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Detection of Dural Metastases Before the Onset of Clinical Symptoms by 16 alpha-[F-18]Fluoro-17 beta-Estradiol PET in a Patient With Estrogen Receptor-Positive Breast Cancer

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Published in:
Clinical Nuclear Medicine

DOI:
[10.1097/RLU.0000000000003382](https://doi.org/10.1097/RLU.0000000000003382)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2021

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Boers, J., Schröder, C. P., Hospers, G. A. P., de Vries, E. F. J., & Glaudemans, A. W. J. M. (2021). Detection of Dural Metastases Before the Onset of Clinical Symptoms by 16 alpha-[F-18]Fluoro-17 beta-Estradiol PET in a Patient With Estrogen Receptor-Positive Breast Cancer. *Clinical Nuclear Medicine*, 46(3), e165-e167. <https://doi.org/10.1097/RLU.0000000000003382>

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FIGURE 1. Here, we present images of a 76-year-old woman with estrogen receptor (ER)-positive metastatic breast cancer. A whole-body [^{18}F]-FDG PET/CT, performed for disease staging according to guidelines,¹ showed extensive metastatic disease in bone, bone marrow, mediastinal lymph nodes, and physiological [^{18}F]-FDG uptake in the brain (A: maximum intensity projection image). The patient showed disease progression after 2 lines of endocrine treatment. To assess ER status of metastases, PET imaging with 16 α -[^{18}F]fluoro-17 β -estradiol ([^{18}F]-FES) was performed as part of a clinical trial,² showing high ER expression in the known metastases, but also increased [^{18}F]-FES uptake in the dural region, interpreted as possible dural metastases (B: maximum intensity projection image). The SUVmax values of the dural lesions ranged between 3.6 and 4.4. In literature, an SUVmax cutoff value of ≥ 2.0 is considered as ER-positive.^{2,3} These lesions were not detected with [^{18}F]-FDG PET/CT imaging, and associated clinical symptoms were lacking at the moment the scans were performed. Tumor progression was confirmed on all imaging modalities, and a third-line endocrine treatment was started.

FIGURE 2. Three weeks later, the patient experienced an accidental fall and a CT scan of the brain revealed bilateral subdural lesions, interpreted as traumatic hematomas (A). However, further analysis with brain MRI did confirm dural metastases (B), as previously already detected on [^{18}F]-FES PET (C: fused PET/CT image). These lesions were not visible on the previous [^{18}F]-FDG PET because of physiological [^{18}F]-FDG uptake (D: fused PET/CT image). In literature, a high degree of agreement between [^{18}F]-FES PET findings and ER status by immunohistochemical assay is described.⁴ In our center, [^{18}F]-FES PET is used in breast cancer patients presenting with a clinical dilemma.⁵ By providing whole-body information on ER status of metastases, [^{18}F]-FES PET can improve treatment decision-making.^{6,7} In conclusion, [^{18}F]-FES PET can be used in difficult cases when it is important to collect all available information for therapy decision-making. If [^{18}F]-FES PET indicates possible dural/intracerebral lesions, further analysis is warranted, even in the absence of clinical symptoms. The clinical added value of [^{18}F]-FES PET was previously described in patients with metastatic lobular breast cancer.⁸ This case demonstrated the added value of [^{18}F]-FES PET for detecting ER-positive brain metastases.