

---

---

## CASE REPORT

---

---

# A Case of Seminal Vesicle / Prostatic Reflux Causing Intense Focal Fluorodeoxyglucose Uptake in the Prostate Gland

WH Ma<sup>1</sup>, EYP Lee<sup>2</sup>, ASH Lai<sup>3</sup>, PL Khong<sup>2</sup>

<sup>1</sup>Nuclear Medicine Unit, Department of Radiology, Queen Mary Hospital; <sup>2</sup>Department of Radiology, The University of Hong Kong; <sup>3</sup>Department of Radiology, Queen Mary Hospital, Pokfulam, Hong Kong

### ABSTRACT

We report an interesting case of benign persistent intense focal fluorodeoxyglucose (FDG) activity in the prostate gland. A 66-year-old man with a history of prostatism and benign prostate hypertrophy presented with elevated prostate-specific antigen. Three prostatic biopsies obtained by transrectal ultrasonography (TRUS) were negative for malignancy. Magnetic resonance imaging of the prostate revealed a hypointense signal at the right prostate base on T2-weighted images. FDG positron emission tomography/computed tomography (CT) was performed for further evaluation and demonstrated intense FDG activity, similar to urine, posterior to the prostate. Delayed CT scan showed serpiginous excretion of contrast into the seminal vesicles and peripheral zone of the prostate, corresponding to areas of intense and persistent FDG activity, compatible with seminal vesicle and prostatic reflux of urine resulting in intense FDG uptake. Awareness of this pathological entity that may be a complication of TRUS or due to chronic prostatitis may avoid misinterpretation, especially in the absence of administration of CT contrast to delineate the prostatic ducts.

**Key Words:** Fluorodeoxyglucose F18; Positron-emission tomography; Prostatic neoplasms; Seminal vesicles; Tomography, X-ray computed

## 中文摘要

### 精囊 / 前列腺回流引致前列腺的FDG強烈攝取

馬慧嫻、李燕蘋、黎紹豪、孔碧蘭

本文報告有關前列腺出現持續FDG強烈攝取的一個有趣病例。一名曾有前列腺炎和前列腺增生症病史的66歲男性病發時出現前列腺特異抗原水平升高。經直腸超聲檢（TRUS）進行的惡性腫瘤檢查所得的三個前列腺活檢均呈陰性。前列腺磁共振成像顯示T2加權圖像的右側前列腺基地呈低信號。FDG正電子發射斷層成像 / 電腦斷層掃描（CT）顯示前列腺後方有類似尿液的FDG強烈攝取。延遲CT顯示有匍行狀的造影劑流入精囊和前列腺的外週帶，與FDG強烈攝取區域相對應，可以解釋精囊和尿回流而產生的FDG強烈攝取。這可能是由於TRUS誘發的併發症或者慢性前列腺炎所致。了解這種病理情況可避免誤診，尤其是當未進行CT造影檢查前列腺導管時。

---

---

**Correspondence:** Dr WH Ma, 3/F Cancer Centre, Nuclear Medicine Unit, Department of Radiology, Queen Mary Hospital, Pokfulam, Hong Kong.  
Email: mawb@ha.org.hk

Submitted: 2 Jun 2015; Accepted: 23 Jul 2015.

## INTRODUCTION

Prostatic duct / seminal vesicle reflux is commonly seen as a consequence of ductal stenosis or obstruction. It may be benign or associated with an increased incidence of prostatitis. To the best of our knowledge, our case report is the first to show that seminal vesicle / prostatic reflux can cause persistent intense focal fluorodeoxyglucose (FDG) activity. Informed consent was obtained from the patient for the retrospective investigation.

