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**CASE REPORT**

# A rare primary malignant vaginal melanoma detected by 18 [F]-FDG PET/CT imaging

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**ABSTRACT**

A malignant melanoma in the vagina is a rare entity, for which there is little evidence-based literature for guiding clinicians to understand the importance of disease staging via noninvasive imaging strategy. Conventional imaging techniques i.e. computed tomography (CT) may be suboptimal in evaluating a small volume tumour, which may lead to inaccurate staging of a loco-regional tumour. A multimodality imaging exploiting a glucose biomarker, i.e. 18 [F]FDG PET/CT, is being increasingly used for tumour staging, particularly when the other imaging modalities have failed, although its precise role in the T- staging remains to be defined. This paper reports a 51-year-old lady who presented with pervaginal bleeding for 3 months. She has no constitutional symptoms or history of bleeding tendency. Examination of the vagina revealed blood clots without discernible mucosal abnormalities. CT abdomen revealed no perceptible abnormalities aside for an asymmetry of the anterior vaginal fornices. A 18[F]-FDG PET/CT showed a focus of an FDG-avid lesion embedded in the right anterior vaginal fornix without lymphatic or distant metastasis. Histological sections of the tumour lesion confirmed the diagnosis of a primary malignant vaginal melanoma. This report documents the importance of FDG-PET/CT in delineating a small volume tumour which is imperceptible on CT imaging. 

Keywords: vaginal melanoma, 18 [F]-FDG PET/CT, tumour staging, vaginal bleeding

## INTRODUCTION

Malignant melanoma is an aggressive disease which affects both skin and mucosal surfaces. Melanoma of the vagina and urethra is an extraordinarily rare condition accounting for less than 10% of all female genital tract melanomas, and 2.4–2.8% of all vaginal cancers [1]. Malignant melanoma of the vagina is a disease of postmenopausal women, with 75% of women being over 50 years of age [2]. It may arise anywhere in the vagina with a predilection for the lower third [1]. Due to the scarcity of malignant melanoma in the vagina, there is little evidence-based literature for guiding clinicians to understand the importance of disease staging via noninvasive imaging strategy. This is a contentious issue which affects the way this tumour is managed appropriately, whereby tumour size, regional infiltration and groin lymphatic involvement are the cornerstone for disease prognostications [3,4].

Patients with a locoregional tumour may benefit from a major exenterative surgery, should the morphology of the tumour be well delineated on

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conventional imaging techniques i.e. computed tomography (CT) or magnetic resonance imaging (MRI). Nevertheless, the small volume tumour may not be easily discerned on conventional imaging, following which failure to stage a loco-regional tumour accurately may lead to high risk of local recurrence [5]. To avert problems with inconspicuous small volume lesions, functional imaging method has a potential role in localising an equivocal lesion on CT. With the use of fluorodeoxyglucose (FDG) as a glycolytic indicator tumour-altered metabolism in PET/CT study, a discrete metabolic area representing a small unenhanced lesion on CT can be easily localised. In this regard, FDG-PET/CT plays a role as an important marker for the staging of primary malignant vaginal melanoma. This case report highlights the importance of FDG-PET/CT as a decisive tool in the staging of an inconspicuous CT lesion of a primary malignant vaginal melanoma.

**CASE REPORT**

A 51-year-old lady presented with pervaginal bleeding for 3 months. She has no constitutional symptoms or history of bleeding tendency. Examination of the vagina revealed blood clots without discernible mucosal abnormalities. CT abdomen revealed no perceptible abnormalities aside from an asymmetry of the anterior vaginal fornices (Figure 1). A 18[F]-FDG PET/CT showed a stage IIA focus of an FDG-avid lesion ($SUV_{max}$: 38.44) embedded in the right anterior vaginal fornix without perceptible regional infiltration, lymphatic or distant metastasis (Figures 2, 3 and 4). She underwent a radical vaginectomy followed by local radiotherapy. She was discharged well without signs of disease recurrence. Histological sections of the tumour lesion confirmed the diagnosis of a primary malignant vaginal melanoma (Figure 5).

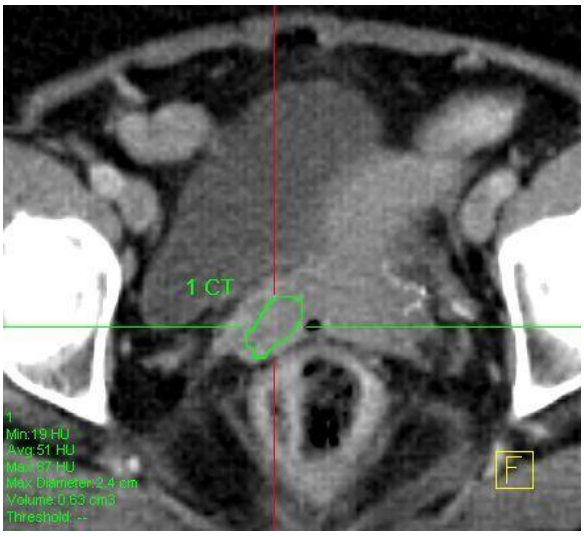



**Figure 1** Axial CT image shows fairly normal vaginal soft tissue without discernible enhancing lesion. The 'hairline' marker indicates the site of the corroborated FDG-avid abnormality representing a tumour focus on PET/CT.

