Longitudinal 18FDG-PET in Cerebellar Cognitive Affective Syndrome: Diagnostic and Prognostic Value

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Background and aims

Cerebellar cognitive affective syndrome (CCAS) is an increasingly recognized diagnosis, characterized by impairments in higher-order functions, including executive-attentive, visuospatial, linguistic, affective and behavioural domains, resulting from a cerebellar lesions [1]. The clinical course may vary depending on the underlying pathology. We present two cases of CCAS with distinct trajectories, documenting the evolution of clinical and metabolic imaging findings.

Materials and methods

Clinical diagnoses were supported by 18FDG-PET imaging and comprehensive neuropsychological evaluations. Patients were followed longitudinally over several years, with repeated clinical and nuclear imaging assessments to monitor disease progression.

Results

Case 1: a 71-year-old man with a history of bipolar disorder underwent surgical resection of a right cerebellar lesion (fig. 1). In the subsequent months, he developed memory impairment and behavioural changes. Neuropsychological evaluation revealed a dysexecutive syndrome with additional memory and attentional deficits. 18FDG-PET demonstrated cerebral diaschisis (fig. 2). Over the following years, obsessive behaviours emerged, and repeat 18FDG-PET demonstrated increased hypometabolism. Follow-up neuropsychological testing showed a worsening in attention, cognitive flexibility and problem-solving skills.

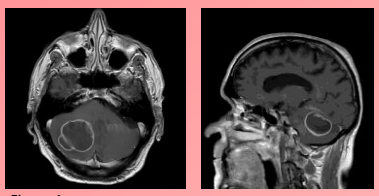

Figure 1

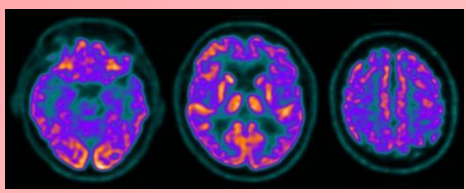

Figure 2

Case 2: a 57-year-old woman with major depressive disorder presented with psycho-organic deterioration. Brain MRI showed bilateral DWI hyperintensity along the corticospinal tracts, ventromedial thalami, and hippocampal cortex (fig 3). 18FDG-PET documented cerebellar hypermetabolism and cerebral hypometabolism (fig 4). Over the ensuing months, cognitive deficits and weight improved, but nystagmus and gait ataxia persisted, leading to a diagnosis of cerebellitis. A follow-up 18FDG-PET documented resolution of cerebellar hypermetabolism with mild residual cerebral hypometabolism. Neuropsychological evaluation identified persistent executive deficits despite clinical stability. Subsequent imaging was unchanged, while ataxia gradually progressed.

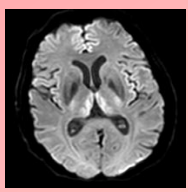

Figure 3

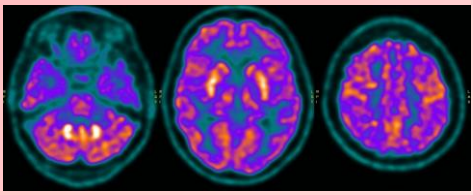

Figure 4

Discussion

Psychiatric comorbidities complicated the clinical presentation in both cases, highlighting the diagnostic value of 18FDG-PET. These cases illustrate how nuclear imaging findings evolve alongside clinical features. The first patient, who underwent surgical intervention, experienced persistent and progressive cerebellar hypometabolism and cognitive decline. The second patient, with acute inflammatory cerebellitis, showed transient cerebellar hypermetabolism and milder, stable cognitive deficits in the long term.

Conclusions:

These cases support a correlation between 18FDG-PET findings and clinical progression in CCAS. Further studies are warranted to confirm the utility of 18FDG-PET follow up in the longitudinal monitoring and prognostication of CCAS.

References

1. Schmahmann JD, Sherman JC. The cerebellar cognitive affective syndrome. Brain. 1998 Apr;121 (Pt 4):561-79. doi: 10.1093/brain/121.4.561. PMID: 9577385.

Disclosures