Multitracer study in Heidenhain variant of Creutzfeldt-Jakob disease: Mismatch pattern of cerebral hypometabolism and perfusion imaging

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Abstract

Creutzfeldt-Jakob disease (CJD) is a subacute spongiform encephalopathy. This fatal prion disease is characterized by rapidly progressive dementia with a variety of neurological disorders. Diagnostic methods provided by nuclear medicine might be helpful for evaluation of patients with probable CJD as additional diagnostic tools to MRI and cerebro-spinal fluid evaluation. The experience with FDG-PET and brain perfusion SPECT is presented.

Creutzfeldt-Jakob disease (CJD) is a subacute spongiform encephalopathy. This fatal prion disease is characterized by rapidly progressive dementia with a variety of neurological disorders. Typical abnormalities observed by MRI are described, additionally nuclear medicine multitracer studies can provide helpful information [1,2].

A 53-year-old female patient presented with acute onset of vision impairment, which was interpreted as occipital cortical stroke in line with clinical data and diagnostic imaging. Continually she developed cognitive deterioration, dysarthria and fatigue and was referred for re-evaluation to our neurological centre in January 2007.

99mTc-bicisate-SPECT (fig. 1a) detected a rather small defect on the left occipital cortex and only marked hypoperfusion was observed contra-laterally. The 18-F-FDG-PET images (fig. 1b), obtained the day before, showed a broad metabolic defect bilaterally on the occipital cortex, which extended to the temporal lobe on the left side. This pattern is not compatible with stroke aetiology, but also different to the matched decrease of blood flow and glucose utilization in CJD described by the literature [3].

Neuropathological evaluation of a brain biopsy then proofed the diagnosis of CJD (Heidenhein variant), which was reassured by autopsy in March 2007.

Nuclear medicine methods appear to be sensitive investigations in CJD and could be useful for differential diagnosis [4].

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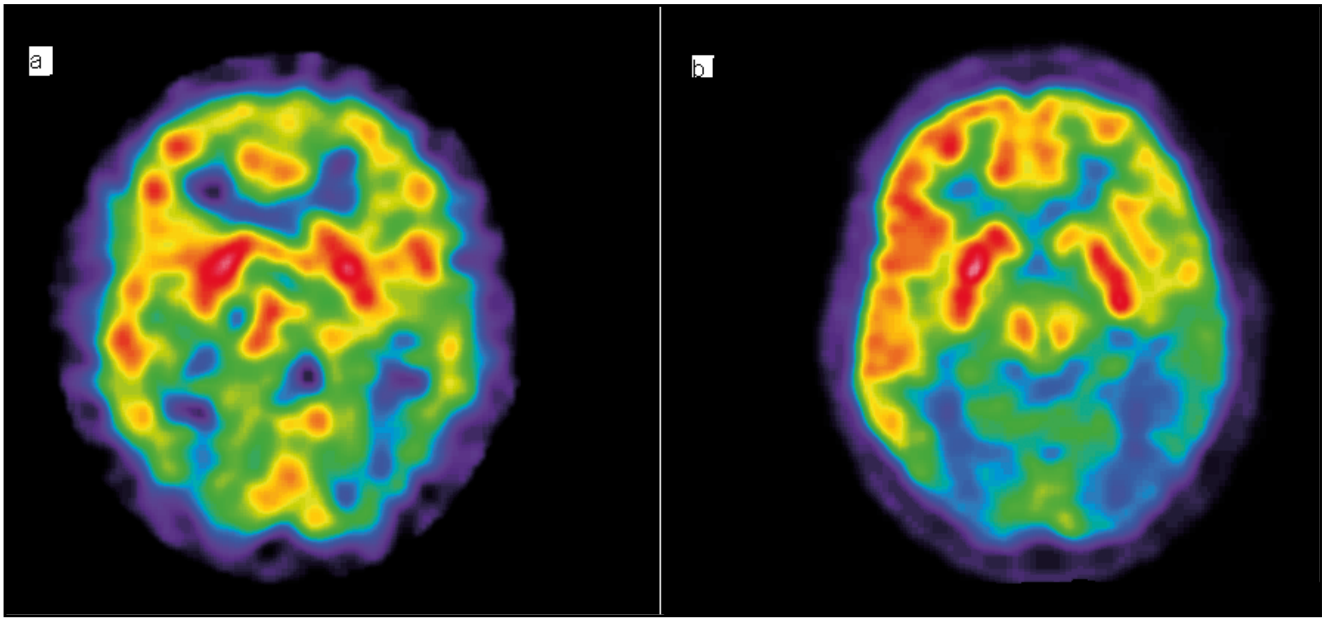

Figure 1. a) Brain perfusion imaging was obtained by 99m-Tc-bicisate-SPECT on an IRIX three-head gamma camera. A rather small perfusion defect on the left occipital cortex can be observed as well as an area of marked hypoperfusion contralaterally. b) For 18-F-FDG PET imaging we used a GEMINI GXL Philips PET/CT camera and a specified brain protocol and adjusted software provided by the manufacturer. A broad metabolic defect situated bilaterally on the occipital cortex was observed, which extended to the temporal lobe on the left side.

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