

# A seldom case of primary urethral malignant melanoma and breast cancer detected by $^{18}\text{F}$ -FDG PET/CT

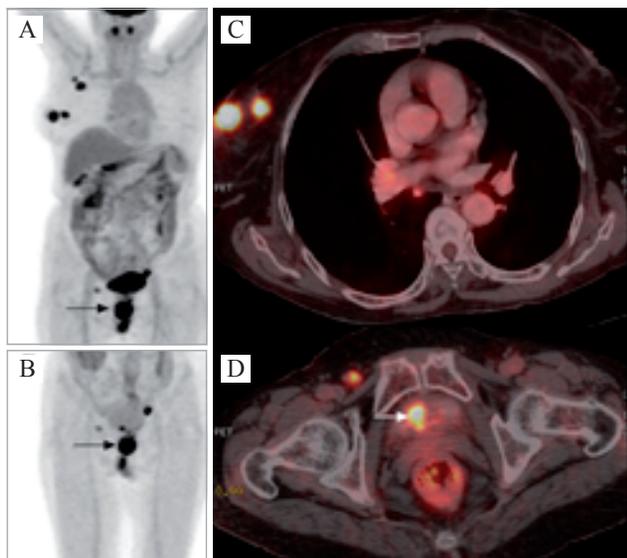
**To the Editor:** In the 1<sup>st</sup> issue of HJNM for 2012 we read with interest a case where 3 different cancers were detected [1]. Synchronous second malignancy can be incidentally detected in routine fluorine-18-fluoro-deoxy-glucose positron emission tomography/computed tomography ( $^{18}\text{F}$ -FDG PET/CT) imaging in approximately 1% of cancer patients with lungs being the most frequent site [2]. We report the  $^{18}\text{F}$ -FDG PET/CT scan for staging of the primary malignant melanoma of the urethra and for the detection of another malignancy in the breast in the same patient, since primary malignant melanoma of urethra is very seldom [3].

A 65 years old post-menopausal woman presented with increased frequency of micturition, dysuria and a gradually enlarging mass protruding from the external urethral meatus. Fine needle aspiration cytology (FNAC) performed from the mass revealed malignant melanoma. On cystourethroscopy examination, a 4x4cm blackish mass was noted at the external urethral meatus with a satellite nodule in the bladder trigone. Contrast enhanced CT (CeCT) of the pelvis showed soft tissue thickening along the urethra infiltrating urinary bladder neck and vagina. Analysis of  $^{18}\text{F}$ -FDG-PET/CeCT was performed to assess the extent of the disease. Intensely  $^{18}\text{F}$ -FDG avid soft tissue mass (SUVmax: 20.1) was noticed along the entire length of the urethra with

hypermetabolic right inguinal and left external iliac lymph nodes (Fig. 1). In addition to  $^{18}\text{F}$ -FDG uptake in the bladder wall and the vaginal wall, intense  $^{18}\text{F}$ -FDG uptake was also seen in two soft tissue nodules in the right breast and in the axillary lymph nodes suggestive of a second primary in the breast. Cytological diagnosis of intraductal breast carcinoma was made after FNAC from the breast nodule. Urethral melanoma was treated with anterior exenteration and ileal conduit. Histopathology confirmed the diagnosis of primary malignant melanoma of urethra infiltrating the urinary bladder and anterior vaginal wall. Postoperative histopathology from the right inguinal and left external iliac lymph nodes revealed metastatic disease. The diagnostic contribution of PET/CT was crucial. Melanotic melanoma cells have a distinctive MRI signal, which may be helpful in diagnosis. In this case whole body MRI could have been of equal value for accurate staging of urethral melanoma, but whole body MRI is a cumbersome procedure and often is not practical.

Primary urethral carcinoma is very rare and an annual age-adjusted incidence rate of 4.3 per 10<sup>6</sup> in males and 1.5 per 10<sup>6</sup> in females has been reported in USA [4]. Primary malignant melanoma of the urethra is rare, representing less than 1% of all melanomas and 4% of urethral cancers [3]. Furthermore, the incidence of two primary cancers is rare and is reported to be between 0.3% and 4.3%. Primary malignant melanoma of the urethra has a worse prognosis than its cutaneous counterpart, partly due to delayed diagnosis [5]. At the time of diagnosis, urethral melanoma is usually deeply invasive and locally extended to the vagina or vulva or the corpora cavernosa [6]. Inguinal lymph node metastases are present at diagnosis in half of the cases and distant metastases in one third of them. Positron emission tomography demonstrates specificity and accuracy of 94.7% and 73% respectively in detecting lymph nodal metastases [7]. Sensitivity, specificity and accuracy of  $^{18}\text{F}$ -FDG PET-CT in detecting metastases in high risk patients were 85%, 96%, 91% while for  $^{18}\text{F}$ -FDG PET-CT with dedicated CT interpretation were 98%, 94% and 96%, respectively [8]. Recently, the role of  $^{18}\text{F}$ -FDG PET/CT in treatment response evaluation of melanoma patients has also been demonstrated [9]. Incidental  $^{18}\text{F}$ -FDG uptake in the breasts is rare, and the lesion may be malignant in up to 57% of the cases [10].

