

64 year-old male

History of epileptic seizures

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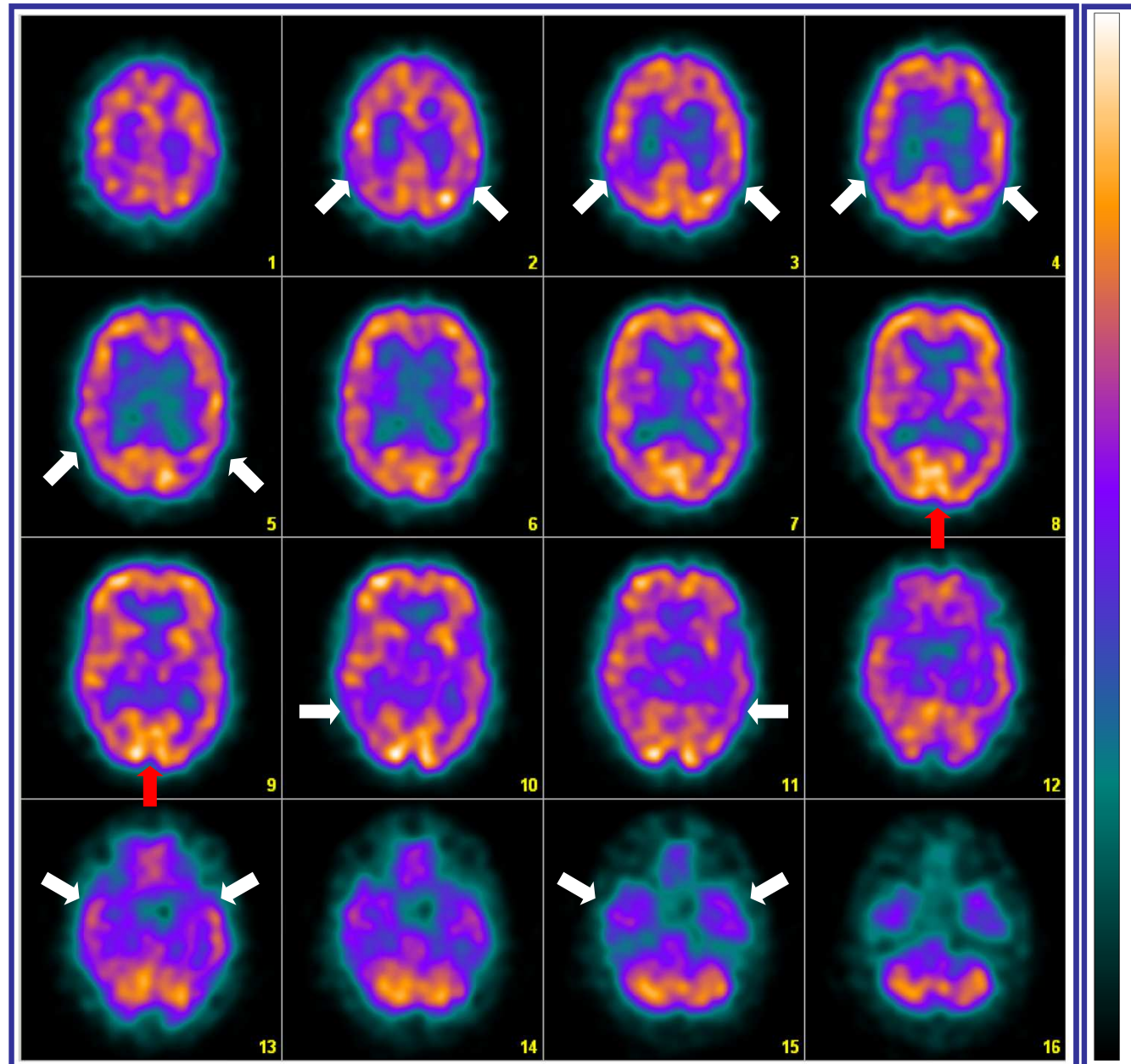


Clinical statement

- 64 y/o male
- Hypertension
- History of epileptic seizures
- Tremor. Parkinsonism diagnosed 2 months ago.
- Cognitive impairment frontal sub-cortical profile
- Depressive symptoms
- CT: Small widespread white matter infarctions. Atrophy.
- Lewy body disease?

- Brain SPECT is indicated for further evaluation in a patient with dementia with one core criteria for LBD diagnosis and other possible causes of cognitive impairment.
- Images were acquired in a dual head gammacamera 60 min. p.i. of ^{99m}Tc -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, temporo-parieto-occipital and temporal hypoperfusion (white arrows). Bilateral prefrontal and temporal hypoperfusion. (white). Less intense thalamic and basal ganglia hypoperfusion. Relative preservation of primary occipital cortex (red)