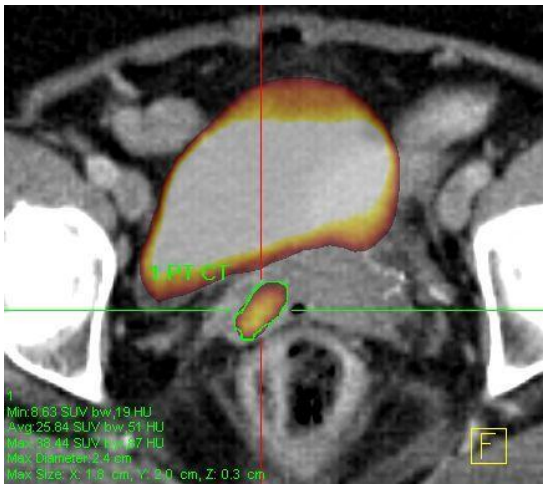



**Figure 2** Axial fused PET/CT image shows an avid FDG-avid lesion (SUVmax: 38.44) in the right anterior vaginal fornix (hairline).

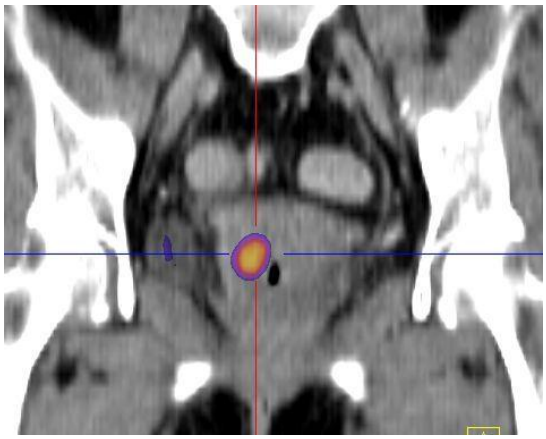


**Figure 3** Coronal fused PET/CT image shows the location of the FDG-avid melanoma in the upper 1/3 of the right vaginal fornix.

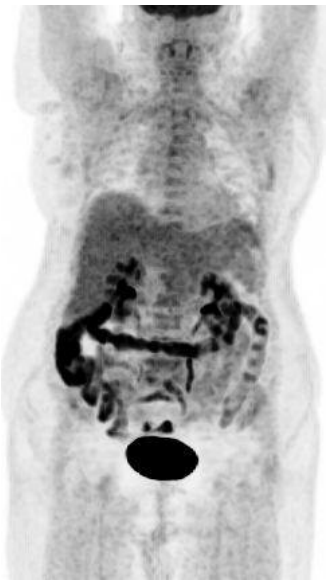
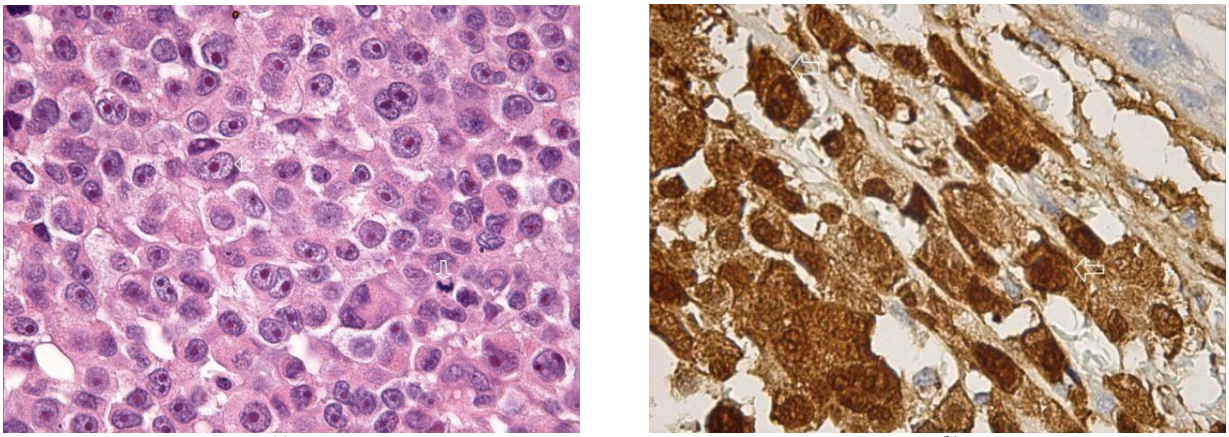


**Figure 4** MIP PET image exhibits physiological FDG appearance in the bladder and the bowel without evidence of groin lymphatic involvements or distant metastasis



(a) (b)

**Figure 5** a) (H&E staining, original magnification X 400). Photomicrograph showing sheets of malignant melanoma cells with prominent nucleoli (arrow head). A mitosis is also seen (block arrow); b) (S100 immunostaining, original magnification X 400). Photomicrograph showing infiltrating malignant melanoma cells (arrows).