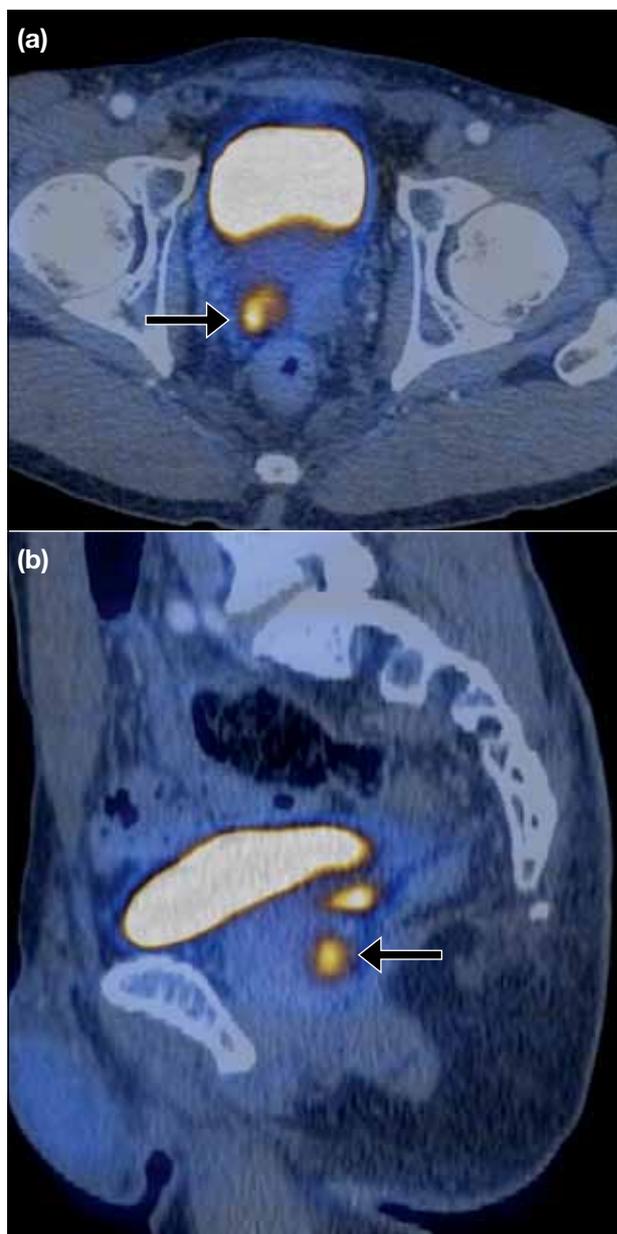
## CASE REPORT

We report the case of a 66-year-old man with a history of prostatism who had experienced weak stream, hesitancy, and nocturia for several years. He was prescribed combination therapy with finasteride and alfuzosin for benign prostate hypertrophy in August 2014. His serum prostate-specific antigen level was elevated (11.5 ng/ml). Over the last 2 years, three prostatic biopsies obtained by untargeted transrectal ultrasonography (TRUS) had been negative for malignancy. In addition, his second TRUS was complicated by right epididymo-orchitis. A magnetic resonance imaging (MRI) of the prostate revealed a suspicious hypointense signal at the right prostate base on T2-weighted images (Figure 1), but the patient refused to undergo repeated targeted biopsy. In addition to MRI, FDG positron emission tomography/computed tomography (PET/CT) was performed for further evaluation and demonstrated intense FDG activity posterior to the prostate and corresponding to the right

seminal vesicle. The intensity was similar to that of the urinary activity with a maximum standardised uptake value of 14.0 (Figure 2). Subsequent delayed CT scan was performed 2 hours following injection of 348 MBq (9.4 mCi)  $^{18}\text{F}$ -FDG. The CT images showed serpiginous excretion of contrast into the seminal vesicles and peripheral zone of the prostate, corresponding to the areas of intense and persistent FDG activity, compatible with seminal vesicle and prostatic reflux of urine



**Figure 1.** Transaxial T2-weighted image shows low-signal-intensity lesion (arrow) at the right-base peripheral zone of the prostate.



