

## Frontal meningioma presenting as depressive episode: case report and a brief review of literature

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### Abstract

Brain tumours have been notorious for impersonating as psychiatric disorders. In some cases, patients may only have psychiatric symptoms, such as mood changes (depression or mania), psychotic symptoms, panic attacks, changes in personality, or memory difficulties. The frontal lobes tumours of the brain are notoriously "silent and present only with atypical psychiatric symptoms. These may be detected in patients at their first presentation to mental health services or sometimes in patients with well-established psychiatric diagnoses. Thus, they often pose a diagnostic problem and may cause delay in actual treatment. We present a case of 27 years old female presenting with depressive symptoms and diagnosed to have frontal lobe Meningioma four years after the onset of symptoms. Our case illustrates the need for prompt and detailed assessment including brain-imaging studies when patient presents with atypical psychiatric symptoms to decrease the suffering of patient and family.

### Introduction

Tumours of brain can cause myriad of symptoms, either common to all tumours or specifically related to the location of the tumour<sup>(1)</sup> Brain tumours can present with psychiatric symptoms and without any localising sign often the association between psychiatric symptoms and tumour location or histological type is difficult to establish. Thus, it becomes important for a clinician to suspect intracranial growth in patients with new-onset psychiatric symptoms, atypical presentations or treatment resistance. An early diagnosis of brain tumour helps in treatment and amelioration of symptoms which are often not responding to conventional treatment. Psychiatric symptoms may be the only initial manifestations of silent growing tumours like meningiomas or gliomas in a significant number of cases occurring in the fifth decade of life. The frontal lobe tumours of the brain are often called as "silent tumours".<sup>(2)</sup>

Brain tumours can be primary that is they arise from the brain and associated tissue itself and secondary arising from site other than brain and metastasising to brain. Psychiatric manifestation is common to a variety of brain tumours specially tumours of frontal lobe. Patients with slow growing tumours, such as meningiomas or gliomas are more likely to cause early mental changes<sup>(3,4)</sup> In many of such tumours, localizing signs can appear quite late and only during final stages. For these reasons frontal meningiomas poses a diagnostic problem and more often found to delay the actual treatment.<sup>(5)</sup> Meningiomas can present as depressive disorder or depressive symptoms which are refractory and eludes the physician. One study reported depression in about 2.5%-15.4% of cases of primary brain tumours<sup>(6)</sup> also reported in a further study presence of depression in

44% of all brain tumour patients.<sup>(7)</sup> Also frontal lobe tumours present most commonly with depressive symptoms.<sup>(7,8,9)</sup> We present a case of a young female presented with depressive and dissociative symptoms, diagnosed to have frontal meningioma four years after the onset of symptoms.

### Case Report

A 27 years old postgraduate, unmarried female presented to emergency department of a medical college in Southern India with complains of acute onset of numbness in right hand and leg along with headache. She was evaluated in detail and the history was gathered from the family members. On enquiry it was revealed that the patient had been symptomatic for last four years. The symptoms started around four years back while she was pursuing her graduation. The patient initially reported symptoms of decreased energy levels, easy fatigability anxiety, and lack of concentration, headache and dizziness. However, these symptoms were mild in intensity and were not bothersome. Also, the symptoms were not pervasive but showed fluctuations over days and months. The patient was able to carry out her daily activities and day to day functioning despite these symptoms. The patient was also diagnosed with anaemia which was found to be iron deficiency anaemia for she was treated by a general physician with oral iron and multivitamin supplements. However, despite treatment the symptoms of fatigue and lethargy persisted and were reason for frequent referrals to multiple health care facilities. On most of the occasions, she was treated conservatively with multivitamins, antioxidants, iron supplementations and herbal remedies.

The patient was engaged but the marriage was called off due to some reasons and the family also faced