Interpretation

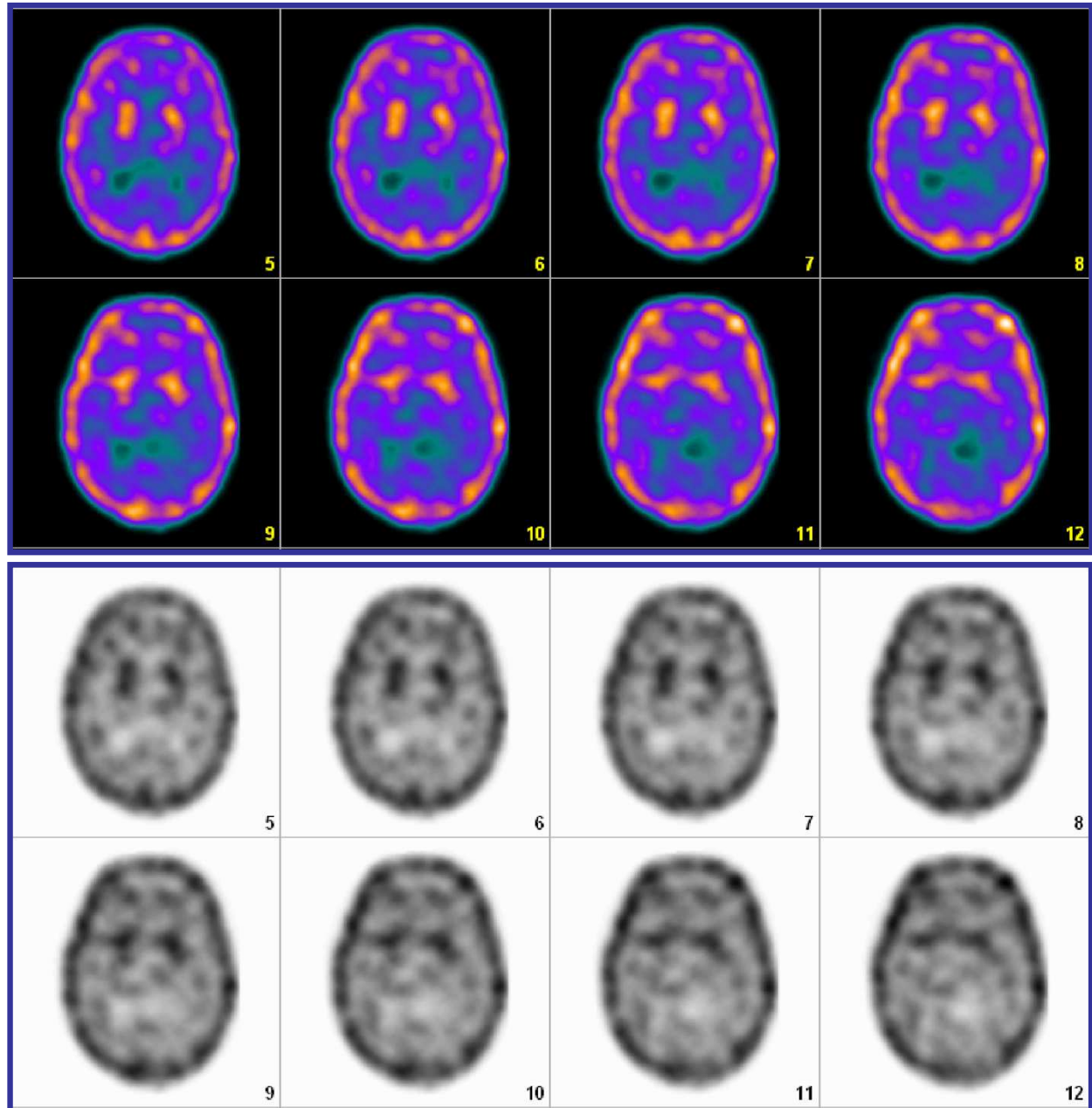
- Pattern suggests AD
- DAT imaging is recommended

- ^{99m}Tc -TRODAT-1 SPECT.
- Images were acquired in a dual head gammacamera 4 hs p.i. of 925 MBq.
- 128 steps, 30 seconds each. 128×128 matrix. 3.5 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} .
- Quantification of specific uptake ratios with ROIs over striatum and occipital cortex. $\text{SUR} = (\text{striatum mean counts} / \text{occipital mean counts}) - 1$.

Color (top) and gray
(bottom) scale
transaxial slices.

SUR:

- Right striatum= 1.26
- Left Striatum=1.21



Interpretation

- Normal study (visual interpretation and bilateral SUR)
- Result supports AD

Discussion

- Thalamic and basal ganglia hypoperfusion probably related to vascular disease
- No suggestive features of LBD. Primary occipital cortex is preserved.
- Parkinsonism probably due to sub-cortical vascular disease
- DAT SPECT is usually abnormal in LBD and normal in AD
- Vascular disease and recent onset parkinsonism make the diagnosis of LBD less likely.

Conclusion

- Brain perfusion SPECT can help in the diagnosis of LBD, mainly if primary occipital involvement is present. It has been incorporated as a supportive criteria in the last revision of the LBD Consortium guidelines (2005).
- Low dopamine transporter striatal uptake is considered a suggestive criteria of LBD (higher diagnostic relevance).
- None of this imaging features are present in this patient.

Teaching points

- Brain perfusion SPECT in the diagnosis of LBD
- DAT SPECT in the diagnosis of LBD

References

- McKeith IG, Dickson DW, Lowe J, et al. Diagnosis and management of dementia with Lewy bodies: third report of the DLB Consortium. *Neurology*. 2005;65(12):1863-72.
- Walker Z, Costa DC, Walker RW, et al. Differentiation of dementia with Lewy bodies from Alzheimer's disease using a dopaminergic presynaptic ligand. *J Neurol Neurosurg Psychiatry*. 2002;73:134-40.
- Tatsch K. Imaging of the dopaminergic system in differential diagnosis of dementia. *Eur J Nucl Med*. 2008;35 (Suppl 1):S51-S57.