

Detection of a Liver Metastasis by Breath-hold FDG-PET/CT Not Visible on Standard PET/CT

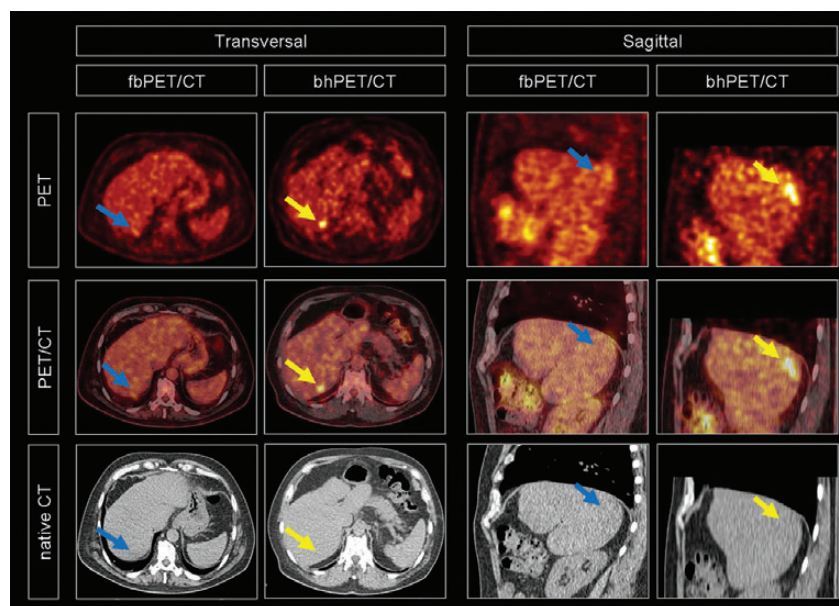


Figure 1.

Contrast-enhanced magnetic resonance imaging (ceMRI) was performed in a 62-year-old male patient with a history of colorectal cancer (CRC), with evidence of a 3.0 cm lesion in segment 7 of the liver, near to the diaphragm. To exclude extrahepatic disease a routine PET/CT with 263 MBq ^{18}F -fluorodeoxyglucose (FDG) was performed in free breathing (fbPET/CT). The liver lesion suspected at MRI was neither detectable at fbPET/CT nor at ceCT and native CT, thus additional PET/CT images were acquired via a single deep-inspiration breath-hold PET/CT (bhPET/CT). The patient was instructed to hold his breath as long as possible and he accomplished 40 s. At bhPET/CT the liver lesion showed a markedly increased signal compared with fbPET/CT, with a maximum standardized uptake value (SUVmax) of 12.4 versus 4.2. Although no histopathological analysis was performed, metastasis was regarded as the most probable cause because several lung and liver metastases had been resected before. Moreover, clinical follow-up revealed enlargement of the lesion as well as new liver and lung metastases despite chemotherapy treatment. bhPET/CT has been used in different tumor entities, especially lung cancer. While the influence of respiratory motion by abdominal organs remains to be fully investigated, the breath-hold technique is quick, easy to perform and able to provide higher SUVmax values. Notably, in lung imaging bhPET/CT has also been able to show additional lesions that had remained undetected with fbPET/CT. To our knowledge, however, this phenomenon had not yet been reported in liver lesions. The present case is remarkable in that a liver metastasis was diagnosed at all by bhPET/CT. A broader application of this technique requires that possible disadvantages are carefully considered, for example the additional radiation exposure due to low-dose CT examination or the poor signal-to-noise ratio caused by limited scanning time, the latter depending on the patients' ability to hold their breath.

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doi:10.1093/jjco/hyu098

Acknowledgements

Dr. Ernesta Palombo-Kinne is gratefully acknowledged for language assistance with the manuscript.