To our knowledge no published literature is available on synchronous breast carcinoma and urethral melanoma. The reason why some patients are more prone to develop multiple cancers remains obscure. One possibility may be of a genetic predisposition linking the two cancers. Research suggests that mutations in CDKN2A, a gene that indicates high risk of developing melanoma, also puts carriers at an up to 3.8 times greater risk of breast cancer. Similarly, mutations in the gene of breast cancer susceptibility, BRCA2, increase carriers' risk of melanoma by as much as 2.58 times [11].



**Figure 1.** Maximum intensity projection  $^{18}\text{F}$ -FDG-PET image (A) showing intense  $^{18}\text{F}$ -FDG uptake along the entire length of the urethra (arrow), right inguinal and left external iliac lymph nodes, right breast and right axillary lymph nodes. Delayed PET image (B) after intravenous frusemide injection shows intense  $^{18}\text{F}$ -FDG uptake in the urethral mass (arrow) and focal  $^{18}\text{F}$ -FDG uptake in the bladder wall. Axial fused  $^{18}\text{F}$ -FDG PET/CT image at the level of breast (C) shows intense  $^{18}\text{F}$ -FDG uptake in two soft tissue lesions in the right breast. Axial fused  $^{18}\text{F}$ -FDG PET/CT image at the level of urinary bladder (D) showing  $^{18}\text{F}$ -FDG avid nodule in the wall of the urinary bladder (arrow) and right inguinal lymph node.

*In conclusion*, we describe a case of two primary carcinomas: a unique urethral malignant melanoma and a breast carcinoma, detected and staged by  $^{18}\text{F}$ -FDG-PET/CT.

The authors declare that they have no conflicts of interest.

### Bibliography

- Eren MS, Ozdogan O, Koyuncuoglu M, Degirmenci B. Three synchronous primary tumors with different histology detected by  $^{18}\text{F}$ -FDG-PET/CT. *Hell J Nucl Med* 2012; 15(1): 56-8.
- Ishimori T, Patel PV, Wahl RL. Detection of unexpected additional primary malignancies with PET/CT. *J Nucl Med* 2005; 46: 752-7.
- Robutti F, Betta PG, Bellingeri M et al. Primary malignant melanoma of the female urethral meatus. *Eur Urol* 1986; 12: 62-3.
- Swartz MA, Porter MP, Lin DW, Weiss NS. Incidence of primary urethral carcinoma in the United States. *Urology* 2006; 68: 1164-8.
- Weiss J, Elder D, Hamilton R. Melanoma of the male urethra: surgical approach and pathological analysis. *J Urol* 1982; 128: 382-5.
- Novak P, Strmiska M. Melanoblastoma of the female urethra. *Int Urol Nephrol* 1980; 12: 43-5.
- Singh B, Ezziddin S, Palmedo H et al. Preoperative  $^{18}\text{F}$ -FDG-PET/CT imaging and sentinel node biopsy in the detection of regional lymph node metastases in malignant melanoma. *Melanoma Res* 2008; 18: 346-52.
- Strobel K, Dummer R, Husarik DB et al. High-risk melanoma: accuracy of FDG PET/CT with added CT morphologic information for detection of metastases. *Radiology* 2007; 244: 566-74.
- Strobel K, Skalsky J, Steinert HC et al. S-100B and FDG-PET/CT in therapy response assessment of melanoma patients. *Dermatology* 2007; 215: 192-201.
- Litmanovich D, Gourevich K, Israel O et al. Unexpected foci of  $^{18}\text{F}$ -FDG uptake in the breast detected by PET/CT: incidence and clinical significance. *Eur J Nucl Med Mol Imaging* 2009; 36: 1558-64.
- Ho WL, Comber H, Hill AD, Murphy GM. Malignant melanoma and breast carcinoma: a bidirectional correlation. *Ir J Med Sci* 2011; 180: 901-3.

Kanhaiya Lal Agrawal<sup>1</sup> MBBS, Bhagwant Rai Mittal<sup>1</sup> MD, DNB, Kuruva Manohar<sup>1</sup> MD, Anish Bhattacharya<sup>1</sup> DNB, Santosh Kumar<sup>2</sup> MS, MCh, Shrawan Kumar Singh<sup>2</sup> MS, MCh

1. Department of Nuclear Medicine and PET and 2. Department of Urology, Postgraduate Institute of Medical Education and Research, Chandigarh – 160 012 (India)

#### Dr. B.R.Mittal, Prof. & Head

Department of Nuclear Medicine & PET, PGIMER, Chandigarh – 160 012, India  
Tel: +91 172 2756722, Fax: +91 172 2742858, E-mail: brmittal@yahoo.com

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