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Musical Hallucination in a Patient With Frontal Lobe Meningioma

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Introduction: Many conditions can mimic psychiatric symptoms. Amongst them, intracranial mass and space occupying lesions have a significant importance. Aggression and hallucination are seen in association with a basal frontal lesion, and may mimic psychotic syndromes.

Case Presentation: A 37-year-old man with no previous mental illness presented with a month history of headache, blurred vision, diplopia, aggression, loss of interest, fatigue, insomnia, and depressed mood. He was suffering from daily auditory hallucination which described as musical hallucination lasting about an hour per day. The headache was tension-type which appeared swinging, two times per week lasting 30 minutes. After auditory hallucination, the patient disclosed nausea, vomiting, and transient loss of consciousness. He referred from a neurologist, because, conventional therapy for the patient had not response. There were no other neurological symptoms or deficits. The results of neurologic examination including evaluation of the cranial nerves as well as head and neck examination were normal; But, psychiatric symptoms developed. Therefore, he was admitted to the psychiatric ward. The patient was diagnosed with major depressive disorder (MDD) with psychotic feature by Diagnostic and Statistical Manual of Mental Disorders (DSM) IV criteria and received psychiatric treatment. He started on antipsychotic agent (olanzapine 5 mg tablet/bid), antidepressant (sertraline 50 mg tablet/qhs) and valproate sodium 200 mg tablet/bid for treatment of aggression and headaches. After five days of admission, primary symptoms of headache and auditory hallucination were better but diplopia and blurred vision were still present. Ophthalmology examination revealed. The pupils were round, isochoric, and normoreactive to light and accommodation, and there was no sign of a relative afferent pupillary defect. Ophthalmoscopy showed a papilledema in both eyes. In order to rule out the intracranial pressure and their causes, neuroimaging was requested. An emergent noncontrast-enhanced computed tomography (CT) image of the head revealed a hyperdense mass in midfrontal convexity. Magnetic resonance imaging of the brain and orbits with and without intravenous gadolinium enhancement further delineated the CT findings and highlighted a large avidly enhancing midline mass within the frontal region measuring approximately 48×50×42 mm in axial dimension, consistent with a meningioma. The patient discharged from psychiatric ward with necessary advices and was admitted to the neurosurgery ward for further evaluation. A first psychosis episode is a clinical condition with principal indication for cerebral CT-scan.

Discussion: Meningioma is a common intracranial tumor with a variety of histomorphologic growth patterns, which are usually easily recognized. The three most common symptoms are headaches, mental status changes, and paresis. Aggression and hallucination are seen in association with a basal frontal lesion and may mimic psychotic syndromes like hypomania and schizophrenia. A first psychosis episode is a clinical condition with principal indication for cerebral CT-scan.

Keywords: Headache; Meningioma; Hallucination; Neurosurgery

1. Introduction

Many conditions can mimic psychiatric symptoms. Amongst them, intracranial mass and space occupying lesions have a significant importance. Aggression and hallucination are seen in association with a basal frontal lesion, and may mimic psychotic syndromes like hypomania and schizophrenia, particularly if the tumor encroaches on the third ventricle and adjacent structures (1, 2). Irreversible loss of myelin and axons in the frontal areas of brain surrounding the tumor may have contributed to the clinical picture of the syndrome (3). Herein we present a case of musical hallucination and headache in a young man with frontal lobe meningioma.

2. Case Presentation

A 37-year-old man with no previous mental illness presented with a history of headache, blurred vision, diplopia, aggression, loss of interest, fatigue, insomnia, and depressed mood for the preceding month. He was brought in by his family to the Emergency Department (ED) for psychiatric care. The patient denied any recent head trauma. He abused opium for 10 years and his last use was 48 hours ago. He denied any suicidal or homicidal ideation. He complained of once a day auditory hallucination that described as "musical hallucination" lasting about an hour. Although these hallucinations did not occur strictly with each attack, they were

frequent enough for him to seek medical consultation. He, however, did not experience hallucinations without headache episodes. He had frontal headaches of moderate severity. The attacks were tension type, swinging, occurring twice a week, and lasting 30 minutes. After auditory hallucination, the patient disclosed nausea, vomiting, and transient loss of consciousness. He had a family history of migraine headache in his mother but no psychiatric disease was documented in his family. The patient did not have a previous history of hallucinations or psychosis and had never been hospitalized for psychiatric problems. Initial vital signs were temperature of 36.9℃, pulse rate of 83 beats/minute, blood pressure of 105/70 mm Hg, and respiratory rate of 12 breaths/minute.

