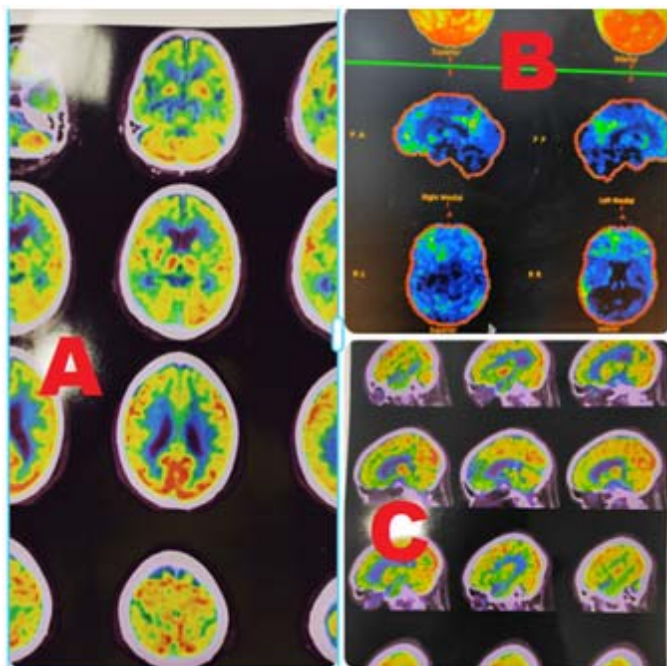# Pictorial CME

Dementia and PET Scan of Brain

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PET-CT (Positron Emission Tomography CT) of brain has now emerged as an important diagnostic tool for dementia. There are two patients with varying degrees of dementia and altered behaviour. Their PET-CT of brain (FDG: 18-Fluorodeoxyglucose) are shown below :

Patient 1 : 75-year-old male, recent onset behaviour alteration and memory loss. He had significant social disinhibition. However, he was a voracious crossword puzzle solver and that ability seemed unaffected. MMSE-24/30 (Attention more affected)

Patient 2 : 80-year-old female, gradually progressive memory loss. MMSE-21/30 (recall severely affected)

Questions :

(1) What is the diagnosis in Case 1 ?
(2) What is the diagnosis in Case 2 ?

Answers :

(1) In this Patient 1, we can see hypometabolism in the frontal and temporal lobes. In addition, there is hypometabolism in posterior cingulate gyrus (Panel B). This pattern is suggestive of fronto-temporal dementia (FTD). The hypometabolism in frontal lobes was more, compared to the temporal regions (Panel A). This is expected, as per the clinical presentation of the patient (behavioural variant of FTD). Had this been the semantic variant of FTD, temporal atrophy would have been more.

Reference : Jeong Y, Cho SS, Park JM, Kang SJ, Lee JS, Kang E, *et al* — 18F-FDG PET findings in frontotemporal dementia: an SPM analysis of 29 patients. *J Nucl Med* 2005; **46(2):** 233-9.

(2) In this image, we can see hypometabolism and decreased FDG uptake in bilateral parieto-temporal region in an asymmetric fashion (more on left). FDG uptake in frontal lobes is normal. In panel B of this figure, we can see prominent areas of decreased activity in temporal region and cingulate gyrus. This pattern of activity is suggestive of Alzheimer's disease. That is why, in the MMSE, memory functions are more affected.

Reference : Marcus C, Mena E, Subramaniam RM — Brain PET in the Diagnosis of Alzheimer's Disease. *Clin Nucl Med* 2014; **39(10):** e413-26.
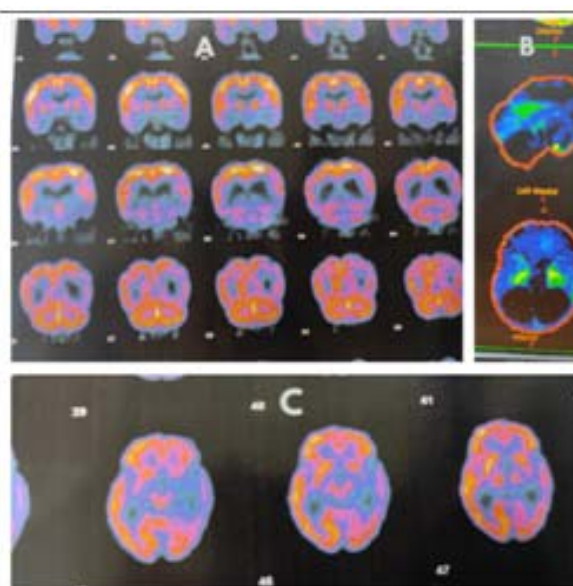
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