To the Editor:

With great interest we read the article by Hara et al regarding the potential role of $^{18}$F-fluorodeoxyglucose positron emission tomography/computed tomography (FDG-PET/CT) in the diagnostic management of suspected recurrent ipsilateral deep vein thrombosis (DVT).1 The latter diagnosis is complicated by critical limitations to current diagnostic techniques, mainly owing to persistent postthrombotic abnormalities after a first DVT. Hence, novel techniques that may overcome these limitations are urgently needed.

Although the presented data are encouraging for FDG-PET/CT as a potential diagnostic test for recurrent DVT, several critical questions remain unanswered, in part, because of the retrospective nature of the clinical part of their study: (1) how fast after appearance of new clinical DVT symptoms will the signal become positive? (2) what is the optimal signal threshold to confirm recurrent DVT and how do sensitivity and specificity relate at this threshold? and (3) is FDG-PET/CT feasible in clinical practice as a diagnostic test for an acute vascular disease considering the conditions required for this type of scan (necessary fasting period of 6 hours, and >1 hour subsequent waiting and scanning time after isotope administration)? We would like to draw attention to an alternative novel imaging technique for the indication of recurrent ipsilateral DVT, as mentioned by the authors (ie, magnetic resonance direct thrombus imaging [MRDTI]), which has reached an advanced stage of development and is close to implementation in clinical practice. In addition to this developmental lead, MRDTI has practical advantages over FDG-PET/CT.

The method is based on the measurement of a shortening T1 signal as a result of the formation of methemoglobin in a fresh thrombus.2,3 It does not require the injection of potential nephrotoxic contrast dye and takes ≈15 minutes to perform. For a first DVT, both the diagnostic accuracy (sensitivity, 97%–100%; specificity, 100%), and the interobserver agreement, as well, were reported to be excellent (κ=0.89–0.98).4 In a study of 43 patients with a first episode of DVT, it was shown that the high direct thrombus imaging signal extinguished completely over a period of 6 months.5 In the subsequently performed RETURN study, it was shown that MRDTI differentiated accurately between patients with confirmed recurrent ipsilateral DVT and those with asymptomatic residual intravascular clots and a normal d-dimer level: sensitivity and specificity were 95% (95% confidence interval, 83%–99%) and 100% (95% confidence interval; 92%–100%), respectively.5 Also, the high interobserver agreement was confirmed (κ=0.98).5

Based on these studies, we hypothesize that MRDTI has equally high sensitivity, but superior specificity in comparison with the current available ultrasonography techniques in this setting, and, from our experience, is logistically feasible to be used in day-to-day practice. To confirm this hypothesis, we will soon start with a prospective, multicenter management study, entitled advanced diagnostic management of suspected recurrent ipsilateral deep vein thrombosis of the leg with magnetic resonance direct thrombus imaging (Theia study), in which 305 patients with suspected ipsilateral recurrent DVT will be managed based on the result of MRDTI only, performed within 24 hours of clinical presentation (ClinicalTrials.gov. Unique identifier: NCT02262052). All patients will be followed for the occurrence of symptomatic venous thrombosis during a 3-month follow-up. In addition, the cost-effectiveness and feasibility of MRDTI in clinical practice will be addressed.

Disclosures

None.

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References


Letter by Klok et al Regarding Article, "18F-Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography Enables the Detection of Recurrent Same-Site Deep Vein Thrombosis by Illuminating Recently Formed, Neutrophil-Rich Thrombus"
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