Abstract #5009: Cohort study of oligorecurrent prostate cancer (PCa) patients: Oncological outcomes of patients treated with salvage lymph node dissection (SLND) via PSMA radioguided surgery (PSMA-RGS)

Sophie Knipper[1], Mehrdad Mehdi Irai[1], Ricarda Simon[2], Daniel Köhler[3], Isabel Rauscher[4], Matthias Eiber[4], Fijs W.B. van Leeuwen[5], Pim van Leeuwen[6], Lars Budäus[1], Thomas Steuber[1,7], Markus Graefen[1], Pierre Tennstedt[1], Matthias M. Heck[2], Thomas Horn[2], Tobias Maurer[1,7]

[1] Martini-Klinik Prostate Cancer Center, University Hospital Hamburg-Eppendorf, Hamburg, Germany; [2] Department of Urology, Technical University of Munich, Munich, Germany; [3] Department of Radiology and Nuclear Medicine, University Hospital Hamburg-Eppendorf, Hamburg, Germany, [4] Department of Nuclear Medicine, Technical University of Munich, Munich, Germany; [5] Interventional Molecular Imaging Laboratory, Department of Radiology, Leiden University Medical Center, Leiden, The Netherlands

[6] Department of Urology, Antoni van Leeuwenhoek Hospital – the Netherlands Cancer Institute, Amsterdam, the Netherlands; [7] Department of Urology, University Hospital Hamburg-Eppendorf, Hamburg, Germany

BACKGROUND

- Prostate-specific membrane antigen (PSMA) positron-emission tomography (PET) allows detection of small and/or atypically localized metastatic prostate cancer (PCa) lesions
- Evaluation of oncological outcomes and potential predictive preoperative factors for improved outcomes of salvage PSMA-radioguided surgery (RGS) for oligorecurrent PCa

METHODS

- Cohort (n=364) with biochemical recurrence (BCR) after radical prostatectomy (RP) and imaging with PSMA PET receiving salvage PSMA-RGS between 2014 and 2020 in two centers
- Kaplan-Meier and multivariable Cox regression models adjusted for various parameters to test for BCR-free survival (BFS) and therapy-free survival (TFS) differences
- Postoperative complications according to Clavien-Dindo

RESULTS

- N= 364 patients with median (IQR) age of 67 (61-71) years and preoperative PSA of 1.0 (0.5-1.9) ng/ml at PSMA-RGS
- Removal of metastatic soft-tissue lesions in 356 (94.4%) patients
- Within three months from surgery, 25 (6.6%) patients suffered from Clavien-Dindo complications grade III-IV
- During follow-up, 235 patients experienced BCR and 129 patients received further therapy
- Median (IQR) BFS and TFS was 7.8 (5.4-10.9) and 34.9 (24.7-43.5) months
- At two years of follow-up, BFS rate was 31.9% and TFS rate was 56.6%
- Higher preoperative PSA (HR: 1.06), higher number of PSMA-avid lesions on preoperative imaging (HR: 1.2) and multiple (pelvic plus retroperitoneal) localizations (HR: 1.7), as well as retroperitoneal localization (HR: 2.0) of lesions in PSMA PET imaging were independent predictors of BCR after PSMA-RGS in multivariable analyses
- Limitations: retrospective design and lack of a control group

CONCLUSIONS

- Salvage surgery in oligorecurrent PCa currently constitutes an experimental treatment approach. Thus, careful patient selection is mandatory based on life expectancy, low PSA values and low number of PSMA PET avid lesions located in the pelvis
- Further studies are needed to confirm our findings and define the oncological value of salvage surgical procedures in oligorecurrent PCa

Crucial for salvage surgery (PSMA-RGS) in PCa:

Careful patient selection based on low PSA values and low number of PSMA PET avid lesions located in the pelvis

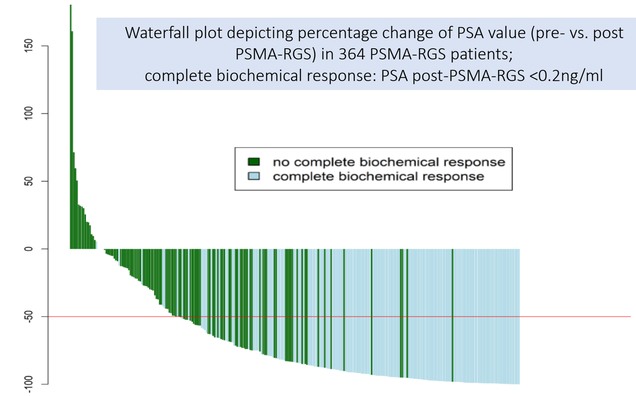
Correspondance: Tobias Maurer, t.maurer@uke.de or Sophie Knipper @sophieknipper