severe financial loss. The symptoms worsened and she started exhibiting depressed mood which was pervasive, lethargy and easy fatigability. Her interaction with family members and friends decreased significantly and started to remain confined to self on most occasions. The patient also showed crying spells and had disturbed sleep and appetite. The family consulted a local psychiatrist and she was diagnosed to be suffering from a Major Depressive Episode. She was started on treatment and began to receive antidepressants for a month however her symptoms did not improve much with medications and her symptoms of extreme fatigue and lethargy worsened significantly thus leading to inability in carrying out the household activities. She was investigated and the investigations included Hemogram, Liver Function Tests, Kidney Function Tests and Thyroid Function Test. All the investigations carried out were within normal limits, however, she presented with acute onset symptoms of numbness of right hand and leg which was associated with pain and weakness of the same side along with bifrontal headache. These symptoms started abruptly after a family squabble when financial issues were discussed in a family meeting. The symptoms persisted for around 30 minutes where she was unable to walk but resolved spontaneously. There was no associated loss of consciousness, seizures and deviation of face. In emergency she was examined clinically and no neurological deficit was found. Mental State Examination done revealed a young adult female in her twenties who was adequately kempt but appeared reserved. The affect was depressed and the rate of speech was decreased, however spontaneous. Thought contents revealed depressive cognitions in the form of ideas of hopelessness. However, no death wishes or suicidal ideations were noted. Based upon the history and the findings on MSE, a diagnosis of Double depression With Dissociative disorder, mixed type was made and she was referred to Psychiatry Department. Patient was admitted the next day.

On the basis of past episodes of unconsciousness and current reversible neurological complaints, a detailed neurological workup including neuropsychology was done. Fundus examination showed bilateral papilledema. There was slight reduction in power in right upper and lower limb (4/5) as compared to left (5/5). Mild deviation of angle of mouth was suspected. She showed frontal lobe signs like the presence of frontal release reflexes, deficits in attention, abstract ability and fluency tests along with motor impersistence (soft neurological sign). A contrast enhanced computed tomography of head revealed a large (6.4×4.7×7.7cm) homogenous extra axial, left parasagittal hyper dense mass in left frontal region. The mass was broad based arising from the left side of falx cerebri and was associated with right sided midline shift of about 1.5 cm and with mass effect on the right brain parenchyma. A possibility of right frontal

Meningioma was made. Patient was referred to neurosurgeon after counselling the family about her diagnosis and the need of surgical treatment. Her symptoms over the years could be explained on the basis of this slow growing tumour. She underwent left frontoparietal craniotomy and total excision of large parasagittal falx Meningioma under general anaesthesia. Histopathological examination revealed meningothelial Meningioma.

The patient showed a significant improvement after the resection of the tumour. Her symptoms of lassitude, lethargy and fatigability showed remission. Her mood symptoms also improved and after few weeks of the surgery she was euthymic. The depressive cognitions also remitted and her day to day functioning was restored. She was now able to carry out the daily chores and resumed her work. After about six months of surgery she was married and continued to show remission of symptoms till one year of the surgical procedure. The presenting symptoms did not recur till last follow up which was after one year of surgery.

## Discussion

Tumours of the central nervous system represent around 10% of all neoplasm.<sup>(10)</sup> Most common primary brain tumours are the gliomas and the meningiomas, whereas metastases from breast and lung cancer are most likely secondary causes of tumours of the brain.<sup>(11)</sup> Brain tumours often present with psychiatric symptoms, and patients with any type of brain tumour can present with any psychiatric symptoms. Studies have shown that around 70% of patients with brain tumours have psychiatric symptoms and around 20% of patients having brain tumours presents initially with psychiatric rather than neurological symptoms.<sup>(12)</sup> The psychiatric manifestations commonly seen are depression, mania, psychosis, anxiety, apathy, cognitive or personality changes etc.<sup>(13)</sup>

Different factors affect the clinical presentation of the patient with a brain tumour i.e. the rate of growth of the tumour, tumours producing raised intracranial tension, location of the tumour, tumour type and premonitory intelligence.<sup>(11)</sup> It has been seen that slow-growing tumours (like meningiomas) produces adaptive changes in the brain and it is more likely to be neurologically silent, thus presenting with only with psychiatric symptoms without general or localising neurological signs and symptoms. Whereas fast-growing tumours are more likely to cause psychotic symptoms and behavioural symptoms slow-growing tumours are more likely to cause personality changes, apathy, depression and cognitive disturbances.<sup>(14)</sup> In a study done by Gupta and Kumar (2004),<sup>(12)</sup> 21% of Meningioma cases presented with psychiatric symptoms in the absence of neurological symptoms. The most common type was affective disorders and no correlation was found between brain laterality and the psychiatric co morbidity. In another study done by

Lamp and Barak (1995), psychiatric disorders were diagnosed in 44% in meningioma<sup>(15)</sup> with convexity. They found that psychiatric co-morbidity in the right hemisphere group was found only in patients with frontal lobe meningioma. They also obtained a statistically significant correlation between oedema volume and the presence of coexisting psychiatric disorders, but not between the tumour's mass volume and the psychiatric symptoms. Velakoulis et. al.<sup>(16)</sup> described a case of frontal meningioma which mimicked relapse of schizophrenia. There are reports of delay in diagnosing brain tumours which present predominantly with psychiatric symptoms. A silent meningioma that remained undiagnosed for 42 years has been reported<sup>(1)</sup> and in one series of parasagittal meningiomas 8% of patients had histories of more than 10 years, the longest being 37 years.

