

Psychotic manifestations as an initial presentation in glioma: two case reports and review of literature

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Abstract

Psychotic manifestation as an initial presentation of brain tumor is a rare manifestation of the primary disease. A 32-year-old male patient presented with auditory and visual hallucinations, delusion of persecution and profound agitation. The patient was initially suspected as a case of acute psychosis; however, on imaging work-up, a large central space-occupying lesion (SOL) in the brain was detected. Following surgical removal of the brain tumor, psychotic manifestations disappeared. The pathology revealed astrocytoma grade III. Similar presentation was observed in a 28-year-old woman who first visited the psychiatry department. Imaging revealed an SOL in the right parietal lobe. She underwent craniotomy and gross total resection of the tumor. The histopathology of the surgical specimen revealed astrocytoma grade II. Neuropsychiatric manifestations may have a large impact on the quality of life of patients with primary brain tumors and should therefore be adequately managed.

Key words: brain tumor, glioma, psychosis, hallucination.

Introduction

Psychotic manifestations are usually not seen as an initial presentation in primary brain tumor patients. Common initial presentations include headache, vertigo, projectile vomiting, focal neurological deficits, and seizures. However, anxiety, depression, mania, psychosis, cognitive or personality changes may develop during the course of the disease as psychotic manifestations. Patients presenting with psychosis not responding to antipsychotic treatment or having focal neurological deficits and papilledema should be examined thoroughly to rule out a space-occupying lesion in the brain. The main objective of this report is to describe psychosis as an initial presentation in patients with a primary brain tumor, in order to make clinicians aware that further examination of these patients is warranted.

Case report 1

A 32-year-old man was referred by a general practitioner to the psychiatry department of our hospital with three months history of auditory and visual hallucinations, delusion of

persecution, and loss of both recent and remote memories. Also, the patient was irritable without clouding of consciousness. He complained of headache and vertigo occasionally. The patient did not have any prior or family history of psychosis or any narcotic or drug abuse, or any other medical complaints. He had received antipsychotic drugs for the last three days with no response. To rule out any organic cause, magnetic resonance imaging (MRI) of the brain (Fig. 1) was done, which showed moderate hydrocephalus related to foramen of Monro obstruction with mild transependymal cerebrospinal fluid seepage. Edema was also seen in the deep right frontal lobe along the ventricular margin. There was compression of the adjacent brain parenchyma. These MRI findings were compatible with centrally located glioma attached to the septum pellucidum within the right lateral ventricle, showing extension across the midline with a temporal component in the body of the left lateral ventricle. He had bilateral papilledema without focal neurological deficits. On examination, the patient was disoriented to time and place, had poor attention and comprehension

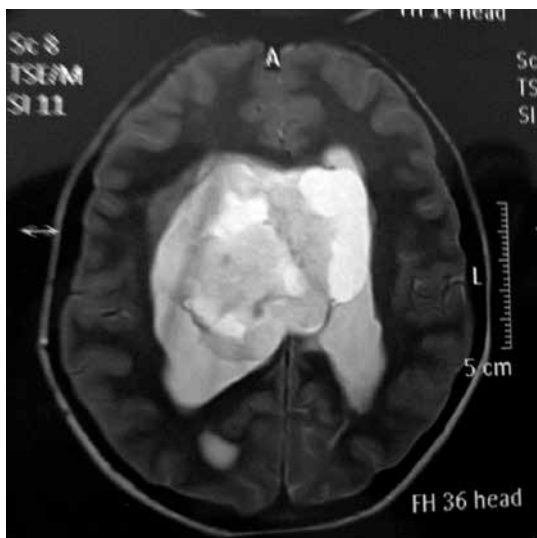


Fig. 1. Magnetic resonance imaging of brain showing central mass lesion attached to septum pellucidum



Fig. 2. Magnetic resonance imaging of brain showing space-occupying lesion in right parietal area

along with recent and remote memory loss. He underwent craniotomy and gross total resection of the tumor. The histopathology of the surgical specimen revealed astrocytoma grade III. There was resolution of all his psychotic symptoms within a week after the operation.

Case report 2

A 28-year-old woman visited the psychiatry department for complaints of headache and vertigo for the last seven months. For the last ten days, she had complained of auditory hallucinations of whispering in her ears. In the last three days, she had developed violent outbursts with visual hallucinations and seizures. She was given benzodiazepine with phenytoin. The patient's symptoms were poorly controlled with this treatment. Magnetic resonance imaging of the brain (Fig. 2) was suggested to rule out an organic brain lesion. It revealed a large space-occupying lesion in the right parietal region; findings were compatible with glioma. She underwent craniotomy and gross total resection of the tumor. The histopathology of the surgical specimen revealed astrocytoma grade II. After removal of the tumor, all symptoms subsided within a week.

