Abstract Title: The effect of staging with $^{68}$Ga-PSMA PET/CT imaging on clinical decision for treatment protocol of high risk prostate cancer patients

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Introduction: PSMA staging in high risk prostate cancer patients (Gleason score >7, PSA >20 ng/mL, clinical stage T2c – 3a) with $^{68}$Ga-PSMA PET/CT is useful for detecting metastatic disease especially valuable for oligometastatic disease. It has shown to change the treatment protocol in patients with BCR however there is still less data with the patients for recent diagnosed prostate cancer or staging.

Methods: Recently diagnosed prostate cancer patients suspected with metastatic disease, additionally patients with findings either Gleason score of higher than 7 or higher PSA values were included to our study. 57 patients with prostate cancer were scanned for staging. Between 3,6-5,5 mCi $^{68}$Ga-PSMA was injected. Patients were scanned 60 minutes after injection. Two urologists were evaluated patients separately for the treatment decision before and after they receive PSMA PET/CT reports.

Findings: Patient ages were between 36-86 and mean PSA value was 152 (4,1-1957 ng/ml). All GS scores higher than 7; except 7 patients who had PSA values of >20ng/ml. 45% of the patients had positive findings for lymph node metastases, 28% of the patients had distant metastasis. Between 41% and 50% changing rates were calculated for the treatment protocols. PET/CT scan changed the stage in 35% of our patients in the group. Radical prostatectomy was the most chosen treatment protocol (33,8%) in patients before evaluation of PSMA images. Similarly, radical prostatectomy has shown to be most chosen treatment protocol (35,4%) even after evaluation with PSMA PET/CT images. Hormone therapy with chemotherapy was chosen by 29,2% and 27,7% before and after PSMA PET/CT images respectively.

Conclusion: Several studies are already revealed the use of $^{68}$Ga-PSMA PET/CT in prostate cancer with the suspect of biochemical recurrence. However there is a still debate about the use of PSMA imaging in staging prostate cancer patients. The patient in our series showed the contribution of PSMA imaging is not negligible with the change rates of 41-50% in treatment protocol.

Figure 1. A high risk 72 year-old patient with positive findings for lymph node metastases PSA level of 117 µg/L, Gleason score of 4+5

Figure 2. The youngest patient in our study group with age of 36, demonstrated multiple bone metastases and PSA levels of 284 µg/L, Gleason score was 4+5