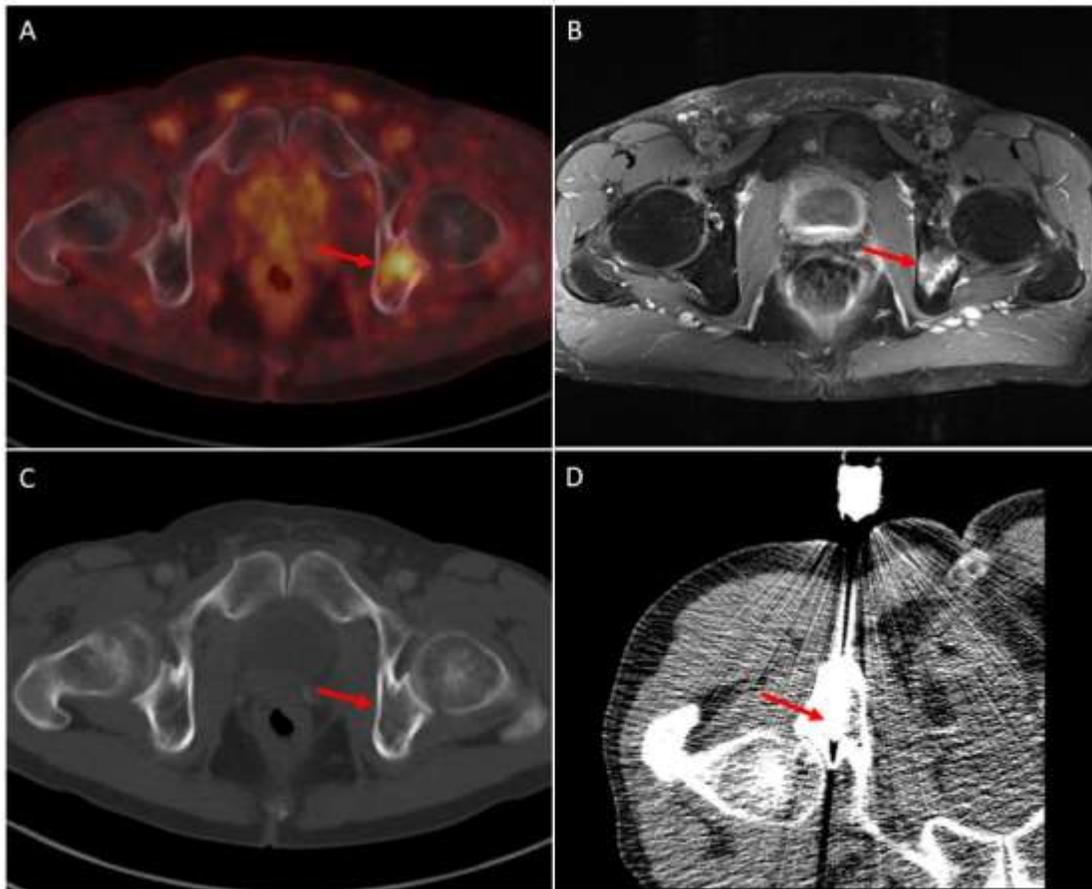
* patient presenting with partly focal, partly diffuse PSMA-ligand uptake in the left pelvis (SUVmax 20.8) due to M. Paget with typical findings on CT images including osteolysis, trabecular coarsening, cortical thickening, and osseous expansion

Supp. Figure 1



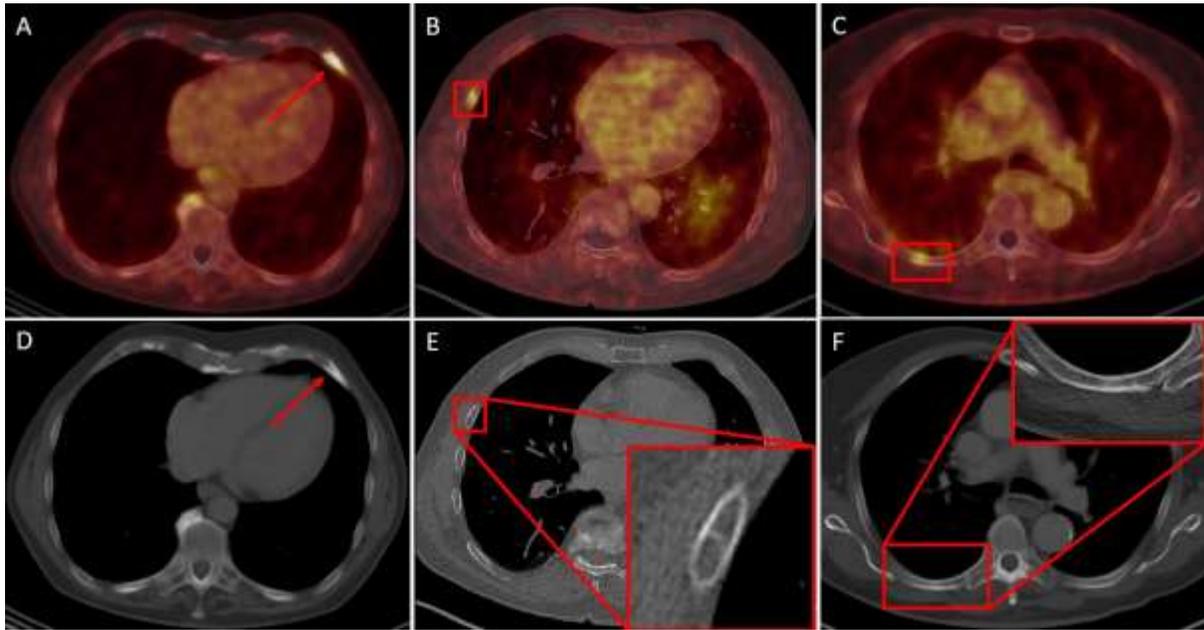
Total number of lesions with PSMA-ligand uptake attributed to prostate cancer and attributed to benign origin in both patient cohorts

Supp. Figure 2:



75-year-old patient (pT3a, pN0, GS 8, iPSA 58 ng/mL) with biochemical recurrence of prostate cancer (PSA level, 0.3 ng/mL) after radical prostatectomy presenting with a 18F-rhPSMA-7-positive suspicious bone lesion in the left ischial bone in fused 18F-rhPSMA-7 PET/CT (A). Corresponding T1 fat saturated MRI after gadolinium (B) shows a contrast-enhanced lesion and the corresponding CT present without any suspicious findings (C). Histopathologic evaluation after CT-guided biopsy of the left ischial bone (D) indicated bone tissue with vital spongy trabeculae, lipomatous bone marrow with only focal medullary fibrosis and discrete bone growing- and remodeling processes with no sign of malignancy.

Supp. Figure 3:



Three different patients with biochemical recurrence of prostate cancer after radical prostatectomy who underwent ^{18}F -rhPSMA-7 PET/CT:

A, D: ^{18}F -rhPSMA-7-ligand positive sclerotic bone metastasis in the left 5th rib (arrow) and a ^{18}F -rhPSMA-7-positive spondylophyte of the 10th thoracic vertebrae (dotted arrow).

B, E: ^{18}F -rhPSMA-7-positive fibro-osseous lesion with marginal sclerosis in the right 6th rib.

C, F: unspecific ^{18}F -rhPSMA-7 uptake in the right 6th rib with slight inhomogeneous bone structure, morphologically unchanged compared to CT images 2 years ago.