

PET/MR can effectively diagnose cause of unclear foot pain

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A single scan could diagnose the cause of foot pain better and with less radiation exposure to the patient than other methods, according to a study in the March 2015 issue of *The Journal of Nuclear Medicine*. Imaging with 18F-fluoride positron emission tomography/magnetic resonance imaging (PET/MR), compared to 18F-fluoride positron emission tomography/computed topography (PET/CT), provides more diagnostic information with higher diagnostic certainty.

Foot pain is a common problem in the daily routine of any orthopedic surgeon. It can be a clinical symptom of many different issues, from stress fractures to tumors. Multiple imaging modalities are available to help diagnose specific types of [foot pain](#), but no one modality is useful for effectively diagnosing a wide range of causes. Imaging with 18F-fluoride PET is highly sensitive tool but has low specificity for detection of metabolically active benign bone disease, while MR imaging provides excellent soft-tissue contrast and high resolution which helps in specifying a diagnosis. Thus, combined, PET/MR can offer an important tool for the sensitive diagnosis of foot pathologies.

In "Evaluation of 18F-Fluoride PET/MR and PET/CT in Patients with Foot Pain of Unclear Cause," researchers compared the quality and diagnostic performance of 18F-fluoride PET/MR to those of 18F-fluoride PET/CT in 22 patients for whom the specific diagnosis was inconclusive after clinical examination and radiography. The results of overall image quality showed that PET/MR was significantly superior to PET/CT, with an overall excellent image quality score of 3.0/3 points in

all PET/MR datasets, while PET/CT achieved 2.3 out of 3 possible points.

"In our study, 18F-fluoride PET/MR provided more diagnostic information at a higher diagnostic certainty compared to 18F-fluoride PET/CT in patients with foot pain of unclear cause," states Isabel Rauscher, corresponding author of the study. "Besides information on bone metabolism, it provides additional diagnostic relevant findings from soft-tissue and bone marrow pathology (e.g., bone marrow edema, ganglion cysts or tenosynovitis) compared to PET/CT." Also, since MR involves no radiation and the scan allows a longer PET acquisition time, the patient's exposure is lower than with CT.

Provided by Society of Nuclear Medicine

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