64 year-old female
Memory deficit of mesotemporal profile and mild cognitive impairment

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Clinical statement

- 64 y/o female.
- Hypertension.
- Cognitive impairment 2 years of evolution.
- Neuropsychological study: memory deficit of mesotemporal profile. Mild cognitive impairment.
- Normal CT scan
• Brain SPECT is indicated for further evaluation in patient under 65 years old with mild cognitive impairment suggestive of mild AD.

• 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. Reorientation to temporal long axis.
Transaxial slices:
Bilateral temporal hypoperfusion (white arrows).
Mild bilateral posterior parietal and posterior cingulate (thin white).
Mild bilateral medial prefrontal and right inferolateral frontal hypoperfusion (red).
Temporal long axis slices:
Bilateral temporal hypoperfusion is better delineated, mesial temporal involvement is more evident.

Sagittal slices:
Mild bilateral posterior cingulate hypoperfusion is better delineated (thin arrows). Mesial prefrontal involvement is also seen (white).
Interpretation

- Images are consistent with AD.
Discussion

- Temporal hypoperfusion with mesial involvement is present in AD and is the most evident finding in this patient, although more specific pattern consist of bilateral posterior parietal or temporoparietal changes.

- Posterior cortical pattern is usually seen in early stages. Deafferentation from parahippocampal cortex (directly connected to posterior cingulate), contributes to this feature.

- Posterior cingulate hypoperfusion is not always present in AD, but when present is a specific sign.

- Temporal long axis and sagittal slices are very useful to depict mesial temporal and posterior cingulate involvement.
Conclusion

• At least half of the patients with mild cognitive impairment will develop AD.

• Recognition of a dysfunctional pattern consistent with AD supports a progressive cognitive decline and can help implementing adequate treatment in early stages with possible impact on the course of the disease.

• Posterior parietal/temporoparietal w/wo posterior cingulate involvement is the most specific feature.

• Temporal hypoperfusion affecting mesial structures is also seen in AD, although less specific when present alone.
Teaching points

- Brain SPECT in mild cognitive impairment and mild AD
- Predictive patterns of progressive cognitive decline
References

