

## ***Case Report:*** **PET Scan Detects Prostate Cancer in a Patient with Hodgkins Lymphoma**

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**Abstract.** Positron emission tomography (PET) is routinely used in the management of cancers such as lung, colorectal, esophageal, breast, lymphoma, and melanoma. In urologic oncology, the role of PET has been less well defined and is currently under investigation. We report the first case of PET scan detection of prostate cancer in a patient with Hodgkins lymphoma. (*received 25 April 2003, accepted 15 May 2003*)

**Keywords:** prostate carcinoma, Hodgkins lymphoma, positron emission tomography

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### **Case History**

A 46-yr-old man with Hodgkin's lymphoma, with bilateral axillary nodal disease, received chemotherapy and radiation therapy. Post-treatment computed tomography (CT) and positron emission tomography (PET) showed a complete response. Two years later, he presented with complaints of fatigue, fever, night sweats, and bone pain. Physical examination was significant only for a sub-centimeter left axillary lymph node. CT and PET were performed to search for recurrent disease.

The CT was unchanged, but the PET scan revealed an abnormal area of increased glucose metabolism in the left apex of the prostate (Fig. 1). The patient had no urinary symptoms; genitourinary examination, including digital rectal examination, was unremarkable. Transrectal ultrasound examination with prostate needle biopsies were then performed.

Biopsy revealed prostatic adenocarcinoma in the left prostatic apex (Fig. 2). Radical retropubic prostatectomy and lymph node dissection were performed, revealing prostatic adenocarcinoma,

Gleason Score 6 (3+3). The tumor presented predominantly as a small nodule in the left apex, with two separate microscopic foci within the right apex. There was no evidence of perineural or vascular invasion. All of the surgical margins were free of tumor.

### **Discussion**

2-Deoxy-2-[<sup>18</sup>F]fluoro-D-glucose (FDG)-PET is routinely used in clinical practice to evaluate various cancers, including lung, colorectal, esophageal, breast, lymphoma, and melanoma [1]. However, in urologic oncology, the role of PET is less well defined and is currently an area of investigation.

Use of FDG-PET has been disappointing in the diagnosis of localized prostate cancer, probably because most prostate cancers have a relatively low glycolytic rate [1]. In addition, because the radiotracer is eliminated in the urine, the presence of FDG in the ureters and bladder can compromise the evaluation of adjacent structures [1]. However, studies have shown FDG-PET to be helpful in staging established cases of prostate cancer and in pre-operative evaluation of lymph node metastases [1,2]. Recent studies have used <sup>11</sup>C-choline as the radiotracer, since it has minimal urinary excretion. This tracer has been successfully employed to identify

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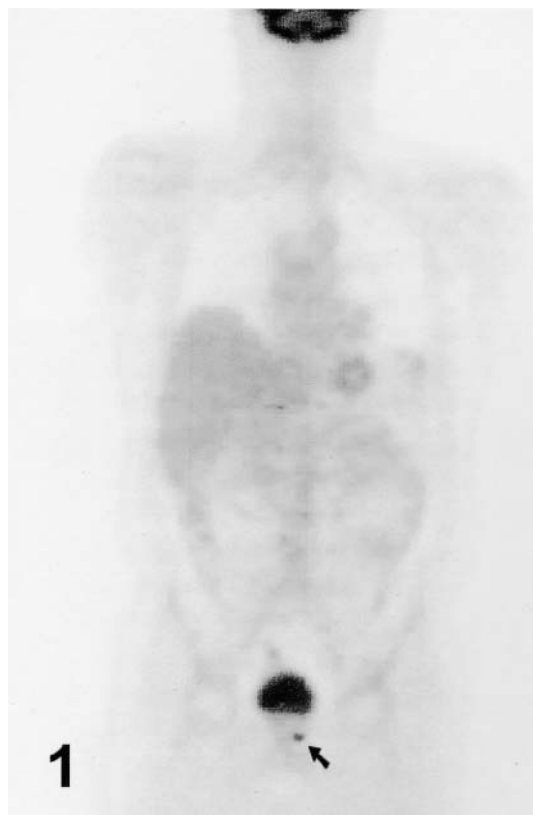


Fig. 1. PET scan shows an area of increased glucose metabolism in the left apex of the prostate (arrow).

locally extensive and metastatic prostate cancer, but is inconvenient for general use in clinical practice because of the short half-life of  $^{11}\text{C}$ , which requires on-site radiotracer production [1]. New radiotracers are being developed, such as  $^{18}\text{F}$ -fluoroethylcholine, which may overcome this limitation [2].

Studies have shown that changes seen on PET scans correlate with changes in prostate specific antigen (PSA) levels, and may help guide therapeutic decision making [1]. Since salvage radiation therapy may be more effective if applied early (before the serum PSA level reaches 1 ng/ml), the possible use of PET scan as a diagnostic tool for early detection of disseminated or recurrent prostate cancer is encouraging [3]. Advances in PET imaging will undoubtedly improve the clinical evaluation and treatment of prostate cancer.

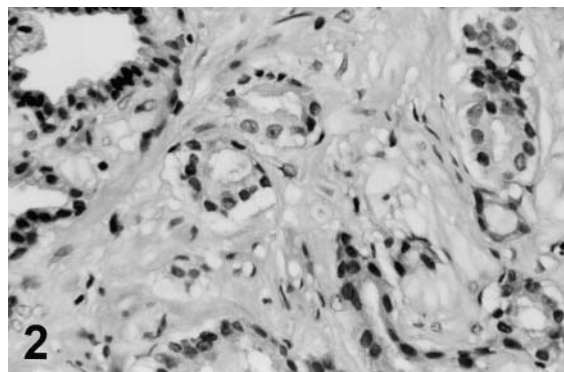


Fig. 2. Adenocarcinoma in needle biopsy of the left apex of the prostate (H&E, x 100 magnification).

Our case demonstrated a prostate cancer that was diagnosed incidentally during PET imaging for Hodgkins lymphoma. The prostate cancer was organ-confined and occupied <5% of the sampled parenchyma. Early diagnosis and treatment of this patient's tumor certainly improved his overall prognosis. We envision that imaging modalities will continue to improve and give other patients a better chance for early detection of prostatic carcinoma.

## References

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