

PET Imaging of Prostate Cancer with C-11 Acetate: A Pilot Study

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The long-term goal of this project is improved imaging of prostate cancer by positron emission tomography (PET) with use of the radiopharmaceutical C-11 acetate. A successful effort would lead to more accurate pre-operative staging and better diagnosis of recurrence in patients with prostate cancer. This pilot study is designed to generate data to begin to evaluate the effectiveness of C-11 acetate, focusing on patients with recurrent or persistent disease after prostatectomy or radiation therapy. If this work is successful, outside funding will be sought to pursue the long-term goal in a much larger group of patients. Three specific questions will be addressed: 1. What is the yield of PET with C-11 acetate in detecting disease in this patient population? 2. How does the performance of PET with C-11 acetate compare with that of PET using F-18 fluorodeoxyglucose (FDG-PET) and with that of CT? 3. What is the optimal imaging protocol in terms of imaging time after injection and the use of static images versus dynamic clearance rates?

Eligibility criteria

Two groups of patients will be studied – those who have recurrent disease manifested by a detectable prostate-specific antigen (PSA) following radical prostatectomy (Group A), and patients who have failed radiation therapy as the primary treatment for their disease (Group B).

Group A. Post-operative PSA recurrence

1. Pre-operative PSA greater than 10 ng/ml
 2. Gleason score of 7 or greater at prostatectomy
 3. Detectable post-operative PSA
- and any one of the following:
- a. Positive tumor margin at surgery
 - b. Seminal vesicle involvement by tumor
 - c. Extra-capsular extension of tumor
 - d. Involvement of 25% or more of the prostate by tumor
 - e. Positive nodes at surgery

Group B. Radiation therapy treatment failure

1. Prior radiation therapy for prostate cancer
 2. Rising PSA based on three consecutive measurements
- and either of the following:
- a. Pre-treatment PSA greater than 10 ng/ml
 - b. Gleason score of 7 or greater at original diagnostic biopsy