

¹¹C-Acetate PET/CT Imaging of Prostate Cancer Lymph Node Metastases and Correlation with Lymphadenectomy and Histopathology Findings

Introduction and Objectives: The choice of treatment in patients with prostate cancer is often determined by the existence of tumor spread to regional lymph nodes. In this study, we evaluated PET/CT with ¹¹C-acetate to detect regional lymph node metastases with strict correlation to surgical and histopathological results.

Materials and Methods: The study comprised of 19 patients. In 8 cases lymph node sites were explored in connection with retropubic prostatectomy. In one subject lymphadenectomy was carried out before radiation therapy. Ten cases which previously underwent prostatectomy had biochemical recurrence and positive lymph nodes on ¹¹C-Acetate PET/CT Imaging. According to our study protocol these patients underwent subsequent lymphadenectomy within two months. Mean pre-operative PSA was 25.1 (range 0.1-130 ng/ml). All 19 patients had undergone ¹¹C-acetate-PET/CT imaging. 14 cases indicated lymph node metastases and were therefore planned for surgery. Five PET/CT negative patients were also included for surgery, 3 because of high PSA (16, 50 and 130ng/ml), one had a poorly differentiated tumor (Gleason 9) and one had rapid tumor increase on repeated biopsies. A postoperative PET/CT was performed 3 months after surgery in all patients.

Results: Ten patients were positive for lymph node metastases on histopathology. For each patient a mean of 25 (range 8-50) lymph nodes were obtained at surgery. A total of 478 lymph-nodes were examined by the pathologists and 44 of these were positive for malignancy. Good correlation between ¹¹C-acetate-PET/CT report and histopathology was seen in 15 cases resulting in 90% sensitivity and 67% specificity. In postoperative controls progression was suspected in 4 cases on ¹¹C-acetate-PET/CT imaging.

Conclusion: ¹¹C-acetate PET/CT imaging in this limited material had a high sensitivity but lower specificity. Further clinical research on the use of ¹¹C-acetate-PET/CT with optimizing scanning time and equipment may allow further improvement.