



Case Report

Delusions of control in a case of schizophrenia coexisting with a large cerebellar arachnoid cyst

Ying-Ying Wu^a, Yu-Chih Shen^{a,b*}

^aDepartment of Psychiatry, Buddhist Tzu Chi General Hospital, Hualien, Taiwan,

^bDepartment of Psychiatry, School of Medicine, Tzu Chi University, Hualien, Taiwan

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ABSTRACT

Arachnoid cyst is a benign, congenital space-occupying brain lesion, which has been found in patients with schizophrenia. The association between arachnoid cyst and schizophrenia remains controversial, but the location of the arachnoid cyst may give rise to a specific symptom presentation in schizophrenia. We present a 31-year-old woman with an established diagnosis of schizophrenia coexisting with a large cerebellar arachnoid cyst who presented mainly with delusions of control. This cerebellar arachnoid cyst and schizophrenia may have been found together coincidentally or brain dysfunction due to this cerebellar arachnoid cyst may have caused or contributed to the appearance of psychotic symptoms. The patient had an unsteady gait accompanied by delusions of control, and she showed a poor response to high-dose olanzapine treatment, suggesting the arachnoid cyst was associated with her schizophrenic symptoms. The cyst was over the right posterior fossa with cerebellum compression, which may have caused abnormality in the cerebellar-parietal network resulting in her delusions of control. This case indicates that there might be relationships between cerebellar lesions, schizophrenia, and delusions of control.

KEYWORDS: *Arachnoid cyst, Delusions of control, Schizophrenia*

INTRODUCTION

Arachnoid cysts are intra-arachnoid space-occupying brain lesions, typically of a benign, congenital nature. Such cysts are quite rare, accounting for only 1% of all lesions in the intracranial space and in most cases are accidentally diagnosed through neuroimaging [1]. Although arachnoid cysts are considered incidental lesions in patients with schizophrenia, the location of the lesion may influence the specific pattern of the illness [1]. We report a case of schizophrenia coexisting with a large cerebellar arachnoid cyst in a patient who presented mainly with delusions of control. The possible relationships between the cerebellar lesion, schizophrenia, and delusions of control are discussed.

CASE REPORT

A 31-year-old single woman was brought to the emergency department by the police because of psychotic behavior and delirium. She had a history of schizophrenia for 7 years and had been followed in different outpatient clinics with irregular use of various psychotropic medications. Her unusual behavior started roughly 1 week before this admission. She was confused and disoriented as to place and time. She described some vague delusions of control of someone controlling her actions, and she walked unsteadily as if about to fall. She was admitted to the psychiatric ward to rule out any medical etiology for her psychiatric symptoms. Her blood count, serum chemistry, and illegal drug screen were within normal limits. Electroencephalography

showed no signs of seizure activity. Brain magnetic resonance imaging revealed an arachnoid cyst about 6.9 cm × 4.1 cm × 3.1 cm over the right posterior fossa with cerebellum compression [Figure 1]. Because of a lack of signs of neurological deficit, the neurological surgeons recommended against any neurosurgical intervention. After 3 days of hospitalization, she showed marked improvement in delirium but not in psychosis with her medication regimen (orally disintegrating [ODT] olanzapine 20 mg/day). She described that her parents were the incarnation of devils. They could control not only her actions but also her thoughts and feelings. Sometimes, she showed a fierce facial expression and said that devils were controlling her unusual actions during the interview. The devils were also planting thoughts in her brain, listening to her thoughts, and watching her no matter where she went or what she did. She displayed poor insight into her medical condition, symptoms, and need for treatment, and presented with poor medication compliance. During the initial 4-week treatment, she was administered ODT olanzapine up to 30 mg/day; however, her delusions of control persisted. Therefore, during the following 4 weeks, a liquid formulation of valproate 1000 mg plus ODT olanzapine 30 mg/day were administered. She also received

**Address for correspondence:*

Dr. Yu-Chih Shen,
Department of Psychiatry, Buddhist Tzu Chi General Hospital, 707, Section
3, Chung-Yang Road, Hualien, Taiwan.
E-mail: shengmp@gmail.com

