

# Simultaneous breast cancer and DLBCL lymphoma — role of PET/CT examination with $^{18}\text{F}$ -FDG and $^{18}\text{F}$ -FES

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## Abstract

Breast cancer is the most common cancer in women in the western world.

The estrogen receptor (ER) is expressed in two thirds of newly diagnosed breast cancers, so hormonal treatment is performed only in the receptor positive patients. The most successful ER imaging radiopharmaceutical in PET techniques is  $^{16}\alpha$ -[ $^{18}\text{F}$ ]-flouro- $^{17}\beta$ -estradiol ( $^{18}\text{F}$ -FES).

The diffuse large B cell lymphoma (DLBCL) is one of the most common NHL, however, non-Hodgkin lymphoma constitutes only 4% of all primary cancers in women. The typical staging of disease is done using 18-fluorodeoksyglukose ( $^{18}\text{F}$ -FDG) PET/CT.

**KEY words:** PET/CT, FES, breast cancer

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## Case report

A 73-year-old female with no significant medical history, two months before PET/CT examination found a tumour in left axillary. At first, she underwent lymphatic node ultrasonography, which revealed large left axilla tumour and the next step tumour fine-needle aspiration (FNA) showed *carcinomatose neoplasmatica*.

She was referred to breast ultrasonography and mammography, which showed bilateral tumours (right breast  $13 \times 12$  mm, left breast  $18 \times 13$  mm) with BIRADS 5 so the patient underwent a core-needle biopsy. The results showed *carcinoma invasivum* NST G1 (Ki67 1%), ER (3+) 100% and HER-2 negative in both breasts. Repeated biopsy of the left axillary lymph node did not answer the question what the origin of this tumour was.

Due to inconclusive examination, the patient was referred to PET/CT with  $^{18}\text{F}$ -FES (30' after injection of 3.5 MBq/kg, Siemens Biograph 64 PET). The study showed pathological uptakes of the radiopharmaceutical in both breast tumours (left with SUVmax 5.3

Figure 1. A, B; right with SUVmax 1.9; Figure 1. C, D). There were no other pathological uptakes, especially in the left axilla tumour (Figure 1. B, C, D). The examination also showed enlarged cervical nodes without the radiotracer uptake.

To summarise, the examination revealed that lymph node package in left axilla and enlarged cervical nodes were not estrogen positive metastasis from breast cancer.

Therefore, a core-needle biopsy of the left axilla lymph node was done with result of DLBCL Ki67 90%.

For DLBCL staging PET/CT with  $^{18}\text{F}$ -FDG was performed (60' after injection of 3 MBq/kg). Due to the fast progress of the illness in the left axilla, the patient could not raise arms above the head so the examination was done with arms along the body.

The study showed very weak uptake of radiopharmaceuticals in both breast tumours with SUVmax 2.1 (Figure 2. E, F). The pathological uptakes were present in the left axilla tumour and enlarged cervical nodes, with SUVmax up to 23.4 (Figure 2. F, G, H). There were no other pathological uptakes.

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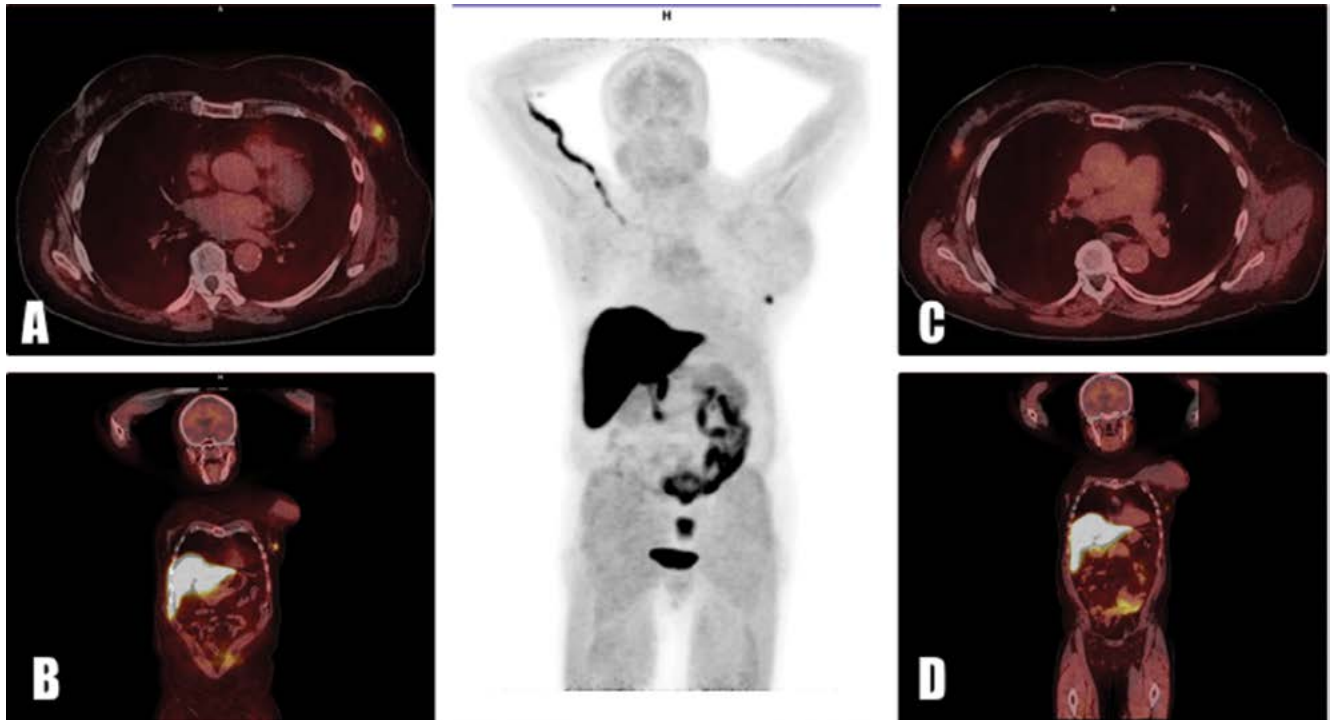


