

# FDG-PET/CT Finding of an Unusual Primary Diffuse Large B Cell Lymphoma of the Cervix: A Case Report

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## Abstract

We present a case of a 46-year-old female who was hospitalized with a 20-day history of irregular vaginal bleeding after menopause. Laboratory tests of tumor markers revealed negativity for carcinoma embryonic antigen (CEA) and carbohydrate antigen 125(CA125). Transvaginal ultrasound showed a hypoechoic mass in the cervix uterus. Fluorine-18-Cuorodeoxyglucose positron emission tomography/computed tomography (<sup>18</sup>F-FDG PET/CT) revealed a significantly enlarged cervix with an intense metabolic signal due to uptake of <sup>18</sup>F-FDG. The patient was negative for systemic FDG metabolism in the lymph nodes and bone marrow. The subsequent histopathologic examination confirmed the diagnosis of primary diffuse large B-Cell lymphoma non-germinal center B-cell-like (DLBCL-NGCB) of the cervix.

**Keywords:** FDG-PET/CT • Diffuse large B cell lymphoma • Cervix • Case report

## Introduction

Primary Lymphoma of the Female Genital Tract (PLFGT) is relatively rare and its etiology remains unclear. The most common site of PLFGT is the ovary (37%), followed by the cervix (21.4%), uterus (16.5%), vagina (11.8%) and vulva (8.8%) [1]. Primary Cervical Lymphoma (PCL) is unusual. The patient presented with an atypical or asymptomatic clinical presentation. Patients who have an incidental pelvic mass often present with nonspecific symptoms, such as abdominal discomfort, stomachache, abdominal distension, vaginal bleeding or drainage [2]. PCL can be suggested based on imaging results, but the diagnosis depends on pathological examination as the gold standard. Non-Hodgkin's Lymphoma (NHL) is the most common pathological type. In terms of imaging, it is difficult to distinguish between primary cervical lymphoma and a secondary malignant tumor, so imaging often needs to be combined with a pathology report.

## Case Presentation

A 46-year-old female was hospitalized with a 20-day history of vaginal irregular bleeding after menopause. Her physical examination showed that in general, she was in good condition and she had no abdominal pain or abdominal distension and no remarkable medical history. Laboratory tests of tumor markers revealed negativity for CEA and CA125. Transvaginal ultrasonography indicated that there was a hypoechoic mass in the cervix (upper vagina), with a clear boundary and roughly complete shape and the posterior lip of the cervix was not clear. The sonographer thought it was a vaginal tumor or cervical cancer. To further clarify the benign and malignant cervical lesions and systemic conditions, the patient was referred to whole-body <sup>18</sup>F-FDG PET/CT imaging (GE Discovery 710). <sup>18</sup>F-FDG PET/CT revealed a significantly enlarged area in the cervix consisting of a soft tissue

mass of approximately 59 mm × 79 mm × 72 mm with a clear boundary with surrounding tissues and organs. This lesion was metabolically active, having intense uptake of <sup>18</sup>F-FDG with a maximum standardized uptake value (SUV<sub>max</sub>) of 18.3 (Figure 1).

The patient was negative for systemic FDG metabolism in the lymph nodes and bone marrow. The PET/CT diagnostic comments were as follows:

Lymphoma is a high possibility in the cervical lesions, because cervical cancer cannot be ruled out, puncture biopsy is recommended. The patient then underwent a cervical puncture biopsy. The results indicated small round cell malignancy with an immunohistochemical tendency toward lymphoma. The immunohistochemical results were as follows: cell proliferation nuclear antigen Ki67 (80-90%+), Chromogranin A (CgA,-), Synaptophysin (Syn,-), CD56 (-), Melan-A (-), Leukocyte Common Antigen (LCA,+), CKpan(-), Vimentin(Vim,-), Cytokeratin 5/6(CK5/6,-), protein16(P16,-), Thyroid transcription factor-1 (TTF-1,-), CD20(++), B cell specific activator protein-5(PAX-5,+), MUN1(+), Recombinant human B-cell lymphoma protein-6(Bcl-6,-), consistent with diffuse large B-cell lymphoma non-germinal center type. Hence, combined with the patient's pathological and immunohistochemical results, cervical lesions were diagnosed as primary DLBCL-NGCB and the patient received treatment with R-CHOP(Rituximab, cyclophosphamide, Adriamycin, vincristine, prednisone) chemotherapy regimens (Figure 2).

