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Case Presentation

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Diagnosis and Treatment of Temporal Lobe Epilepsy Led to the Cure of Persecutory Delusions Including Olfactory Hallucinations in an Older Patient Lacking Insight and Living Alone: A Case Report

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Abstract

We present the case of an older female living on her own who was successfully treated for persecutory delusions and olfactory hallucinations via treatment for temporal lobe epilepsy. Her main complaints were that her neighbor was punching the walls and directing foul odors into her home. She had poor insight into her olfactory hallucinations and persecutory delusions. There were no associated episodes of impaired consciousness, but electroencephalography demonstrated reproducible sharp waves of right temporal origin indicating temporal lobe epilepsy. After diagnosing temporal lobe epilepsy and

prescribing levetiracetam, the patient's persecutory delusions disappeared. It is suggested that, as in the present case, patients with temporal lobe epilepsy may lack insights in olfactory hallucinations (may perceive the olfactory hallucinations as real) when combined with persecutory delusions. Persecutory delusions about neighbors among older individuals who live alone are typical of very late-onset schizophrenia-like psychosis (VLOSLP); however, this case emphasizes that it is important to consider the possibility of temporal lobe epilepsy as a differential diagnosis when these symptoms are accompanied by complaints of olfactory hallucinations.

Keywords: Temporal lobe epilepsy; Hallucinations; Olfactory; Very late-onset schizophrenia-like psychosis; Community-dwelling older patient; Delusions; Persecutory

Abbreviations: (VLOSLP): Very Late-Onset Schizophrenia-Like Psychosis

Introduction

Persistent complaints of systematized persecutory delusions with associated hallucinations in socially isolated, cognitively normal older individuals have been reported as late paraphrenia [1], which is now classified as very Late-Onset Schizophrenia-Like Psychosis (VLOSLP) [2]. Even when adjusted for age and mortality rates, VLOSLP is associated with a higher risk of social dysfunction, i.e., the inability to develop and maintain social relationships, than early-onset schizophrenia, due to the greater likelihood of physical comorbidities and injuries suffered by these individuals [3]. Olfactory hallucinations have been reported to be caused by psychiatric disorders, mainly schizophrenia, and temporal lobe epilepsy [4-6]. It has been reported that patients suffering from olfactory hallucinations associated with schizophrenia lack insight and that these patients may engage in behaviors such as closing windows in the house to prevent unpleasant odors from penetrating [7]. In contrast, olfactory hallucinations associated with temporal lobe epilepsy have been reported to appear as an aura of epileptic seizures, and patients retain insight regarding these hallucinations [7]. To the best of our knowledge, no other report has focused on whether the patient

retains insight or not in olfactory hallucinations caused by temporal lobe epilepsy. We present a case in which the diagnosis and treatment of temporal lobe epilepsy in an older community-dwelling patient living alone led to the cure of her delusions of persecution, including the olfactory hallucinations for which she was lacking insight. This case shows that patients with temporal lobe epilepsy can lack insight regarding their olfactory hallucinations and, thus, highlights the importance in differentiating between temporal lobe epilepsy and VLOSL in older individuals suffering from persecutory delusions.

Case Presentation

The patient in the present case was a right-handed 77-year-old woman who visited our psychiatric outpatient clinic. Her chief complaints were that her neighbor was punching the wall and sending fecal odors into her home. Clinical history was obtained from the patient and her son, who had accompanied her to our clinic. When the woman in her twenties, she lived in rented apartments with her two children. At that time, the patient had felt harassed by the resident on the floor below who would ban on the ceiling at the slightest noise, and she was hospitalized for a stress-related stomach ulcer. Due to this trouble, she became very careful about her daily life noise exposure. At the age of 55, she suffered a subarachnoid hemorrhage and underwent a craniotomy for aneurysm clipping. Three years before her first visit to our outpatient clinic, she was widowed and had moved to her current rental house. The rent for the housing was low and the walls were thin so she could often hear her neighbors. Six months after moving in, she began to feel that her neighbor was harassing her. Around a year before the visit, she began to feel that her neighbor was punching her walls and purposely directing fecal odors into her apartment. The son explained that an odor would not be able to penetrate the structure of the apartment, but the patient was angry and would not accept this explanation. From that time, the patient became unusually thirsty before bed and would drink four cups of water instead of the usual one. The patient also began to complain directly to her neighbor, as well as to her son, who was concerned and accompanied her to the consult

with the psychiatrist. On mental status evaluation, patient consciousness was clear and civility was maintained. She had no episodes of impaired consciousness related to the hallucination. She scored 18 out of 24 on the Rivermead Behavioral Memory Test, and her clock drawing test was normal. No parkinsonian symptoms were observed. After the age of 55 years. Brain Magnetic Resonance Imaging (MRI) showed post-surgical changes secondary to her subarachnoid hemorrhage repair **(Figure 1).** No cerebrovascular lesions, edema, or hematomas were noted. The results of extensive laboratory tests, including renal and liver function tests; levels of electrolytes, vitamin B12, folate, and thyrotropin; and complete blood counts, were normal. Electroencephalography (EEG) revealed sharp waves of reproducible right temporal origin indicating right temporal lobe epilepsy **(Figure 2).**

