67 year-old female
Memory deficit, executive dysfunction, behaviour change

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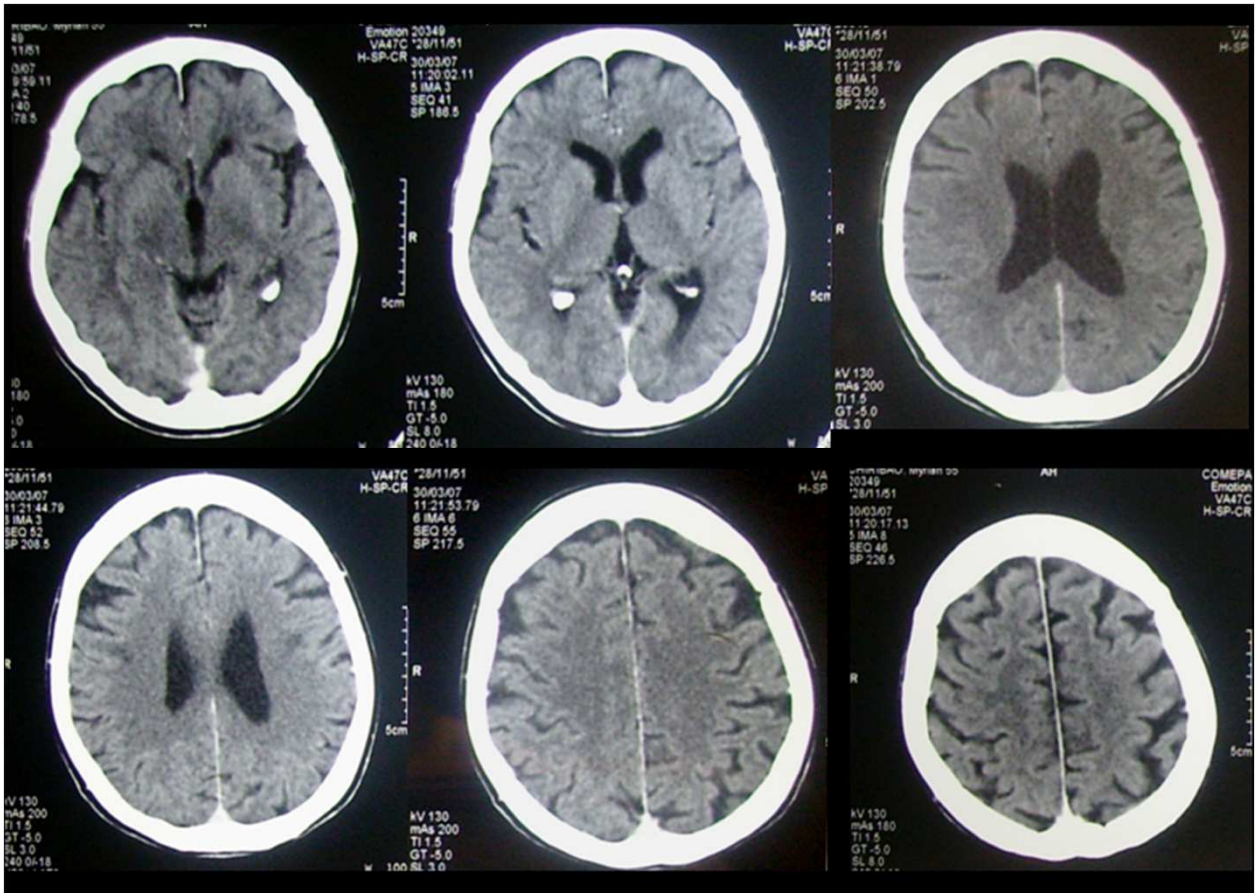
Clinical statement

- 67 y/o female.
- Hypertension, diabetes.
- Cognitive impairment 2 years of evolution.
- Memory deficit, executive dysfunction, behaviour change, lack of inhibition, constructional apraxia.
- Normal laboratory tests: T3/T4/TSH, VB12/folic acid, HIV, VDRL, ANA/ANCA.



CT scan. Atrophy with frontal predominance.
No other abnormal findings.