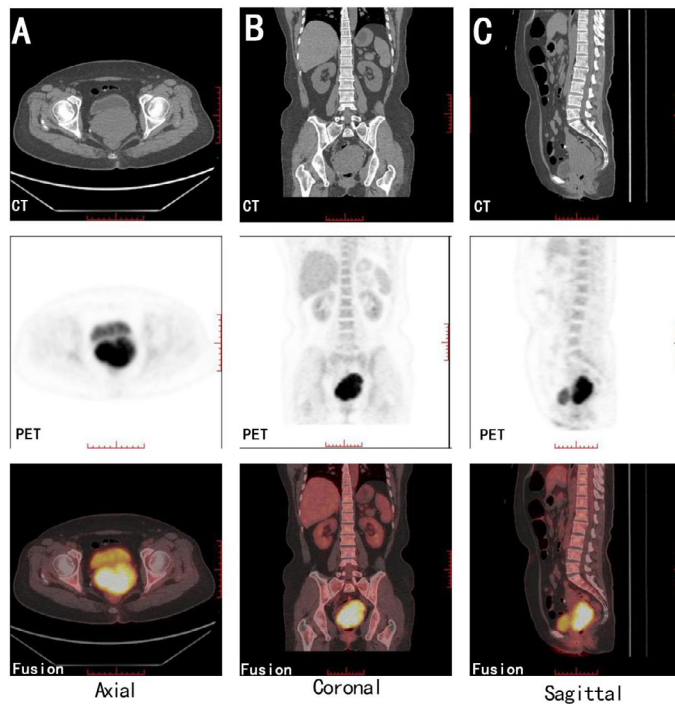
## Results and Discussion

Primary extranodal NHL accounts for 25% to 35% of all NHLs [2]. Primary lymphomas of the female reproductive system are rare, accounting for 0.2% to 1.1% of all lymphoma cases [1]. According to some studies, 21.4% of lymphomas occur in the cervix, a location that is second only to the ovaries (37%) and multiple organ disease involving the cervix is more common than primary lymphoma [1]. Most of the pathological types of primary cervical lymphoma are NHL, especially diffuse large B cell lymphoma [1]. The age of onset ranges from 20 to 80 years, with a median onset age of 40 years [1]. To date, the etiology of cervical DLBCL remains unclear. Studies have suggested that cervical DLBCL is associated with chronic inflammatory stimulation of the cervix [3]. Other studies have reported that extranodal NK/T cell lymphoma of the cervical, vaginal and nasal types is associated with Epstein Barr(EB) virus infection [4]. Clinical symptoms and signs of cervical DLBCL are similar to those of other malignant tumors of the cervix, often manifesting as irregular vaginal bleeding, increased vaginal secretions and vaginal drainage. Sometimes, the amount of blood loss is not positively correlated with the severity of the disease, so it is easy to ignore [3].

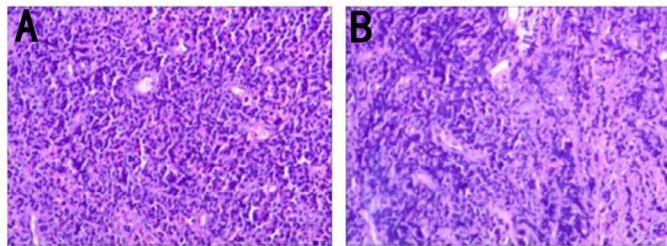
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**Figure 1.** F-FDG PET/CT revealed a significantly enlarged area in the cervix consisting of a soft tissue mass (59 mm × 79 mm × 72 mm) with a clear boundary with surrounding tissues and organs,  $SUV_{max}$  18.3. **A)** Axial, **B)** Coronal and **C)** Sagittal.



**Figure 2.** A biopsy of the tumor was performed. Hematoxylin and eosin staining of these sections of the tumors consisted of small round cells diffuse hyperplasia and distributed in nests. The immunohistochemical results revealed primary diffuse large B-Cell lymphoma non-germinal center B-cell-like (A,B × 20).

In terms of imaging, cervical DLBCL on CT showed diffuse enlargement and mild enhancement of the cervix, with clear boundaries. On MRI, it showed a T1 equisignal or low signal and a T2 high signal. Despite the tumor size, the cervical mucosa was intact. This imaging feature is helpful for the identification of cervical cancer [5]. The PET/CT findings of our case showed cervical enlargement with clear boundaries and a regular shape. This lesion was metabolically active with intense uptake of  $^{18}F$ -FDG, with an  $SUV_{max}$  of 18.3. PET-CT examination has great advantages in the diagnosis, efficacy evaluation and follow-up of lymphoma. Compared with CT and MRI, PET-CT has higher sensitivity and specificity. It can accurately display the location of the lesion, the residual condition of the lesion postoperatively and the changes in the metabolic activity of the tumor before and after treatment. Primary diffuse large B cell lymphoma of the cervix has rarely been reported and even fewer cases have been diagnosed by  $^{18}F$ -PET/CT imaging. Zhou W, et al. reported PET/CT imaging of a 38-year-old female with diffuse large B-cell lymphoma of the cervix, whose CT findings were similar to those of this case with significantly increased FDG and an  $SUV_{max}$  of 8.1, which was lower than that in our case [6]. Gong J, et al. reported PET/CT and MRI imaging of a 27-year-old female with peripheral cervical T-cell lymphoma, showing an abnormal increase in DFG and a  $SUV_{max}$  of 26.9 [7].

FDG PET/CT provides limited information on cervical lymphoma. FDG PET/CT may be useful for the detection, staging and treatment evaluation of cervical lymphoma [8]. High-grade cervical lymphomas usually show intense FDG uptake, while low-grade lymphomas often show low FDG uptake [8].

FDG-PET/CT after initial diagnosis can identify systemic lymph node and bone marrow involvement. Therefore, FDG PET/CT may be helpful in the assessment of tumor grading [8]. Apart from cervical lymphoma, there are many reasons for increased uterine FDG uptake, mainly including physiological endometrial uptake, a postpartum uterus, uterine fibroids, uterine leiomyosarcoma, cervical squamous cell carcinoma and endometrial carcinoma, that need to be differentiated [9].

## Conclusion

In summary, primary cervical DLBCL is rare and its clinical features and imaging findings are not significantly specific. If the cervical lesion concentration of FDG shows hypermetabolism on PET-CT, the possibility of cervical DLBCL should be considered, but the final diagnosis is dependent on pathological and immunohistochemical results.

## Acknowledgement

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## Conflict of Interest

There is no conflict of interest by author.

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