Meningioma that compresses the frontal lobes may not produce any symptoms other than a gradual decline in personality and intellect until they are large. Patients with such tumours are often referred first to psychiatrists, and the correct diagnosis may emerge only when the tumour has grown large and has begun to displace the brain.<sup>(17)</sup> Brain tumours, either primary or metastatic, typically cause development of focal neurologic deficits such as hemiparesis, sensory deficit and aphasia. However, given the large-scale dynamics of cerebral neural networks other unpredictable functional consequences might appear.<sup>(18)</sup> The delay is mostly seen with frontal lobe tumours which presents with personality change, depression, aggressive behaviour and dysexecutive symptoms.<sup>(18)</sup> Frontal lobe dysfunction exhibits laterality: left hemisphere lesions are more typically associated with depression, whereas right hemisphere lesions are associated with impulsivity and manic like. Human frontal lobe lesions can result in alterations in attention, insight, mood, planning, and interpersonal communication—Frontal lobe lesions exhibit lateralization with respect to psychiatric or behavioural disturbances. Left hemisphere lesions are more likely to be associated with depression, particularly if the lesion involves the dorsolateral portion of prefrontal cortex changes that are often permanent.

Neuroimaging like CT or MRI scanning should be considered in patients with new occurrence of neurobehavioral symptoms or signs accompanied by signs suggestive of raised intracranial tension viz. headache, nausea, vomiting, papilledema, seizures and focal deficits for early diagnosis and treatment.<sup>(5)</sup> Prefrontal structures are believed to have a potential role in mood regulation. Frontal lobe masses including tumours can mood disorders by changing the adjacent neural aggregates. Brain tumours may present multiple psychiatric symptoms such as mood alteration, anxiety, delirious state or amnesia. Furthermore, this case under warranted. In addition, some patients with long-term neurologically silent brain tumours may present with

psychiatric symptoms only. These subgroups of people are prone to misdiagnosis and, based on their no responsiveness to conventional antidepressant treatment, are at risk for the life-threatening consequences of suicidal ideation. Therefore, we emphasize the consideration of neuroimaging in patients with new onset psychiatric conditions even in the absence of neurological symptoms lines that a careful search for the organic causes of psychiatric conditions is always warranted. Brain tumours may or may not be associated with neurological symptoms. The tumours can be primary or secondary. Patients can present with depression, mania, psychosis, anxiety, apathy/abulia, cognitive or personality changes, and even anorexia nervosa.

Our case illustrates the need for prompt and detailed assessment including brain imaging studies when patient presents with atypical psychiatric symptoms. Our patient was treated for four years by different consultants before brain tumour was diagnosed. One author had concluded that left frontal tumours are more frequently associated with depression and akinesia.<sup>(19)</sup> This case also had tumour on left side. However it could not be concluded in our case whether her psychiatric symptoms were caused by the brain tumour or she developed the tumour at a later stage. As discussed earlier that slow growing frontal meningiomas can present with psychiatric symptoms only and neurological hard signs come later, this might have caused a delay in our case. An early investigation with magnetic resonance imaging or a contrast enhanced CT scan may have detected the mass much earlier, causing less suffering to patient and the family. A thorough neurological evaluation is important to assist the diagnosis in a case with atypical presentation, poor response to treatment, waxing and waning of symptoms. This case also highlights that tumours cannot always be localized definitively by their psychiatric presentation. It is important for clinicians to have an index of suspicion of brain tumour in patients with new-onset psychiatric symptoms, atypical presentations and treatment resistance. Psychiatric symptoms may be the only clue to the presence of a brain tumour. It is important to conduct a detailed physical, neurologic and psychiatric examination. Affective and schizophrenia like psychosis related to dysfunctions of the right and left hemispheres, respectively and lesions of the temporal lobes commonly cause depression. Patients with psychiatric symptoms secondary to brain tumours may respond to treatment with psychotropic medications.

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