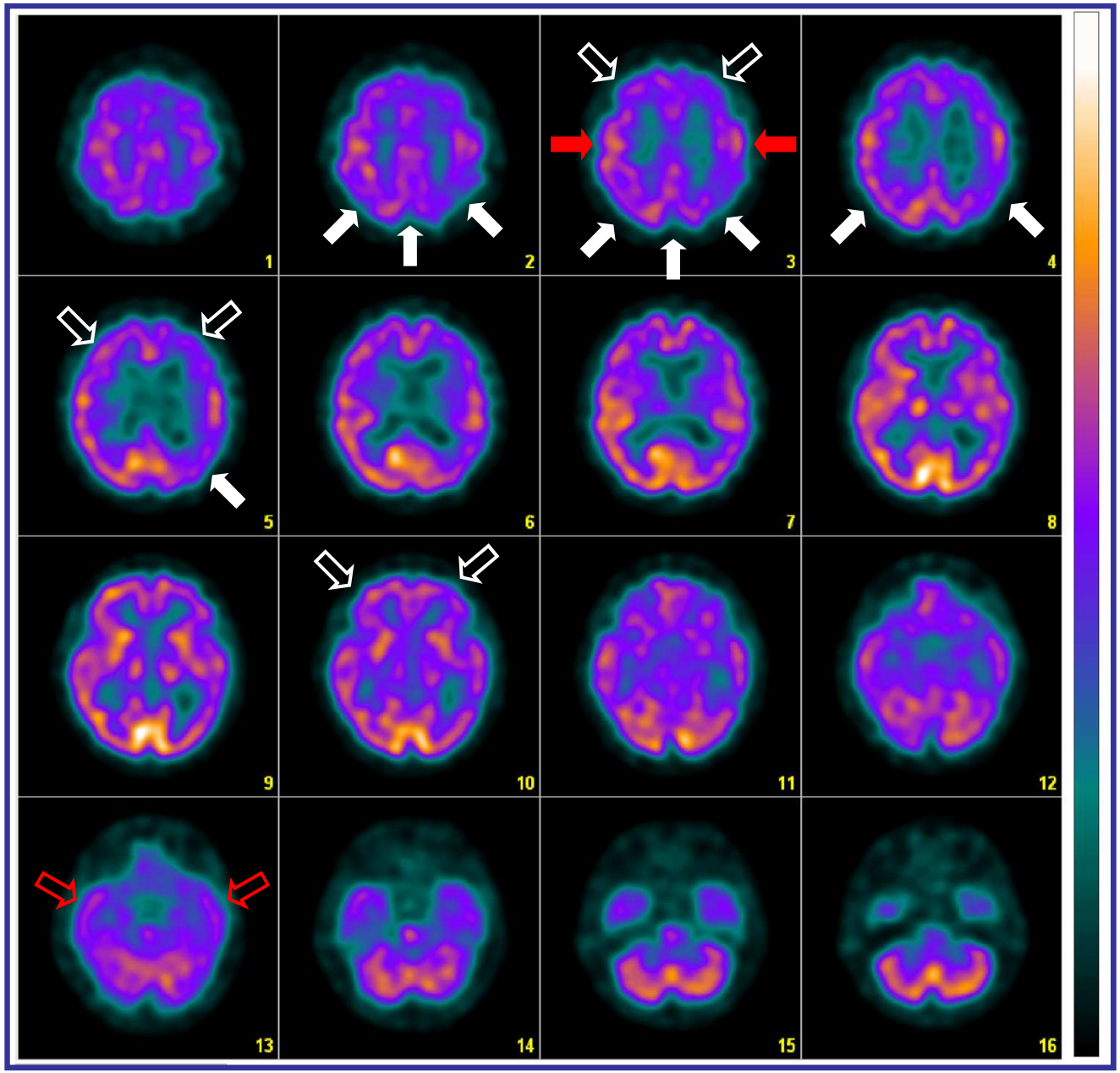
- Brain SPECT is indicated for further evaluation in a patient with clinical diagnosis of dementia with coexistent clinical criteria for AD and frontotemporal dementia (FTD).

- Images were acquired in a dual head gammacamera 60 min. p.i. of 99mTc-ECD (925 MBq).

- 128 steps, 25 seconds each. 128×128 matrix. 2.9 mm pixel size. No scatter correction was performed.

- OSEM reconstruction (5 cycles 2 subsets). Prefiltering with Butterworth order 10, cut-off frequency 0.25. Attenuation correction 12 cm-1. Transaxial slices parallel to AC-PC line.

Bilateral posterior parietal, left posterior temporoparietal, bilateral precuneus-posterior cingulate hypoperfusion (white arrows). Bilateral temporal (red) and prefrontal (white) hypoperfusion. Preservation of primary sensoriomotor (red) and occipital cortex, basal ganglia, thalami and cerebellum



Interpretation

- Images are consistent with AD.

Discussion

- FTD incidence is higher in young patients but AD is still more prevalent than FTD in patients with early onset dementia.
- Posterior cortical involvement greater than frontal involvement is typical of AD. As the disease progresses frontal hypoperfusion increases. Posterior parietal cortex is usually hypoperfused in FTD but intensity is mild.
- Posterior mesial cortical involvement (precuneus and posterior cingulate gyrus) is also a feature of AD. Posterior cingulate is usually affected (not always) in AD but almost always spared in FTD.
- Temporal involvement is also greater in AD, specially in mesial structures.

Conclusion

- Brain SPECT is indicated in the differential diagnosis of AD and FTD when clinical criteria for both diseases coexist.
- Balance between anterior and posterior cortical abnormalities, posterior cingulate hypoperfusion and mesial temporal involvement are useful features to distinguish between both entities in SPECT images.

Teaching points

- Brain SPECT in the differential diagnosis of dementia
- Dysfunctional patterns that distinguish AD from FTD

References

- Devous MD Sr. Functional brain imaging in the dementias: role in early detection, differential diagnosis, and longitudinal studies. Eur J Nucl Med Mol Imaging. 2002;29(12):1685-96.
- Bonte FJ, Harris TS, Roney CA, Hynan LS. Differential diagnosis between Alzheimer's and frontotemporal disease by the posterior cingulate sign. J Nucl Med. 2004;45(5):771-4.