**Figure 2.** (a) Transaxial-fused and (b) sagittal-fused fluorodeoxyglucose (FDG) positron emission tomography/computed tomography images show intense FDG uptake posterior to the prostate (arrows).



**Figure 3.** Delayed transaxial computed tomography image shows excretion of contrast in the seminal vesicles and peripheral zone of the prostate (arrow).

resulting in intense prostatic FDG uptake (Figure 3). This case illustrates a variant causing unusual intense activity in the prostate gland.

## DISCUSSION

<sup>18</sup>F FDG PET/CT is not the standard imaging protocol for prostatic neoplasm. The sensitivity of FDG PET/CT in the detection of primary tumour is low, ranging from 19% to 64%.<sup>1</sup> C-11 choline and F-18 fluoride are better options to detect regional lymph node and distant bony metastases, respectively. Nevertheless, FDG PET/CT is occasionally used for oncological imaging in patients with prostate cancer. Some literature reviews have shown that the incidence of occult prostate cancer with focal uptake is not low.<sup>2,3</sup>

The intense FDG activity posterior to the prostate may be mistaken for an indication of malignancy if one is not familiar with other disease entities. False-positive results may occur due to prostatitis, benign prostate hypertrophy, physiological uptake in the collecting system as FDG is excreted into the bladder and urethra, or seminal vesicle / prostatic reflux as illustrated in

this case. The anatomical information provided by CT allows proper assessment and characterisation of the suspected lesion. Administration of diuretics and even contrast material can improve visualisation of the lesion and may help in making a differential diagnosis.

Seminal vesicle / prostatic reflux is occasionally seen in radiology examinations. Anatomically, the seminal vesicles develop from the distal mesonephric duct. They are about 6 cm in length and 5 cm in diameter. At the terminal portion of the vas deferens within the prostate, the major lumen of the seminal vesicle empties into the ejaculatory duct. Possible aetiologies of seminal vesicle / prostatic reflux include: obstruction (stones, urethral valve), inflammatory disease, complication following resection, and voiding dysfunction. It can also occur in normal individuals. Most cases may present with pain, fever, recurrent epididymitis-prostatitis or post-voiding dribbling. The management of seminal vesicle / prostatic reflux depends on the underlying conditions.<sup>4-6</sup>

Awareness of this pathological entity, which may be a sequel of TRUS complication or chronic prostatitis, may avoid misinterpretation of intense FDG activity in the prostate, especially in the absence of administration of CT contrast to delineate the prostatic ducts.

## REFERENCES

1. Kumar R, Zhuang H, Alavi A. PET in the management of urologic malignancies. *Radiol Clin North Am.* 2004;42:1141-53. ix. [cross ref](#)
2. Cho SK, Choi JY, Yoo J, Cheon M, Lee JY, Hyun SH, et al. Incidental Focal (18)F-FDG Uptake in the Prostate: Clinical Significance and Differential Diagnostic Criteria. *Nucl Med Mol Imaging.* 2011;45:192-6. [cross ref](#)
3. Bhosale P, Balachandran A, Vikram R, Viswanathan C, Macapinlac H, Rohren E, et al. What Is the Clinical Significance of FDG Unexpected Uptake in the Prostate in Patients Undergoing PET/CT for Other Malignancies? *Int J Mol Imaging.* 2013;2013:476786.
4. Mitty HA. Roentgen features of reflux into the prostate, seminal vesicles and vasa deferentia. *Am J Roentgenol Radium Ther Nucl Med.* 1971;112:603-6. [cross ref](#)
5. Goluboff ET, Kaplan SA, Fisch H. Seminal vesicle urinary reflux as a complication of transurethral resection of ejaculatory ducts. *J Urol.* 1995;153:1234-5. [cross ref](#)
6. Fisch H, Kang YM, Johnson CW, Goluboff ET. Ejaculatory duct obstruction. *Curr Opin Urol.* 2002;12:509-15. [cross ref](#)