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Suspected very late-onset schizophrenia-like psychosis clinically diagnosed as cerebral amyloid angiopathy by susceptibility-weighted MRI sequencing: A case report.

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Abstract

Background: Very late-onset schizophrenia-like psychosis (VLOSLP) is a psychiatric disorder characterized by the onset of schizophrenia-like symptoms, including hallucinations and delusions, after 60 years old. VLOSLP diagnosis requires ruling out various organic causes, including neurodegenerative diseases such as dementia with Lewy bodies and cerebrovascular disorders, which may present with similar psychotic features. Herein, we report a case in which susceptibility-sensitive Magnetic Resonance Imaging (MRI) sequences, including T2*- and susceptibility-weighted MRI sequences, enabled the clinical diagnosis of Cerebral Amyloid Angiopathy (CAA) in a patient suspected of VLOSLP.

Case-Presentation: The patient was a woman in her 80's who exhibited memory impairments and visual hallucinations, such as perceiving inanimate objects as people and clothes in motion. Neurological examination revealed mild cognitive impairment and gait instability, with no other abnormalities. Neuropsychological testing indicated attention and visuospatial function deficits. Dopamine transporter single-photon emission computed tomography yielded findings inconsistent with dementia with Lewy bodies, and the relatively mild cognitive impairment indicated VLOSLP. T1- and T2-weighted brain MRI revealed no abnormalities; however, multiple cerebral microbleeds and superficial siderosis suggestive of CAA were detected on T2*-weighted imaging. To prevent the recurrence of cerebrovascular events, antihypertensive therapy was optimized, and anticoagulant medication was discontinued. The patient's symptoms persisted with some non-adherence to medication and pharmacological treatment with yokukansan and galantamine. Nevertheless, supportive care and environmental modifications led to gradual improvements post-discharge.

Conclusion: Unlike VLOSLP, CAA requires careful management to prevent recurrent cerebrovascular events, and non-pharmacological interventions are generally prioritized over pharmacotherapy in addressing associated psychiatric symptoms. This case underscores the importance of susceptibility-weighted MRI sequences in the clinical diagnosis of CAA in patients suspected of VLOSLP.

Keywords: Cerebral amyloid angiopathy, Visual hallucinations, Cognitive impairment, Superficial siderosis, Cerebral microbleeds, Alzheimer's disease

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Introduction

Very late-onset schizophrenia-like psychosis (VLOSLP) is a psychiatric disorder characterized by the appearance of schizophrenia-like symptoms after 60 years of age. Although schizophrenia is typically regarded as a disorder with onset in late adolescence or early adulthood, many patients are initially diagnosed in middle or old age [1]. The diagnosis of VLOSLP requires the exclusion of various organic conditions that can cause hallucinations and delusions, including neurodegenerative diseases, such as dementia with Lewy bodies and cerebrovascular disorders [2], as well as visual impairment-related syndromes, such as Charles Bonnet syndrome [3,4].

Cerebral Amyloid Angiopathy (CAA) is increasingly recognized as a cause of cerebral microbleeds and superficial siderosis, which may contribute to cognitive decline and neuropsychiatric symptoms [5,6]. CAA is relatively common, being reported in 28-38% of brains

in general autopsy series and in 55-59% of those with cognitive impairment [7]. The primary neuropsychiatric symptoms associated with CAA are irritability and apathy. Psychotic symptoms such as visual hallucinations and paranoid delusions are rare [6]. However, reports differentiating VLOSLP from CAA are scarce.

Herein, we present a case in which Susceptibility-Weighted magnetic resonance Imaging (SWI) sequences, including T2*-weighted imaging, enabled the clinical diagnosis of CAA in a patient exhibiting a clinical course suggestive of VLOSLP. This report highlights the importance of susceptibility-weighted imaging in the diagnostic evaluation of patients with suspected VLOSLP.

Case Presentation

An 80-year-old woman presented with recurrent episodes of memory loss and the misidentification of inanimate objects as human figures. Her medical history included hypertension, hyperlipidemia, and lumbar spinal canal stenosis. She was on multiple medications, including *Amlodipine, Valsartan, Bisoprolol, Clopidogrel, Limaprost, Alfadex, Atorvastatin, Rabeprazole,* and *Rebamipide*. The patient had no relevant family history but had a long history of alcohol use, consuming approximately 1050 mL of beer daily since her twenties; however, she ceased drinking in March 2024. She was a lifelong non-smoker and never married. She was the second of five siblings, previously employed in clerical work, and had been living alone on a pension.