On physical examination, the patient was alert and oriented to person, place, and time. He referred from a neurologist because conventional therapy was not effective. There were no other neurological symptoms or deficits. Electroencephalographic (EEG) examination during a headache episode did not reveal any abnormality. Results of the laboratory studies were normal except a mild leukocytosis and a hemoglobin of 17.6 g/dL; urine toxicology results was positive for morphine. Neurologic examination, including evaluation of the cranial nerves as well as head and neck examination had no significant finding; however, psychiatric symptoms were present. Therefore, he was admitted to the psychiatry ward. The patient was diagnosis with major depressive disorder (MDD) with psychotic feature by Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV) criteria and received psychiatric treatment. Antipsychotic agent (5-mg olanzapine, bid), antidepressant (50-mg sertraline, qhs), and valproate sodium (200 mg, bid) for treatment of aggression and headaches were prescribed. After five days of admission, primary symptoms of headache and auditory hallucination improved but diplopia and blurred vision persisted. Ophthalmologic examination revealed round, isochoric, and normoactive to light and accommodation pupils without any sign of relative afferent pupillary defect. Ophthalmoscopy showed a papilledema in both eyes. In order to rule out the raised intracranial pressure (RICP) and its causes, neuroimaging was requested. An emergent noncontrast-enhanced computerized tomography (CT) image of the head revealed a hyperdense mass in the midfrontal convexity (Figure 1).

Magnetic resonance imaging (MRI) of the brain and orbits with and without intravenous gadolinium-enhancement further delineated the CT findings and highlighted a large, avidly enhancing midline mass within the frontal region measuring approximately 48 × 50 × 42 mm in axial dimension, and features consistent with a meningioma (Figure 2).

The patient was discharged from the psychiatric ward with necessary recommendations and was admitted to the neurosurgery ward for further evaluation.

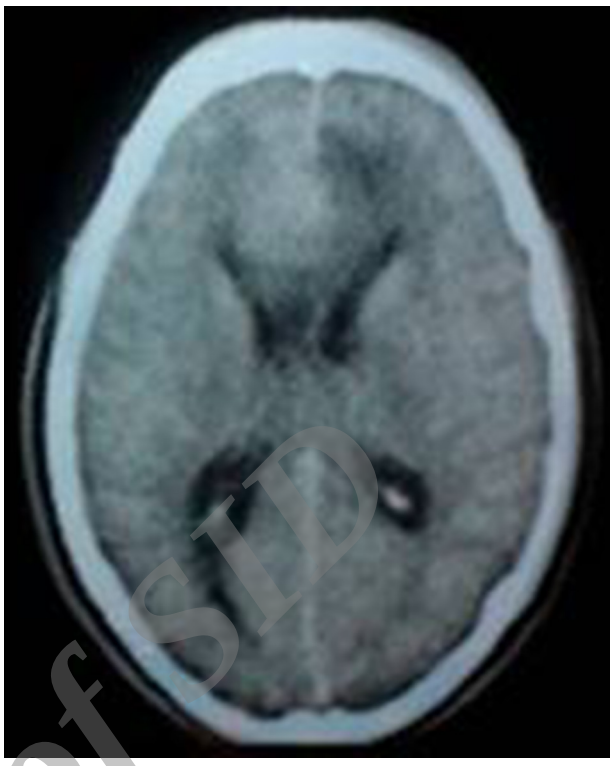

Figure 1. Noncontrast-Enhanced Cerebral Computed Tomography Showed a Giant Expansive Tumor in the Frontal Lobe With Middle Compression on the Right Ventricular Horn

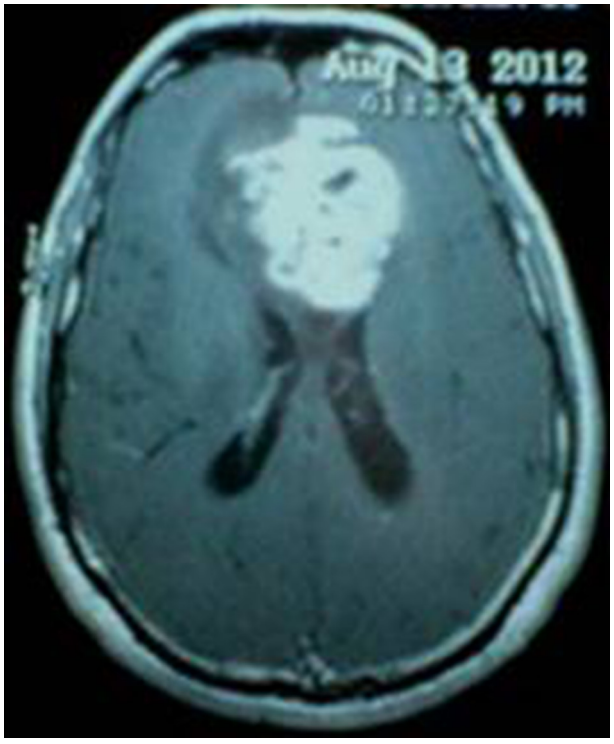

Figure 2. Axial FLAIR Magnetic Resonance Imaging of the Brain Illustrating a Large Heterogeneously Hyperintense, Extra-Axial Mass, 48 × 50 × 42 mm, Located in the Frontobasal Region With Appearance of Meningioma

