

The impact of PSMA PET/CT on oncologic outcomes of patients with recurrent prostate cancer: The experience of 3 high-volume European centers

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Introduction & Objectives: PSMA PET/CT is currently the best tool for staging prostate cancer (PCa) patients after radical treatments due to higher diagnostic accuracy compared to conventional imaging, turning it into a promising guide for PSMA-targeted treatments. The objective of this study is to evaluate the oncological outcomes of recurrent PCa patients according to PSMA PET/CT results.

Materials & Methods: We retrospectively evaluated 324 recurrent PCa patients after radical prostatectomy performed at three high-volume European centers between January 1998 and January 2021. Patients underwent PSMA PET/CT for restaging proposal after biochemical recurrence (BCR) and were stratified in two groups according to PSMA PET/CT results (positive vs negative). Patients with positive PSMA PET/CT for oligometastatic (≤ 3 lesions) underwent PSMA-targeted salvage treatment. Patients with positive PSMA PET/CT for polimetastatic (>3 lesions) underwent systemic therapy. Patients with negative PSMA PET/CT were treated with non-imaging guided salvage therapy. Kaplan-Meier (KM) curves were plotted to evaluate differences in progression-free survival (PFS), radiologic PFS (rPFS), metastases free survival (MFS) and castration resistant prostate cancer free survival (CRPC-FS). Multivariate Cox regressions were performed to identify independent predictors of PFS and rPFS.

Results: Overall, 193 patients (group 1) and 131 patients (group 2) had positive and negative PSMA PET/CT, respectively. Patients in group 1 had higher pT ≥ 3 , pN1, ISUP ≥ 4 and PSA at PSMA PET/CT (0.7 vs 0.4) compared to patients in group 2 (all p ≤ 0.03). After salvage treatments, no significant differences were recorded in terms of further clinic recurrence sites, PSA at BCR, time to BCR, overall mortality and cancer specific mortality. At median follow-up of 23 months, survival analyses at KM curves depicted significantly lower PFS (53 vs 80%), rPFS (62 vs 89%), MFS (77 vs 94%) and CRPC-FS (91 vs 97%) for patients in group 1 compared to patients in group 2 (all p ≤ 0.006). At multivariate Cox regression, positive PSMA PET/CT (HR=2), patients' age (HR=0.97) and pT $\geq 3b$ (HR=1.84) were independent predictors of PFS (all p ≤ 0.02); positive PSMA PET/CT (HR 2.64) and patients' age (HR=0.95) were independent predictors of rPFS (all p ≤ 0.002).

Conclusions: Patients with positive PSMA PET/CT had worse oncologic outcomes in terms of PFS, rPFS, MFS and onset of CRPC status compared to men with negative PSMA PET/CT. Thus, PSMA PET/CT for restaging PCa still have an important role for patients' prognosis counseling and salvage treatment plan.