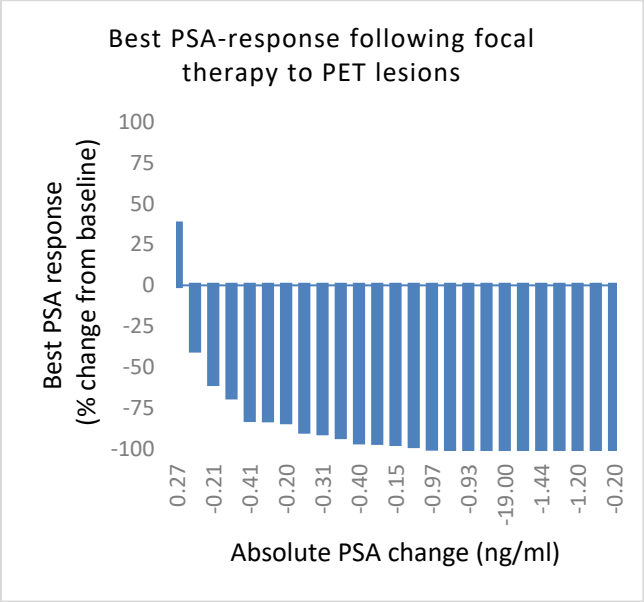
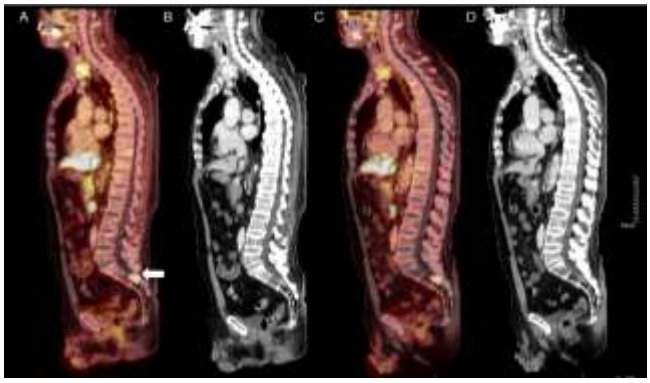
Supplemental FIGURE 1. Best PSA Response following focal therapy (EBRT) to ^{18}F-rhPSMA-7 PET.



Supplemental FIGURE 2. True positive intraspinal metastasis



Sagittal fused PET/CT (A), and CT (B) revealed focal ^{18}F-rhPSMA-7 uptake at a soft tissue lesion located at intraspinal sacrum level (arrow), representing intraspinal metastasis measured about 2.9 cm in long axis diameter. He received external beam radiation at this region up to a total dose of 37.5 Gy, VMAT technique supplemented by androgen-deprivation therapy, from August to September 2018. PSA was decreased from 1.44 ng/ml to 0.6 ng/ml after treatment. The follow up sagittal fused PET/CT (C), and CT (D) showed no significant change in size of aforementioned lesion, measured about 2.8 cm. This case was recorded as true positive according to significant PSA decreased (-58%) after targeted therapy.

Supplemental TABLE 1. Baseline characteristics of patients with PSA response following focal therapy (N = 25)

Characteristic	No. (%)
Age, median (range), years	71 (59-82)
Other prior therapy	
Local salvage therapy	1 (4)
ADT	1(4)
Multiple	2 (8)
Other	1 (4)
Not available / no prior treatment	20 (80)
Time between surgery and PSMA PET, median (range), years	2.3 (0-15)
<2.25	12 (48)
≥2.25	13 (52)
Primary T stage	
<T3	10 (40)
≥T3	14 (56)
Not available	1 (4)
Pathologic regional LN staging (pN)	
pN0	14 (56)
pN1	6 (24)
pNx	5 (20)
Gleason Score	
<8	17 (68)
≥8	3 (12)
Not available	5 (20)
PSA, median (range), months	5.98 (4-12)
dtPSA*, median (range), months	7.89 (2-33)
<6.8	3 (12)
≥6.8	4 (16)
Not available	18 (72)
PSA nadir after prostatectomy, median (range), ng/ml**	0.03 (0-19)
<0.1	6 (24)
≥0.1	4 (16)
Not available	15 (60)

Supplemental TABLE 2. Lesions validated as false positive by follow-up imaging per-region

Location	**Per-region (N=11)**	%	Criteria of false positive†
Prostate bed	2	18	In 3-12 months follow up; all PSMA-positive lesion which do not meet the following criteria; a) size decrease >30% with systemic / focal therapy, b) size increase >20% with/without systemic / focal therapy, and c) minimum size change of 3 mm is required. - Short axis diameter was used for lymph node lesion - Long axis diameter was used for lesions at prostate bed and visceral organs
Pelvic lymph node	6	55	
Extrapelvic lymph nodes/ Visceral organs	2	18	
Bone	1	9	Negative in additional bone scan or MRI

†According to UCLA/UCSF criteria follow up imaging / PSA response (Fendler et al. JAMA Oncol. 2019;5:856-863).