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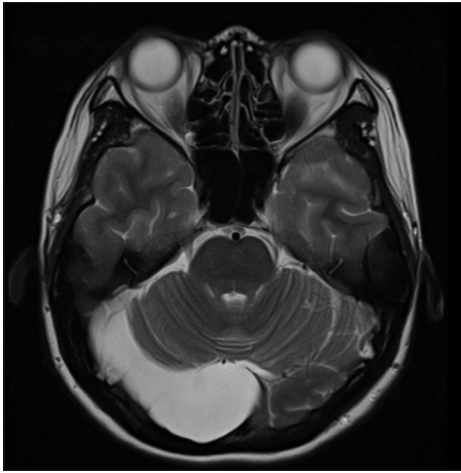


Figure 1: Cranial magnetic resonance imaging reveals an arachnoid cyst about 6.9 cm × 4.1 cm × 3.1 cm over the right posterior fossa with cerebellum compression

retribution psychotherapy for her delusions. After a 2-month hospitalization, the severity of her delusions had decreased but did not show remission. She was discharged with residual delusions and received a daycare rehabilitation program.

DISCUSSION

This patient's clinical presentation was characteristic of an acute psychotic episode accompanied by delirium. Following a thorough evaluation, medical causes for her presentation were ruled out except for a right posterior fossa arachnoid cyst. This cerebellar arachnoid cyst and schizophrenia may have been found together coincidentally or brain dysfunction due to this cerebellar arachnoid cyst may have caused or contributed to the appearance of psychotic symptoms and delirium.

In previous case reports [2-4], psychiatric symptoms have been associated with cerebellar arachnoid cyst, but the presentation of mental symptoms varied quite widely between cases, and included delusions of reference, persecution, and being controlled, auditory and visual hallucinations, inappropriate and labile affect, aggression, sleep disruption, and suicidal and homicidal thoughts. Neurological symptoms also varied widely, including balance problems, nausea, vomiting, headaches, and even seizures. The severities of the structural abnormalities in the previously mentioned cases varied, which might have partly contributed to the diversity of psychiatric and neurological symptoms. Despite the wide range of symptoms, these patients were commonly refractory to usual psychotropic treatment.

We speculated that the arachnoid cyst was associated with her schizophrenic symptoms for the following reasons: (i) she was unresponsive to regular-dose olanzapine (20–30 mg/day) and only partially responsive to a regimen of olanzapine 30 mg plus valproate 1000 mg/day. (ii) The cerebellum plays an important role in cognition and a variety of psychiatric disorders, including schizophrenia [5]. (iii) Neurological symptoms such as delirium and balance problems accompanied the psychotic symptoms. (iv) The arachnoid cyst was large enough to compress the right cerebellum and adjacent structures. Taken together, we hypothesized that her schizophrenic symptoms

showed a poor response to medication because of the relatively large size of the cerebellar lesion.

Although the association between the arachnoid cyst and her schizophrenia was unclear, the cyst may have given rise to her symptom presentation (delusions of control). In a positron emission tomography study [6], patients with delusions of control were scanned while they performed a simple motor task, in which they were required to move a joystick in 1 of 4 directions chosen at random. This willed action task was compared with a similar task, in which the joystick movements were paced. Patients with delusions of control showed overactivation of the cerebellar–parietal network relative to normal controls and to patients who did not have delusions of control. In our patient, the arachnoid cyst over the right posterior fossa with cerebellum compression may have caused abnormality in the cerebellar–parietal network resulting in her delusions of control.

Psychotic symptoms may occur in patients with abnormality in the cortico-cerebellar-thalamic-cortical circuit (CSTCC). It is thought that cerebellar feedback pathways through the thalamus to the cerebral cortex may play a role in psychotic symptoms [5]. Some postmortem and neuroimaging studies have demonstrated a significant negative correlation between cerebellar gray matter volume reduction and hallucinations [7,8]. Moreover, a significant correlation between delusions and activation of the cerebellum has been found [9]. In our patient, psychotic symptoms other than delusions of control may have resulted from CSTCC abnormality due to her large cerebellar arachnoid cyst.

This case indicates that there might be a relationship between cerebellar lesions and schizophrenia. This case report also suggests a relationship between cerebellar lesions and delusions of control. Further, neuroimaging studies are warranted to provide greater insight into the underlying neurobiological basis.

Declaration of patient consent

The authors certify that the patient has obtained appropriate patient consent form. In the form the patient has given her consent for her and other clinical information to be reported in the journal. The patient understands that her name and initial will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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