SCAN ME SCAN ME

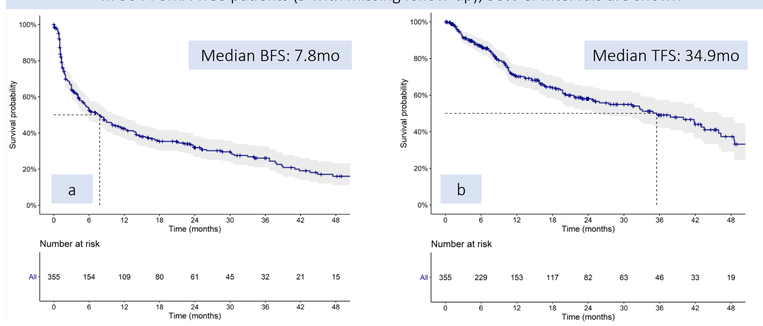
Characteristics	N = 364 Median (IQR); n (%)
Year of initial RP	2014 (2010, 2016)
PSA at RP, ng/ml	9 (6, 16)
pT stage at RP	
pT2	145 (40.0%)
pT3a	105 (29.0%)
pT3b	107 (29.0%)
NA	7 (1.9%)
Gleason grade group	
I	27 (7.4%)
II	96 (26.0%)
III	127 (35.0%)
IV	40 (11.0%)
V	60 (16.0%)
NA	14 (3.8%)
pN stage at RP	
pN0	276 (76.0%)
pN1	60 (16.0%)
pNX	18 (4.9%)
NA	10 (2.7%)
Lymph node yield at RP	13 (7, 20)
No. of positive lymph nodes at RP	
0	276 (76.0%)
1	31 (8.5%)
2	15 (4.1%)
3	9 (2.5%)
4	3 (0.8%)
Unknown	30 (8.3%)
Surgical margin status	
R0	266 (73%)
R1	72 (20%)
RX	11 (3.0%)
NA	15 (4.1%)
Radiotherapy (RT) post RP	
No RT	140 (38.0%)
RT post RP	224 (62.0%)

Characteristics	N = 364 Median (IQR); n (%)
Age at PSMA-RGS, years	67 (62, 71)
Time between RP and PSMA-RGS, months	54 (28, 93)
PSA prior to PSMA-RGS, ng/ml	1.0 (0.5, 1.9)
No. of PSMA PET avid lesions	
0	6 (1.6%)
1	241 (66.0%)
2	76 (21.0%)
3	24 (6.6%)
4	12 (3.3%)
5	4 (1.1%)
6	1 (0.3%)
PSMA PET localization	
Pelvic unilateral	154 (42.0%)
Pelvic bilateral	12 (3.3%)
Pelvic plus presacral or retrovesical	32 (8.8%)
Presacral/ pararectal	48 (13.0%)
Retrovesical/ paravesical	54 (15.0%)
Retroperitoneal	28 (7.7%)
Retroperitoneal plus other localization	27 (7.4%)
Intraabdominal	3 (0.8%)
None	6 (1.6%)
No. of pathologically positive lesions	
0	21 (5.8%)
1	145 (40.0%)
2	69 (19.0%)
3	34 (9.3%)
4	24 (6.6%)
5	15 (4.1%)
≥ 6	56 (15.0%)
Postoperative complications (Clavien-Dindo)	
I	81 (22.3%)
II	13 (3.6%)
IIIa	8 (2.2%)
IIIb	15 (4.1%)
IVa	0
IVb	1 (0.3%)
V	0

Waterfall plot depicting percentage change of PSA value (pre- vs. post PSMA-RGS) in 364 PSMA-RGS patients;
complete biochemical response: PSA post-PSMA-RGS <0.2ng/ml



Kaplan-Meier analysis depicting BCR-free survival (a) and therapy-free survival (b) rates in 364 PSMA-RGS patients (9 with missing follow-up); 95% CI-intervals are shown



	Univariable Cox regression model				Multivariable Cox regression model			
Variables	HR	CI 2.5%	CI 97.5%	p-value	HR	CI 2.5%	CI 97.5%	p-value
Age at surgery (continuous)	1.0	0.98	1.01	0.5				
Gleason Grade Group at RP								
I-II	Ref.							
III-V	1.08	0.81	1.43	0.6				
RT post RP								
No	Ref.							
Yes	1.17	0.89	1.54	0.3				
Time RP to PSMA-RGS (continuous)	1.0	1.0	1.0	0.7				
PSA prior to PSMA-RGS (continuous)*	1.06	1.02	1.11	0.009	1.07	1.02	1.12	0.009
No. of PSMA PET positive lesions (continuous)*	1.24	1.09	1.42	0.001	1.23	1.08	1.40	0.002
Localization of PSMA PET positive lesions*								
Pelvic	Ref.							
Retroperitoneal and pelvic	2.02	1.30	3.13	0.002	1.90	1.23	2.95	0.004
Retroperitoneal only	2.02	1.30	3.16	0.002	2.04	1.31	3.18	0.002

Uni- and multivariable Cox regression models predicting BCR-free survival. *tested in two independent multivariable Cox regression models: PSA with number (No.) of PSMA PET positive lesions as well as PSA with localization of PSMA PET positive lesions.