Discussion

Brain tumors are commonly associated with neurological deficits but psychiatric manifestations may be rarely seen as an initial manifestation. Brain tumor patients in particular (often but not always) face progressive compromise of peripheral neurological function, subtle and

overt cognitive function and widely variable change of mood and affect (Price *et al.* 2002). The causes underlying most patients with psychiatric features include manic depressive psychosis, schizophrenia and substance or drug abuse of various types. The degree to which organic causes are responsible for psychiatric manifestations is difficult to determine. Accurate diagnosis in these cases can be a diagnostic challenge. According to Williams's retrospective study of 107 patients, patients with organic brain disease in psychiatric hospitals pose special difficulties in diagnosis. The recognition of organic brain disease which may be amenable to neurosurgical treatment is particularly important and in this series 'neurosurgical illness' is defined as that illness which would reasonably come under the care of a neurosurgeon at some stage (Williams *et al.* 1974). The possible psychiatric manifestations of brain tumors are associated with the location of the tumor in the brain. Filley *et al.* (1995) reported that tumors in the frontal lobe can present with abulia, depression or personality changes while tumors of temporolimbic areas can present with panic attacks, mania, memory loss or auditory and visual hallucinations. Features of schizophrenia may be ascribed to malfunction of the left hemisphere and affective disorders to the right hemisphere. In tumors of intraventricular areas, the occipital lobe, and corpus callosum, only transitory symptoms are produced with no specific signs, and tumors can grow considerably (Uribe *et al.* 1986). Ouma *et al.* (2004) described two cases of patients diagnosed with psychosis who were found to have intraventricular tumors (central neurocytomas). In some cases, symptoms

can respond to antipsychotic treatments, further complicating the diagnosis. Detailed history, brain imaging and information from collateral sources become essential when brain tumors develop in patients with established psychiatric disorders as psychiatric patients are known to have difficulties in reporting and describing their own symptoms (Madhusoodanan *et al.* 2004).

Cognitive decline occurring during the course of brain tumor treatment was reported by Taphoorn *et al.* (1994). Surgical excision can yield a good result only if the tumor size is small. Carson *et al.* (1997) reported a case of a 9-year-old boy on MRI having a tumor in the anterior third ventricle and associated hydrocephalus and papilledema who presented with psychosis as the initial presentation. The patient remained free of symptoms after resection of the tumor at one year of follow-up. The psychotic manifestations may be related to the location of the tumor. Posterior fossa tumors can disrupt the cerebellar output to mesodopaminergic areas, locus coeruleus and raphe nuclei, leading to behavioral and psychiatric changes. Another possible mechanism may be deafferentation of the thalamolimbic circuits by cerebellar lesions. Sato *et al.* (1993) reported a case of a 55-year-old woman with a 6-year history of uncontrolled complex partial seizures and severe delusions who improved dramatically after removal of a right frontal lobe mixed oligoastrocytoma or dysembryoplastic neuroepithelial tumor. Moise *et al.* (2006) described a case of a 29-year-old woman who was treated for > 4 years for posttraumatic stress disorder and borderline personality traits, who developed depressive symptoms and memory difficulties. However, she did not develop any major neurological signs or symptoms. Brain imaging showed the presence of a left thalamic tumor, later confirmed as glioblastoma multiforme. The anatomic sites which control human behavior and emotions are believed to be the circuits of the limbic system which interact with the basal ganglia and disturbances in these systems are primarily responsible for manifestations of psychiatric symptoms (Feldman *et al.* 2001). In patients hospitalized for psychotic affective disorder, abnormalities have been found in the left subgenual cingulate gyrus. Schizophrenic disorder was observed in patients suffering from agenesis of the septum pellucidum. Hippocampal volume reduction has been reported in schizophrenia as well as volume reduction in the parahippocampal and fusiform gyri on the left side in another study on schizophrenics. A study by Gupta *et al.*

(2004) identified 79 patients having a primary diagnosis of benign brain tumor. There were 56 female patients and 23 male patients. Seventy-two of these had meningiomas. Fifteen (21%) of 72 meningiomas cases, 8 men and 7 women, presented with psychiatric symptoms in the absence of neurological symptoms. Affective disorders were a common presentation. The majority of cases showing psychosis (and other mental problems) related to brain tumors concern meningiomas, while both our cases are malignant gliomas.

Patients who present with psychotic symptoms but do not respond promptly to anti-psychotic treatment should undergo imaging work-up to rule out a primary space-occupying lesions of the brain. Thus, to conclude, physicians should be aware that psychosis can be an initial presentation of brain tumors and further examination of these patients is warranted for correct and timely diagnosis.

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