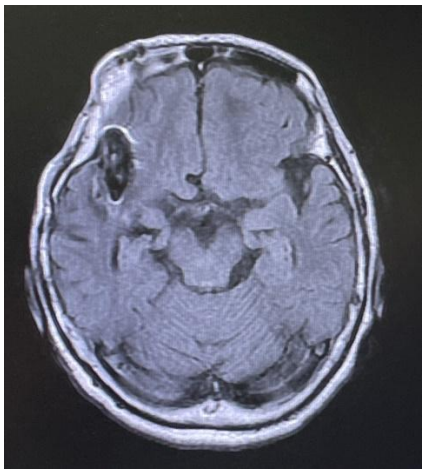

Figure 1: Brain magnetic resonance imaging. Post-surgical changes secondary to the subarachnoid hemorrhage repair are observed. No cerebrovascular lesions, edema, or hematomas are noted. Due to a clip, there are artifacts around the right Sylvian fissure.

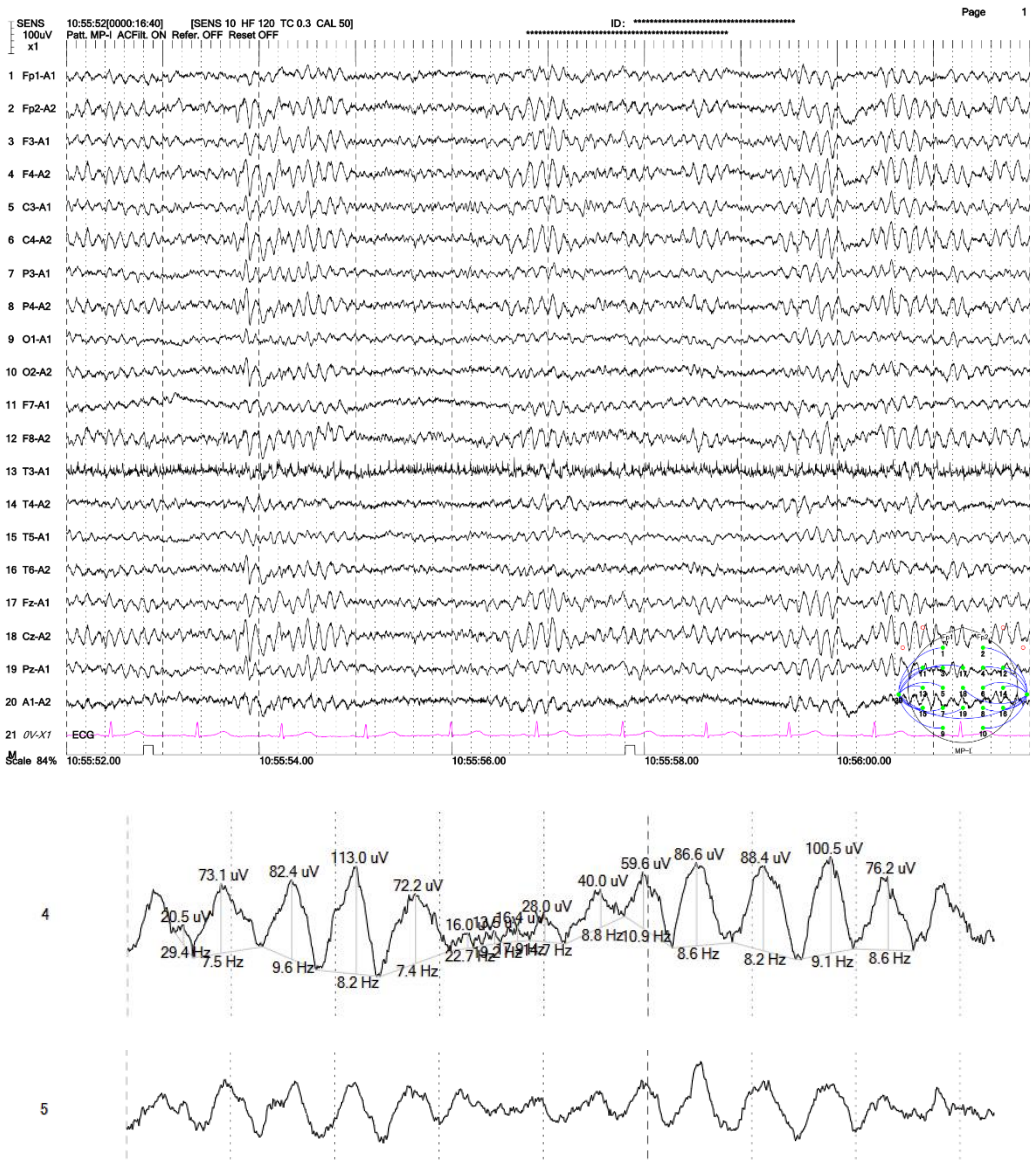

Figure 2: Electroencephalography. Sharp waves are detected with T4 and F8 as focal points. They appear repeatedly and are highly reproducible.

The symptoms of persistent persecutory delusions (auditory hallucination of a neighbor banging on the wall) and olfactory hallucinations suggest VLOSLP, organic mental disorders due to brain tumor or cerebrovascular disease **[8],** dementia, Parkinson's disease **[9],** or chronic sinusitis **[10].** Brain MRI findings ruled out organic mental disorders and chronic sinusitis. Dementia, including Lewy body

dementia, was ruled out because cognitive function tests were normal and visuospatial cognitive function was preserved. Parkinson's disease was also ruled out because of the absence of symptoms. The EEG showed reproducible sharp waves of right temporal origin rather than the typical abnormal EEG associated with schizophrenia; thus, this disorder was also ruled out. Although the patient lived alone and potential episodes of loss of consciousness or motor symptoms were unable to be independently verified, she was diagnosed with temporal lobe epilepsy based on her olfactory hallucinations and the EEG findings. The patient had poor insight into her olfactory hallucinations but consented to treatment for the EEG abnormality. The patient was prescribed 1000 mg per day of levetiracetam for temporal lobe epilepsy. After one month of treatment, the frequency of olfactory hallucinations decreased and she was no longer thirsty before going to sleep. The decrease in olfactory hallucinations with the start of levetiracetam medication allowed the patient to develop the insight that her hallucinations were related to epilepsy. Due to the side-effect of daytime drowsiness, the dose of levetiracetam was adjusted to between 500 and 1000 mg per day, but as the 500 mg daily dose allowed symptom relapse, the final dose was adjusted to 750 mg daily; following this, the patient's daytime sleepiness became less severe. She was followed up at our outpatient clinic for six months during which she did not have any persecutory delusions or olfactory hallucinations.

Discussion

