

⁶⁸Ga-PSMA-11 in Intermediate to High-Risk Prostatectomy Patients

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Background: The Prostate Specific Membrane Antigen (PSMA) is expressed on the majority of prostate cancer cells. PET imaging targeting PSMA has demonstrated increased sensitivity for disease compared to conventional imaging and choline PET. We aimed to evaluate the sensitivity and specificity of ⁶⁸Ga-PSMA-11 for regional nodal metastases in intermediate to high-risk prostatectomy patients.

Methods: This study was approved by the local Institutional Review Board and all patients signed informed consent. Inclusion criteria for prostatectomy patients were: CAPRA (Cancer of the Prostate Risk Assessment) score ≥ 5 , PSA ≥ 15 ng/mL and/or Gleason score $\geq 4+4$. Patients were injected with 3-7 mCi of ⁶⁸Ga-PSMA-11, and imaged 55-70 minutes later using PET/CT or PET/MRI. Patients were followed to determine pathologic outcome at prostatectomy.

Results: 64 intermediate to high-risk prostatectomy patients were imaged as part of this protocol to date. 33 patients were imaged on PET/MRI and 31 patients using PET/CT. The average age was 66 ± 8 years and an average PSA of 25.3 ± 60.8 . Gleason score at biopsy prior to imaging was 5+5 in five patients, 5+4 in 4, 4+5 in 21, 4+4 in 11, 4+3 in 15, 3+4 in 3, and 3+3 in 3. On PSMA PET, the primary tumor was detected in 63 of 64 patients. Nodal metastases were seen in 25 patients, osseous metastases in 6 patients and no visceral metastases were visualized. To date, 30 patients have undergone prostatectomy. Using pathology as a gold standard at prostatectomy, 10 patients had true positive nodes, 3 had false negative nodes, and 17 had true negative nodes, resulting in a sensitivity of 77% and specificity of 100%. One patient had positive nodes seen on PSMA PET on the contralateral side to where they were reported on pathology, otherwise all nodes correlated by location between PET and pathology. 23 patients have had repeat PSAs after prostatectomy: all six patients with positive nodes, who have had repeat PSAs, have demonstrated positive PSAs after surgery. Of the 17 patients with no evidence of nodes on pathology or imaging, 10 of the 17 patients had a negative PSA after prostatectomy.

Conclusions: Preliminary data from our prostatectomy population supports the use of PSMA PET for the detection of nodal metastases in intermediate to high-risk patients prior to prostatectomy. Given the high percentage of patients with persistent PSAs after prostatectomy in patients with positive disease on PSMA PET, it is important to better understand the appropriate management of patients with positive nodal disease prior to prostatectomy.

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