

## Incidental Detection of Endometriosis with <sup>18</sup>F-Fluorodeoxyglucose Positron Emission Tomography-Computed Tomography in a Patient with Cervical Intraepithelial Neoplasia and Adenomyosis

### Abstract

Endometriosis is commonly associated with chronic pelvic pain and its presentation varies between individuals. The only way to confirm the presence of endometriosis is via keyhole or open surgery. In the presence of hematuria, deep endometriotic infiltration needs to be considered. We share an interesting case highlighting the role of <sup>18</sup>F-fluorodeoxyglucose positron emission tomography-computed tomography in evaluating a posterior urinary bladder wall lesion and hypodense liver lesions in a middle-aged woman with presenting with frank hematuria in the background of treated cervical intraepithelial neoplasia and adenomyosis.

**Keywords:** <sup>18</sup>F-Fluorodeoxyglucose, adenomyosis, cervical intraepithelial neoplasia, endometriosis, positron emission tomography-computed tomography, urinary bladder

A 49-year-old Chinese female with a history of treatment for cervical intraepithelial neoplasia (CIN) III underwent hysterectomy for dysfunctional uterine bleeding and hematuria in a private medical center in December 2017 which was later histopathologically confirmed to be adenomyosis with no residual CIN on the specimen. She remained well until September 2018 when she presented to our hospital with abdominal discomfort and frank hematuria. Cystoscopy showed a cystic lesion invading to the urinary bladder mucosa which of which histopathological examination reported mullerianosis, but malignancy could not be excluded. The CA-125 was elevated at 102 ng/mL. The magnetic resonance imaging performed to delineate the lesion showed irregular enhancing mass which could represent endometrial cyst [Figure 1a]. In view of history of CIN III and the possibility of Mullerian carcinoma, contrast-enhanced computed tomography (CT) of the abdomen and pelvis performed in October 2018 showed an irregular lobulated soft tissue mass measuring 2.6 cm × 3.6 cm at the right posterolateral aspect of the urinary bladder wall and hypodense liver

lesions in segment VII (0.9 cm × 1.0 cm) and VIII (1.1 cm × 0.8 cm).

<sup>18</sup>F-Fluorodeoxyglucose (FDG) positron emission tomography (PET)/CT was performed to assess the significance of the lesions and to detect other possible metastases. The liver lesions were not metabolically active whereas the lesion at the right posterolateral wall of the urinary bladder was metabolically active [Figure 1b and c]. With the differential diagnosis of either endometriosis or worse-vaginal carcinoma, she underwent an *en bloc* upper vaginectomy with posterior bladder wall, bilateral salpingo-oophorectomy, omentectomy, and bilateral pelvic lymph node dissection. The histopathological examination of the surgical specimens reported multiple endometriotic foci at the ovaries and around the vaginal and bladder walls causing distortion.

The actual prevalence of endometriosis worldwide is unknown as either key-hole or open surgery is required for definitive diagnosis. No noninvasive imaging modality is able to confirm endometriosis with enough accuracy to replace surgery.<sup>[1]</sup> A study by Eisenberg *et al.* reported that the point prevalence of endometriosis was 10.8 per 1000 and an average annual incidence rate of 7.2 per 10,000 women in child-bearing

**Alex Cheen  
Hoe Khoo,  
Ghee Kheng Chew<sup>1</sup>**

*Departments of Nuclear  
Medicine and 'Obstetrics and  
Gynaecology, Penang Adventist  
Hospital, Penang, Malaysia*

### Address for correspondence:

*Dr. Alex Cheen Hoe Khoo,  
Department of Nuclear  
Medicine, Penang Adventist  
Hospital, 456, Jalan Burma  
10350 Georgetown, Penang,  
Malaysia.  
E-mail: dr.alexkhoo@gmail.com*

### Access this article online

**Website:** www.ijnm.in

**DOI:** 10.4103/ijnm.IJNM\_27\_19

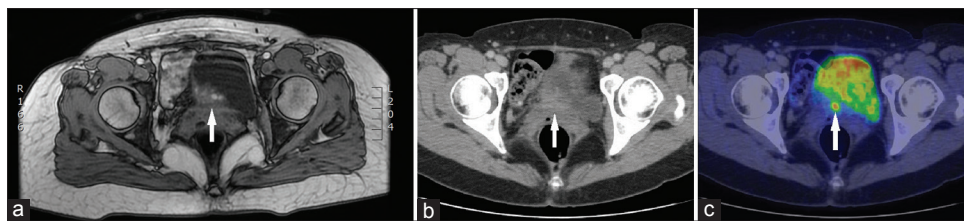
### Quick Response Code:



**How to cite this article:** Hoe Khoo AC, Chew GK. Incidental detection of endometriosis with <sup>18</sup>F-fluorodeoxyglucose positron emission tomography-computed tomography in a patient with cervical intraepithelial neoplasia and adenomyosis. Indian J Nucl Med 2019;34:162-3.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**For reprints contact:** reprints@medknow.com



**Figure 1:** (a) The axial dual echo fast spoiled gradient echo (FSPGR) protocol image of the lesion indicated by the white arrow. (b and c) The computed tomography and fused positron emission tomography-computed tomography axial images of the metabolically active lesion at the posterolateral wall of the urinary bladder – indicated by the white arrow

age.<sup>[2]</sup> Endometriosis is a condition where the endometrial tissue is present outside the uterine cavity and causes pelvic inflammation. Although 18F-FDG is sensitive in detecting inflammatory changes, Fastrez *et al.* did not observe any hypermetabolic activity in relation to endometriosis using 18F-FDG PET/CT in their study of 10 patients.<sup>[3]</sup> On the contrary, Jeffry *et al.* reported their case where endometriosis was detected by 18F-FDG PET/CT.<sup>[4]</sup> In the study by Setubal *et al.* on nine patients, PET scans were reported to have no value as a major tool to evaluate deep endometriosis or other forms of endometriotic disease.<sup>[5]</sup> However, it is important to note that endometriosis is affected by the cyclical hormones and 18F-FDG PET/CT studies were performed at variable periods of the affected women's menstrual cycles. The common sites of endometriosis include ovaries, fallopian tubes, pelvic peritoneum, and pelvic ligaments, whereas atypical sites include the gastrointestinal tract, urinary bladder, ureter, abdominal wall, and pleura.<sup>[6]</sup> Patients with endometriosis at the urinary bladder frequently present with urinary frequency and if longstanding may present with hematuria due to the deep endometriotic infiltration.<sup>[7,8]</sup> This is in keeping with our patient whose initial hematuria was overlooked. This case highlights the benefits of 18F-FDG PET/CT in our management planning, by excluding distant metastasis to the liver and identifying the nature of the soft tissue mass at the right posterolateral wall of the urinary bladder.

#### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal.

The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

#### Financial support and sponsorship

Nil.

#### Conflicts of interest

There are no conflicts of interest.

#### References

1. Nisenblat V, Bossuyt PM, Farquhar C, Johnson N, Hull ML. Imaging modalities for the non-invasive diagnosis of endometriosis. *Cochrane Database Syst Rev* 2016;2:CD009591.
2. Eisenberg VH, Weil C, Chodick G, Shalev V. Epidemiology of endometriosis: A large population-based database study from a healthcare provider with 2 million members. *BJOG* 2018;125:55-62.
3. Fastrez M, Nogarède C, Tondeur M, Sirtaine N, Rozenberg S. Evaluation of 18FDG PET-CT in the diagnosis of endometriosis: A prospective study. *Reprod Sci* 2011;18:540-4.
4. Jeffry L, Kerrou K, Camatte S, Metzger U, Lelièvre L, Talbot JN, *et al.* Endometriosis with FDG uptake on PET. *Eur J Obstet Gynecol Reprod Biol* 2004;117:236-9.
5. Setubal A, Maia S, Lowenthal C, Sidiropoulou Z. FDG-PET value in deep endometriosis. *Gynecol Surg* 2011;8:305-9.
6. Sonavane SK, Kantawala KP, Menias CO. Beyond the boundaries-endometriosis: Typical and atypical locations. *Curr Probl Diagn Radiol* 2011;40:219-32.
7. Lee HJ, Park YM, Jee BC, Kim YB, Suh CS. Various anatomic locations of surgically proven endometriosis: A single-center experience. *Obstet Gynecol Sci* 2015;58:53-8.
8. Tarumi Y, Mori T, Kusuki I, Ito F, Kitawaki J. Endometrioid adenocarcinoma arising from deep infiltrating endometriosis involving the bladder: A case report and review of the literature. *Gynecol Oncol Rep* 2015;13:68-70.