Her symptoms began in November 2023, when she developed frequent forgetfulness and visual hallucinations, such as perceiving objects as people and seeing clothing moving independently. She frequently told her family, "I'm seeing Hallucinations-I can't go on living like this," and was sometimes tearful during phone calls. The patient visited our outpatient clinic in March and was admitted in April for further evaluation and management of persistent symptoms and anxiety.

Upon admission, she was alert and oriented, although she exhibited gait instability and occasional urinary incontinence. Neurological examinations revealed no cranial nerve abnormalities or extrapyramidal signs. Psychiatric evaluation revealed tense facial expressions and anxiety about living alone. She stated, "I don't want to burden my siblings any further." Her speech was loud and interactive, but her hair was unkempt, and her clothes were worn.

Laboratory tests, electrocardiography, and chest radiography revealed no abnormalities. A neuropsychological assessment during her outpatient visit in early April revealed deficits in attention and visuospatial abilities. Her scores were 28/30 on the revised Hasegawa Dementia Scale (HDS-R) and 25/30 on the Mini-Mental State Examination (MMSE).

Brain MRI revealed multiple punctate hypo intensities in the cortical and subcortical regions suggestive of cerebral microbleeds, amyloid deposition, and superficial siderosis. Mild atrophy of the bilateral temporal lobes and hippocampus was also observed (Figure 1). Dopamine Transporter Single-Photon Emission Computed Tomography (DAT SPECT) revealed no significant reduction in dopamine uptake in the bilateral striatum.

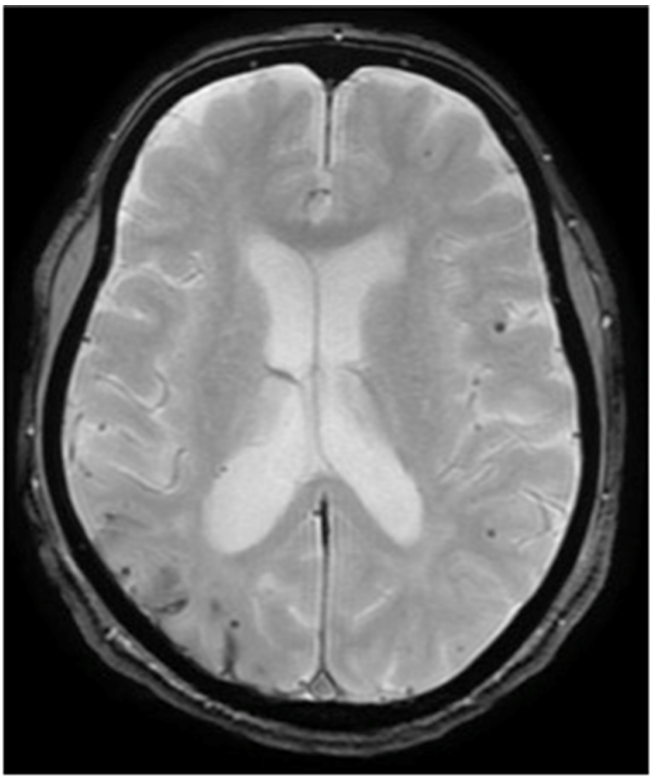

Figure 1. *Axial T2*-weighted MRI.*

During hospitalization, she continued to experience visual hallucinations, such as perceiving curtains as human legs, without diurnal variations. She further developed a dry cough attributed to the hospital environment and became increasingly irritable and distressed. Supportive care, rehabilitation, and environmental modification were initiated. On day 8, yokukansan, a traditional Kampo medicine, was prescribed to relieve anxiety; however, she could not tolerate the powdered formulation. Her anxiety was interpreted as part of the behavioral and psychological symptoms of dementia, and galantamine was consequently started on day 16. However, she developed paranoid delusions, exemplified by statements such as, "This cough is terrible-maybe someone is poisoning me," and began refusing medication.

Although she occasionally appeared calm and smiling while walking, she frequently expressed dissatisfaction with her physical symptoms and the hospital environment. On day 27 of hospitalization, the patient was discharged to prevent further functional decline.

After discharge, her condition improved. She resumed playing Mahjong, maintained contact with friends, and reported less loneliness. Her mood improved, and

her visual hallucinations diminished. Although she occasionally experienced unusual visual phenomena, she was able to manage these without experiencing significant distress.

