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 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, temporoparieto-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
• 99mTc-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. SUR = striatum mean counts/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