## DISCUSSION

It is worth noting that the prevalence of primary malignant melanoma in the upper third of the vagina is exceedingly rare. By virtue of its location, the tumour can non-specifically elude the behaviour of squamous cell carcinoma, metastasis or a benign lesion i.e. leimyoma of the vagina, which may require a different treatment strategy. As the vagina has a diffuse lymphatic plexus and the tumour can spread hematogenously, most patients with a locoregional tumour invariably present with advanced disease [2, 6, 7]. This constellation of implications poses a challenge and a clinical need for effective diagnostic paradigms. This case documents a potentially infiltrative malignant melanoma in a premenauposal lady who presented with per-vaginal bleeding for which CT failed to localise the tumour site. The use of FDG PET/CT as a staging tool in this particular case has successfully distinguished an abnormally metabolic vaginal tumour from normal tissue for which the lesion was staged as a IIA disease based on the imaging findings [8]. Furthermore, absence of metachronous hypermetabolic lesion confirmed no further spread of the disease elsewhere. It is known that FDG-PET as a combined PET/CT study is a useful tool in the early detection of altered cellular metabolism before morphological deformity takes precedence [9]. This is crucial as the determination of a conservative approach in a low disease stage is deemed to be beneficial to those who are averse to the potential morbidity of toxic chemotherapy. The value of FDG is well known in the M staging of the tumour [10]. This report emphasises the role of the FDG-PET/CT in the T staging of an imperceptible small volume tumour on CT for which the detection of the tumour site has facilitated surgical planning. A combination of radical vaginectomy and local radiotherapy were instituted to balance the potential risk of microscopic regional tumour infiltration. In other words, FDG PET/CT provides ancillary benefits for the treating surgeon as information on the tumour extent is always available for accurate pre-surgical mapping. Early diagnosis of a locoregional malignant vaginal melanoma may give patients the best chance for prolonged survival.

## CONCLUSION

This report documents the importance of FDG-PET/CT in delineating a small volume tumour which is imperceptible on CT imaging. The 18 [F] - FDG PET/CT may potentially be an important tool in the early staging of a primary malignant vaginal melanoma which essentially helps to improve the disease prognosis.

## REFERENCES

1. Moros ML, Ferrer FP, Mitchell MJ, Romeo JA and Lacruz RL. Primary malignant melanoma of the vagina: poor response to radical surgery and adjuvant therapy. Eur J Obstet Gynecol Reprod Biol 2004; 113(2):248–250.
2. Parikh JH, Barton DP, Ind TE and Sohaib SA. MR imaging features of vaginal malignancies. Radiographics 2008; 28(1):49–63.
3. Tjalma WA, Monaghan JM, de Barros Lopes A, Naik R and Nordin A. Primary vaginal melanoma and long-term survivors. Eur J Gynaecol Oncol 2001; 22(1):20–22.
4. Stehman FB and Look KY. Carcinoma of the vulva. Obstet Gynecol. 2006; 107(3):719–733.
5. Oudoux A, Rousseau T, Bridji B, Resche I and Rousseau C. Interest of F-18 fluorodeoxyglucose positron emission tomography in the evaluation of vaginal malignant melanoma. Gynecol Oncol 2004; 95(3):765–768.
6. Meier F, Will S, Ellwanger U, Schlagenhauff B, Schittek B, Rassner G and Garbe C. Metastatic pathways and time courses in the orderly progression of cutaneous melanoma. Br J Dermatol 2002; 147(1):62–70.
7. Gungor T, Altinkaya SO, Ozat M, Bayramoglu H and Mollamahmutoglu L. Primary Malignant Melanoma of the Female Genital Tract. Taiwan J Obstet Gynecol 2009; 48(1):169–175.
8. American Joint Committee on Cancer. Melanoma of the skin. In: Greene FL, Page DL, Fleming ID, Fritz AG, Balch CM, Haller DG, and Morrow M (eds.) AJCC Cancer Staging Manual, 6th ed. New York, NY: Springer, 2002.
9. Fathinul Fikri AS and Lau WFE. Significance of subcentimetre 18F-FDG PET/CT pulmonary abnormality in patients with known extrapulmonary malignancy. Biomed Imaging Interv J 2010; 6(4):e34
10. Grenader T, Isacson R, Reinus C, Rosengarten O, Barenholz O, Hyman J, Gabizon A and Beller U. Primary amelanotic melanoma of the vagina. Onkologie 2008; 31(8-9):474–476.