Discussion

This case illustrates a rare presentation in which psychotic symptoms, namely visual hallucinations and paranoid delusions, that emerged in late life initially led to the suspicion of VLOSLP; however, susceptibility-weighted MRI sequences strongly suggested CAA, ultimately supporting its clinical diagnosis. The patient, aged > 75 years, demonstrated multiple cerebral microbleeds and cortical superficial siderosis predominantly in the posterior cortex on T2*-weighted imaging, with no hemorrhagic lesions in deep brain structures such as the basal ganglia, thalamus, brainstem, or cerebellum. According to the Boston criteria (version 2.0) [8], the findings were consistent with "probable CAA." Reports in which imaging plays a decisive role in differentiating VLOSLP from CAA are rare.

VLOSLP is a late-onset form of schizophrenia primarily characterized by positive symptoms, such as hallucinations and delusions, with relatively preserved cognitive function [1]. In the present case, the patient initially exhibited only mild cognitive impairment, while DAT SPECT did not reveal findings supportive of Lewy body disease, prompting the consideration of VLOSLP as a possible diagnosis.

However, the presence of numerous cortical and subcortical microbleeds and superficial cortical siderosis on T2*-weighted imaging strongly indicated CAA. Notably, cortical hemosiderin deposition is a characteristic feature of CAA, and its distribution differs from that of hypertensive microbleeds [8]. In the present case, there were no signs of hemorrhage in the basal ganglia or other deep structures, and the distribution pattern favored CAA. Although psychotic symptoms such as hallucinations and delusions are uncommon in CAA, such presentations have been previously reported [6]. The fact that visual hallucinations were the initial symptom in this case highlights the importance of differentiating CAA from dementia with Lewy bodies, with SPECT imaging contributing to the exclusion of the latter.

In terms of treatment, pharmacological interventions such as yokukansan and galantamine were ineffective and appeared to exacerbate medication refusal through the development of paranoid delusions. In contrast, supportive care and environmental modifications led to clinical improvements. In CAA, where no established pharmacological treatment exists to prevent recurrent hemorrhage or delay cognitive decline, non-pharmacological interventions represent a crucial therapeutic option [9,10].

This study has several limitations. First, as the patient had lived alone for many years, background information such as lifestyle history was obtained solely through self-reporting. Although she had a long history of alcohol consumption, the reported amount relied entirely on her statements and could not be independently verified. Second, although the MRI findings were consistent with multiple CAA-related pathologies and raised the possibility of an underlying Alzheimer's disease pathology, neither amyloid PET imaging nor cerebrospinal fluid testing was performed, leaving the presence of AD pathology unconfirmed.

The significance of this case lies in its demonstration that susceptibility-weighted MRI sequences can reveal the covert cerebrovascular pathology underlying psychotic symptoms in elderly patients initially suspected of having VLOSLP. In Japan, current clinical guidelines, such as the Schizophrenia Pharmacotherapy Guidelines [11], recommend brain CT or MRI as part of the differential diagnosis but do not specify which particular imaging sequences should be conducted. Susceptibility-weighted MRI sequences should be considered in the diagnostic workup of elderly patients suspected of having VLOSLP, and wider adoption of these sequences is warranted.

Conclusion

This case represents a rare instance in which visual hallucinations and paranoid delusions emerging in late life initially suggested VLOSLP; however, susceptibility-weighted MRI sequences enabled the clinical diagnosis of CAA. Although VLOSLP and CAA share overlapping clinical features, they differ significantly in their pathophysiology, prognosis, and treatment strategies. Therefore, accurate differentiation between the two is essential. MRI sequences sensitive to magnetic susceptibility, such as T2* and SWI, should be considered important tools in the differential diagnosis of elderly patients suspected of having VLOSLP.

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Author's Contribution

Kentaro Uchida served as the primary physician for the patient and was the main author of the manuscript, drafting the initial version and organizing the case details. Jumhythmia Maruta and Hideo Kurozumi reviewed the content of the case reports and contributed to the writing process. Inoue provided critical reviews and expert advice to ensure the accuracy and completeness of the final manuscript. All authors have reviewed and approved the final version of the manuscript.

Declaration of Interest

The authors declare that they have no conflicts of interest.

Ethical Considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki. Informed consent was obtained from the patient for the publication of this case report.

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