Supplemental TABLE 3. Lesions validated as false positive by follow-up imaging per-patient

Location	**Per-patient (N=10)**	**%**
Prostate bed only	1	10
Pelvic lymph node only	5	50
Extrapelvic lymph nodes/ Visceral organs only	2	20
Bone only	1	10
Prostate bed, and pelvic lymph node	1	10

Supplemental TABLE 4. Individual false positive lesions

Patient number	Lesion type	Treatment after PET	Explanation	Criteria	Time to follow up study, days (months)
	Prostate bed				
R233	Soft tissue after RPE	Systemic treatment (ADT)	Decreased size: 18%; 7 mm (38mm → 31 mm)	size decrease <30% after systemic therapy	263 (9)
R5	Soft tissue after RPE	Systemic treatment (ADT)	Decreased size: 12%; 2mm (17mm → 15 mm)	size decrease <30% after systemic therapy, and minimum size change < 3 mm	426 (14)
	Pelvic lymph node				
R5	Pelvic lymph node	Systemic treatment (ADT)	Decreased size: 41%; 1.5 mm (3.7 mm → 2.2. mm)	minimum size change < 3 mm	426 (14)
R200	Pelvic lymph node	No treatment	No size change: 0%; 0 mm (3.5 mm → 3.5 mm)	minimum size change < 3 mm	105 (4)
R550	Pelvic lymph node	No treatment	Increased size: 5%; 0.2 mm (4.1 mm → 4.3 mm)	size increase <20% without therapy, and minimum size change <3 mm	185 (6)
R773	Pelvic lymph node	No treatment	Increased size: 4%; 0.2 mm (4.7 mm → 4.9 mm)	size increase <20% without therapy, and minimum size change <3 mm	159 (5)
R789	Pelvic lymph node	Systemic	No size change:	minimum size	202 (7)

		treatment (ADT)	0%; 0 (13 mm → 13 mm)	change <3 mm	
R1184	Pelvic lymph node	No treatment	Decreased size: 6%; 0.5 mm (8.0 mm → 7.5 mm)	size increase <20% without therapy, and minimum size change < 3 mm	155 (5)
	Bone lesions				
R985	Bone	Systemic treatment (ADT)	Negative in additional MRI	Negative in additional bone scan or MRI	102 (3)
	Extrapelvic lymph nodes / visceral lesions				
R478	Retroperitoneal lymph node	No treatment	No size change: 0%; 0 mm (18 mm → 18 mm)	size increase <20% without therapy, and minimum size change < 3 mm	103 (3)
R524	Lung	No treatment	Increased size: 14%; 1 mm (7 mm → 8 mm)	size increase <20% without therapy, and minimum size change < 3 mm	117 (4)

Supplemental TABLE 5. Non-evaluable lesions on per-patient and per-region basis

Location	**Per-patient (N=7)**	%	**Per-region (N=8)**	%
Prostate bed	1	14	2	25
Pelvic lymph node	1	14	1	13
Visceral organs	0	0	0	0
Bone	4	58	5	62
>1 regions	1	14	0	0

Supplemental TABLE 6. Individual non-evaluable lesions

Patient number	Lesion type	Treatment after PET	Explanation	Time to follow/up study, days (months)
	Prostate bed			
R464	Soft tissue after RPE	Systemic treatment (ADT)	No reliably measurable lesion; lesion is adjacent to rectum	81 (3)
R990	Soft tissue after RPE	No treatment	No reliably measurable lesion; lesion is adjacent to rectum	195 (7)
	Pelvic lymph node			
R156	Pelvic lymph node	Systemic treatment (ADT)	No reliably measurable lesion; lesion is adjacent to iliac vein with similar density in CT	236 (8)
	Bone			
R344	Bone	EBRT (left 3rd rib, and pelvic region) with ADT	PSMA-positive lesion **without** corresponding sclerosis in baseline and follow up CT	364 (12)
R158	Bone	Systemic treatment (ADT)	PSMA-positive lesion **without** corresponding sclerosis in baseline and follow up CT	329 (11)
R464	Bone	Systemic treatment (ADT)	PSMA-positive lesion **without** corresponding sclerosis in baseline and follow up CT	81 (3)
R582	Bone	Systemic treatment (ADT)	PSMA-positive lesion **without** corresponding sclerosis in baseline and follow up CT	238 (8)
R969	Bone	No treatment	PSMA-positive lesion **without** corresponding sclerosis in baseline and follow up CT	152 (5)