3. Discussion

Meningiomas are extra-axial and benign tumors arising from arachnoid cap cells and may develop anywhere that arachnoid cells are found, ie, between brain and skull, within ventricles, and along spinal cord. These lesions can develop at any age but are commonly seen at middle age (4). Meningioma is a common intracranial tumor with a variety of histomorphologic growth patterns, which are usually easily recognized (5). Meningiomas constitute about 20% to 30% of all primitive brain tumors (6). Most meningiomas are benign, ie, classic or grade I, well circumscribed, slow growing, and depending on their location, curable by surgery (7). The clinical symptoms usually depend on the involved anatomic site, but many of them are found incidentally. The three most common symptoms are headaches, mental status changes, and paresis (8). Aggression and hallucination are seen in association with a basal frontal lesion and may mimic psychotic syndromes like hypomania and schizophrenia, particularly if the tumor encroaches on the third ventricle and adjacent structures (1, 2). Patients with a tumor in frontal convexity may appear apathetic and indifferent with psychomotor retardation; a picture that may be confused with MDD. Irreversible loss of myelin and axons in the frontal areas surrounding the tumor may contribute to the clinical picture of the syndrome shown by these patients (3). Visual dysfunction is usually one of the early as well as one of the most common manifestations of suprasellar meningiomas (9-11). Classically, these lesions cause visual field deficits due to downward compression on the optic chiasm (12).

Papilledema is swelling of the optic nerve head secondary to RICP. It is almost always bilateral, although it may be asymmetrical (13). All patients with papilledema should be suspected of having an intracranial mass unless proved otherwise; however, not all patients with RICP will necessarily develop papilledema. In comparison with tumors of the posterior fossa, tumors of the cerebral hemispheres tend to induce papilledema later (14). In tumors lying adjacent to the optic apparatus, visual loss can occur without any significant growth of the meningioma on radiographic images. Early diagnosis is important to optimizing long-term visual outcome in these patients (15). The presence of tumor explains the resistance at therapy. CT scanning is usually the initial imaging study; however, MRI with gadolinium enhancement is considered the gold standard.

Most meningiomas are slow growing and cause signs and symptoms by compression of nearby structures. Many meningiomas are found incidentally. According to several large retrospective case reviews of olfactory groove meningioma, the most common presenting symptom is headache. This presenting symptom of headaches is more commonly associated with large and giant tumors (16). In our case, depression and auditory hallucination were the principal manifestations of meningioma.

Lishman cited a frequency of 0.5% for undiagnosed primary or metastatic brain tumors among those admitted to a psychiatric unit (17). Remington and Rubert reviewed the presenting clinical condition among 30 brain tumor patients admitted to a state mental hospital; they found that the three most common sign or symptoms upon admission were depression, memory deficit, and combativeness (18). Primary intracranial tumors do not produce specific findings. Many meningiomas were founded incidentally; therefore, observation may be reasonable for many patient.

The overall prognosis of meningiomas is good and, as expected, somewhat dependent on tumor histopathology. Advances in radiological imaging techniques such as CT and MRI have improved the surgeon's ability to predict the success for complete resection of the mass. In the presented case, the headache was the patients' main complaint; however, the cohort of symptoms as persistent headache and psychosis, should have alerted the physicians to investigate the possible organic etiology.

In this regard, it is mandatory and contemporary to ascertain drug or medication abuse, general medical condition such as hypothyroidism or hyponatremia, and neurological history including head trauma; furthermore, thorough neurological examination should be always performed in patients with psychiatric disorders, especially when the syndrome persist for a long time and appears nonresponsive to the specific treatment. If clinical features as well as history are suspected for organic brain disease, MRI would be warranted to detect brain involvement and to promptly allow the appropriate therapeutic strategy. In our patient, the final diagnosis was made after the visual impairment occurred, the clinical examination was performed, and MRI was done. The patient's symptoms had an unusual feature of auditory hallucination manifesting in close association with each attack. In the absence of thought disorder, this clinical description makes the diagnosis of psychotic disorder most unlikely. The importance of this case report is providing an illustration of auditory hallucination and visual impairment that can occur with insidious tumors such as meningioma. These slow-growing, giant tumors can occupy the entire anterior skull base while causing minimal symptoms, such as personality changes and affective symptoms; however, the most significant presenting symptom can be vision loss.

Emergency physicians should consider psychotic and affective symptoms in patients presenting for psychiatric conditions with changes in vision. Given this patient's initial presentation, an appropriate workup would include psychiatric and ophthalmologic consultation and a head CT scan, with and without contrast; however, once diagnosed, the physician should request a neurosurgery consultation and an MRI study.

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Author's Contributions

Amir Keshavarzi developed the original idea and wrote the manuscript. Mohammad Haghighi revised the manuscript. Ali Ghaleiha treated the patient. The patient was followed up by Leila Jahangard.

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