This case of olfactory hallucinations was related to temporal lobe epilepsy. It could be that the patient developed systematic delusions of persecution because of her victimized view of olfactory hallucinations. The possible influence of psychiatric symptoms such as anxiety and depression after epileptic seizures [11,12] on the delusions cannot be excluded. The patient exhibited aspects typical of VLOSLP, accompanied by persecutory delusion complaints about her neighbor, such as "punching the wall," in addition to the phantosmia of a foul odor, and thus it was difficult to rule out this as the diagnosis. As for

the complaint of "the neighbor punching the wall," it is true that the apartment in which the patient resided was poorly soundproofed, and thus, it is possible that the wall-punching-like sound itself existed, even if it was not as loud as the patient felt it to be. In this case, the patient had been harassed by a neighbor in the past, which used to bang on the ceiling, and the olfactory hallucinations may have triggered the patient to interpret those noises in a negative way. In addition to olfactory hallucinations, the patient complained of thirst before sleep. Autonomic symptoms have been reported to occur during epileptic seizures, but reports of thirst specifically are scarce **[13].** Anxiety caused by olfactory hallucinations may have resulted in increased sympathetic nervous tone and associated thirst. In this case, the antiepileptic drugs improved the phantom smell, and the patient understood that the smell was a symptom of epilepsy, which may have led to a decrease in anxiety and an improvement in thirst. It should be noted that as the patient had a history of previous harassment by another neighbor, she may have had delusions of persecution toward her neighbors before she developed temporal lobe epilepsy. Even in that case, the olfactory hallucinations caused by temporal lobe epilepsy would have exacerbated her delusions of persecution; therefore, this does not undermine our argument that treatment for temporal lobe epilepsy led to an improvement in the persecutory delusions.

It is suggested that patients with olfactory hallucinations associated with temporal lobe epilepsy may lack insight into their disease and may develop delusions of persecution secondary to their disease. With the aging of society in recent years, it has been shown that an increasing number of patients are developing epilepsy for the first time at an older age **[14],** and late-onset epilepsy will become even more important in the differential diagnosis of olfactory hallucinations.

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