



Published in final edited form as:

Clin Nucl Med. 2022 January 01; 47(1): e47–e48. doi:10.1097/RLU.0000000000003828.

Positive Multifocal PSMA PET/CT in a Patient With Prostate Cancer and Follicular Lymphoma

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Abstract

Prostate-specific membrane antigen (PSMA) PET/CT is a highly reliable nuclear tracer for diagnostic imaging of prostate cancer. However, PSMA is also expressed by some nonprostatic tissues such as benign tumors, inflammatory processes, and malignant neoplasms. This case presents a patient with prostate cancer and follicular lymphoma undergoing PSMA PET/CT. Remarkably, both tumor entities were clearly detected in the scan. Yet, the 2 malignancies demonstrated rather different ranges in terms of SUV_{max} uptake values and therefore still enabled precise and accurate discrimination of prostate cancer and follicular lymphoma.

Keywords

PSMA PET/CT; prostate cancer; follicular lymphoma

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Authors' contributions: K.D., A.M., and F.L.G. contributed to the data selection and interpretation. K.D. and A.M. drafted the work. C.Kr., P.L.C., C.Kl., J.C., and U.H. substantively revised the manuscript. All authors read and approved the final manuscript.

Conflicts of interest:

The remaining authors declare no conflicts of interest.

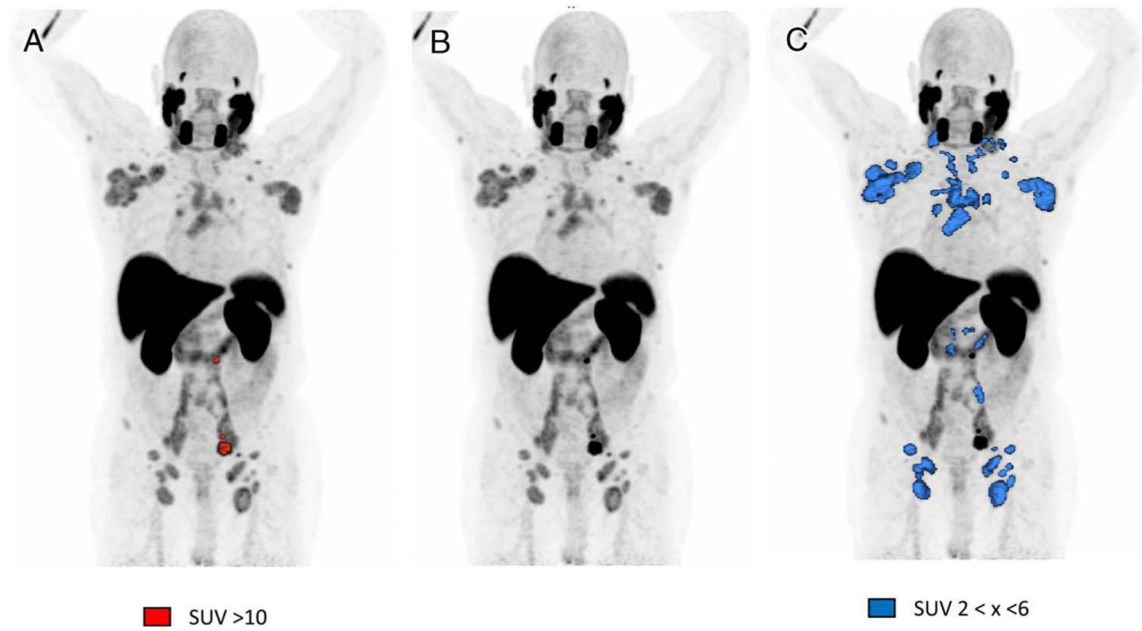
Ethics approval and consent to participate: The radiopharmaceutical was used on an individual patient basis according to German Pharmaceuticals Act §13 (2b). The patient gave written informed consent to receive the novel diagnostics and permitted anonymized publication of related medical data. The ethical committee of Heidelberg University approved this retrospective evaluation to be in accordance with the Helsinki declaration. For case reports from clinical practice, no trial registration is required.

Sources of funding:

Patent application for PSMA-1007 for F.L.G., U.H., and J.C. and for PSMA-617 for C.Kr. and U.H. F.L.G. is an advisor at SOFIE Biosciences, Telix, and ABX pharmaceutical.

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**FIGURE 1.**

Prostate-specific membrane antigen (PSMA) is overexpressed by prostate epithelial cells.^{1,2} However, moderate or even high PSMA expression can also be observed in a variety of conditions including inflammatory processes, benign tumors, and malignant neoplasms.^{3,4} This image depicts a case of a 79-year-old man with a previously treated histologically confirmed prostate cancer (10/2015) referred for a ^{18}F -PSMA-1007 PET/CT due to a rising PSA value (3.96 ng/mL) after definitive radiotherapy in 2016 (GSc 7b, pT1c, iPSA 6.0 ng/mL). In November 2018, follicular non-Hodgkin lymphoma (IIa Ann Arbor) was additionally diagnosed in a CT scan and histologically confirmed by lymph node excisional biopsy. A follow-up ^{18}F -PSMA-1007 PET/CT scan (07/2020) unveiled a relapse of the prostate carcinoma with 2 lymph node metastases located in the left paravesical space (SUV_{max} , 19.2) and left para-aortic space (SUV_{max} , 15.3), as well as 1 bone metastasis in the left sacrum (SUV_{max} , 15.4), all highlighted in **A**. Remarkably, the scan also clearly demonstrated moderate PSMA uptake in the follicular lymphoma, presented as large symmetric lymph nodes with an apparent worsening to Ann Arbor III. The SUV_{max} of the delineated lesions ranged from 2 to 6 (**C**). Thus, in this special case, both prostate cancer and follicular lymphoma emerged as PSMA positive. In terms of SUV_{max} , the follicular lymphoma showed rather moderate uptake values when compared with the prostate cancer lesions. Therefore, a precise identification of each disease can, in accordance with the SUV value, be performed based on the Syngo via MM Oncology VB50 (**A–C**). This case demonstrates that PSMA-positive lesions may not be due to prostate cancer alone, and thus different diagnoses should be considered in atypical cases as well.³ Nevertheless, apart from occasional challenges with other neoplasms, PSMA PET/CT remains a highly reliable and precise tracer for diagnosing and monitoring of prostate cancer.^{5–8}