

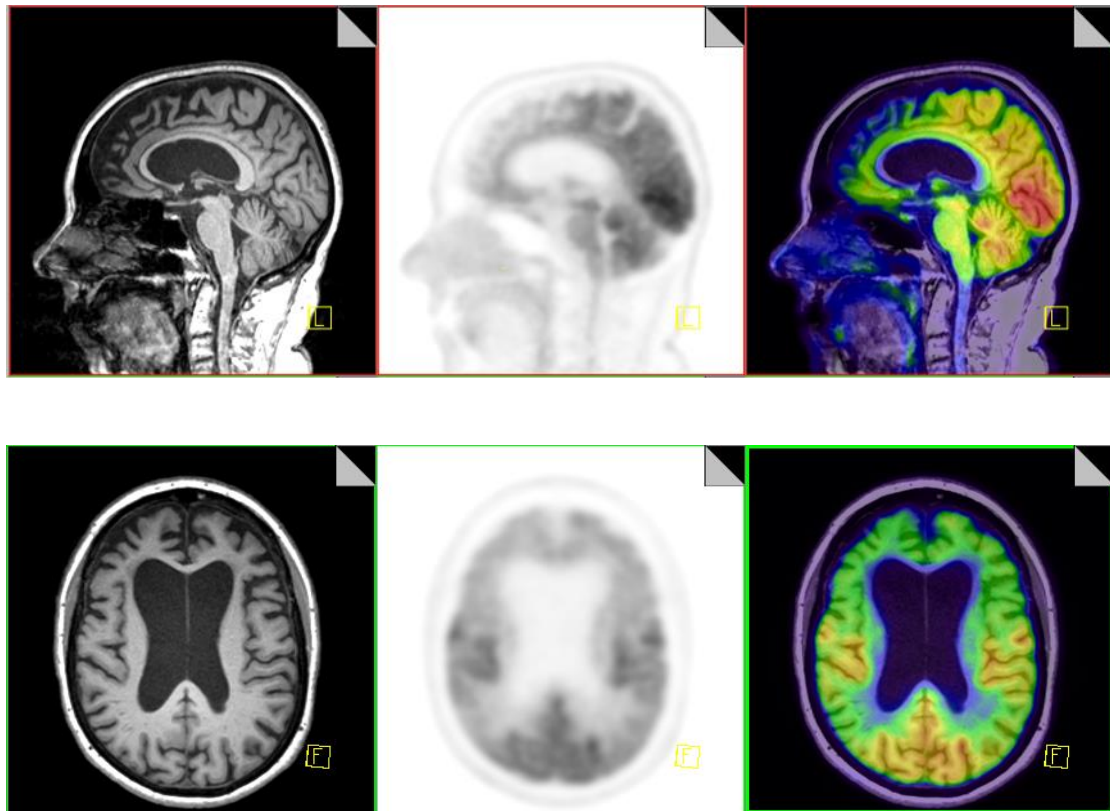
Simultaneous PET-MRI in Frontotemporal Dementia

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A 64-year-old female presented with a three-year history of behavioural change characterised by apathy, emotional blunting and hyperorality. Initial MRI and neuropsychometric data were consistent with a diagnosis of probable behavioural variant frontotemporal dementia (bv-FTD)¹. Scan acquisition on an integrated PET-MRI scanner provides simultaneous visualisation of atrophy and hypometabolism in degenerative dementia. The above triptychs represent sagittal (top) and axial (bottom) views of simultaneously acquired 3T MRI and FDG-PET. The combined images show the co-localisation of atrophy and hypometabolism in the frontal lobe and anterior cingulate gyrus (top right) as well as parietal hypometabolism without associated atrophy (bottom right).

In this patient these scans highlight not only the anterior co-localisation of structural and functional change but also demonstrate parietal hypometabolism without associated atrophy, possibly reflecting the disruption of fronto-parietal connections in bv-FTD².

In the diagnosis of degenerative dementia, the combination of PET and MRI provides greater diagnostic sensitivity and specificity than either modality alone³. However until recently such multimodal imaging required imaging on separate scanners with subsequent co-registration of

images. The recent availability of integrated PET-MRI scanners⁴ removes these operational limitations; furthermore the simultaneous acquisition of scan data permits evaluation of the inter-relationships between dynamic variables, such as perfusion, metabolism and function, without temporal confounds.

Worldwide availability of integrated PET-MRI scanners at present is scarce and these scans are among the first to be undertaken in patients with dementia. These images provide a glimpse of near-future imaging technology and highlight the added value of simultaneous multimodal imaging in dementia diagnosis.

References:

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