Figure 1.

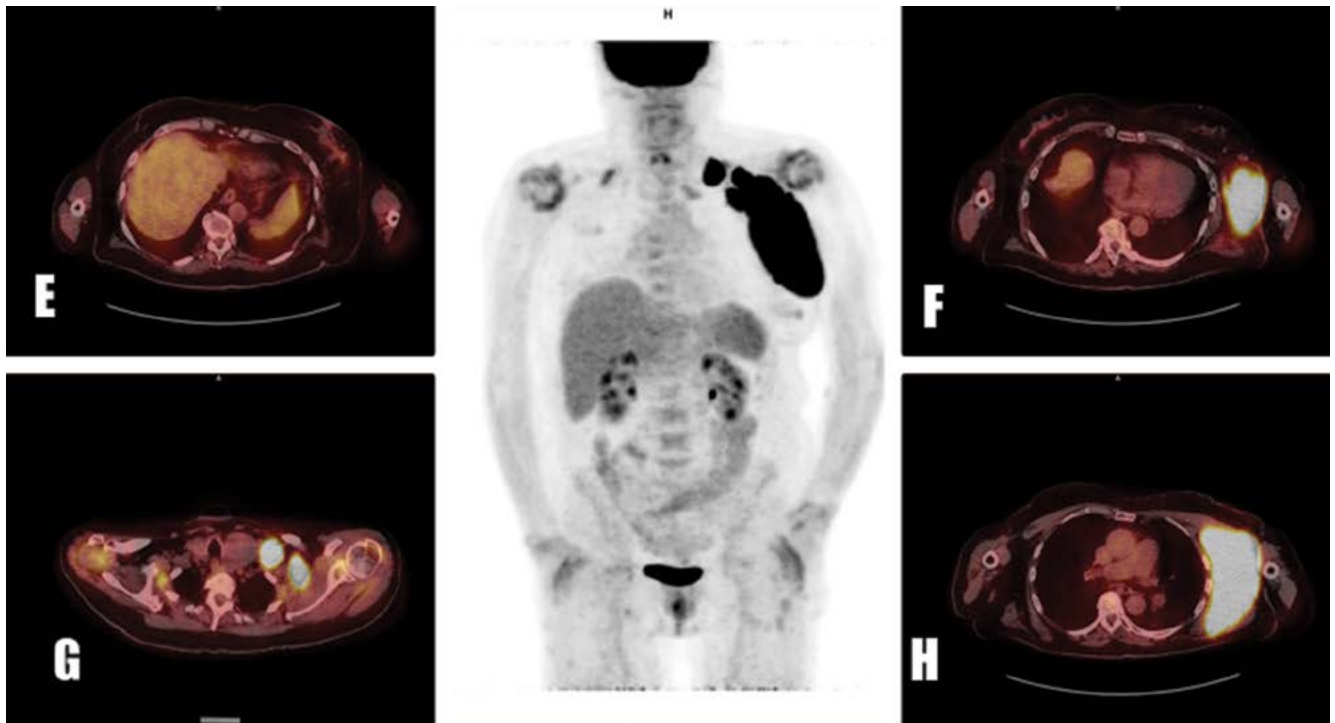


Figure 2.

## Discussion

Simultaneous breast cancer and DLBCL are an exceptional and rare situation. Literature describes only 2.9% of such cases. Therapy depends on the stage of advancement of concomitant diseases. In

our case and other ones described in literature there was a problem with non-conclusive FNA of lymph nodes. Lack of clear results can arise from the low sensitivity of this method. PET/CT with  $^{18}\text{F}$ -FDG and  $^{18}\text{F}$ -FES performed along with FNA or core-needle biopsy allows to establish the right diagnosis and the stage of both diseases.