SUMMARY

Temporal glioblastoma presenting as catatonia

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The objective of this article is to describe the possible association of catatonia and temporal brain lesions. This is a case presentation of a 57-year-old man presenting with depression, with catatonia secondary to a temporal glioblastoma. He was referred to hospital because for a sudden deterioration in depressed state. He was diagnosed with catatonia and treated successfully with lorazepam. During his admission, he became increasingly disinhibited, and an MRI scan revealed an intracranial mass in the right temporal lobe, with uncal herniation and a mass effect. Surgical resection of the entire tumour was successful. Histological examination revealed a glioblastoma multiforme requiring additional chemoradiotherapy. Postoperatively, catatonic signs and symptoms were not detectable. A postsurgical frontal syndrome with disinhibition and logorrhoea was present and gradually normalised over the course of several weeks. Catatonia can be the presenting symptom of a temporal brain tumour, and should therefore prompt the physician to a thorough medical investigation.

BACKGROUND

Brain tumours are encountered only rarely in a psychiatric hospital setting. However, psychiatric symptoms can be the first signs of a malignant cancer. Several causal mechanisms may be involved. The symptoms can be caused by direct pressure of brain tumour or metastases, immunological reactions, ectopic hormone production or hypoperfusion. The incidence of cancer and other somatic illness is higher in older age groups, especially in people older than 50 years,¹ and should therefore be considered in the evaluation of patients with new-onset psychiatric symptoms. The early detection of malignancy is of utmost importance, since it gives a chance of providing a curative intervention.

Brain tumours can present with a variety of psychiatric symptoms, of which depression seems to be the most common.² There are few descriptions of brain tumours presenting with catatonia.^{3–6}

We report a case of a 57-year-old man presenting to the emergency room with catatonia.

We show that catatonia is a motor syndrome that accompanies various psychiatric and medical conditions, including brain tumours. Irrespective of the underlying cause of the catatonia, the principles in catatonia treatment stay the same. Nevertheless, it is vitally important to also treat the underlying cause.

Catatonia is a severe and possibly lethal syndrome with an excellent prognosis if recognised and treated appropriately without delay. Despite its frequent occurrence, it is often missed during diagnosis. The emergence of a catatonic syndrome, most frequently in the presence of a psychiatric condition, should prompt the clinician to rule out other medical conditions.

CASE PRESENTATION

The patient was a 57-year-old man. He was brought to the emergency room because of sudden deterioration of a depressive episode. He had no prior psychiatric history. He had lost approximately 4 kg in the past month. His self-care had become poor, and he had developed nocturnal urinary incontinence. Interaction with the patient was becoming increasingly difficult.

On admission, the man was found in a state of self-neglect sitting slumped in a wheelchair. He made limited eye contact and had a staring gaze with a flattened facial expression. The patient's responses to questions were delayed, with fragments and half-phrases. Echolalia was present. He spoke of 'silly thoughts'. There were verbal stereotypies ("it will never get better", "I won't get out of this"). There was increased motor activity, with repetitive motor behaviour including reciprocation of the lower jaw, finger strumming and foot tapping. He had an unstable walk, with increased tendency to fall (the night before admission he fell three times). On physical examination, rigidity and catalepsy were observed.

A diagnosis of a depressive episode, with catatonia, was made, and the patient was admitted to a psychiatric ward. Catatonic signs were evident: multiple echophenomena, verbal stereotypies and immobility. He also displayed discrete apraxia and urinary incontinence.

Treatment with lorazepam 1 mg, four times per day, resulted in a gradual improvement in the clinical picture. The patient expressed feelings of sorrow, loneliness and a fear of dying. Within days, his behaviour became more disinhibited, with sexual acts, sudden aggressive outbursts and endless discussions about rules and regulations on the ward. In addition, the patient had double vision.

INVESTIGATIONS

An extensive blood test (including virology, anti-Nmethyl-D-aspartate receptor antibody and sexually transmitted diseases screening) revealed no abnormalities. In the clinical neurological examination, the patient gave a functional impression with negativism, closed eyes and a persistent athetoid movement of the right arm after testing rigidity. The electroencephalogram showed a regular rhythm which excluded a non-convulsive seizure; however,

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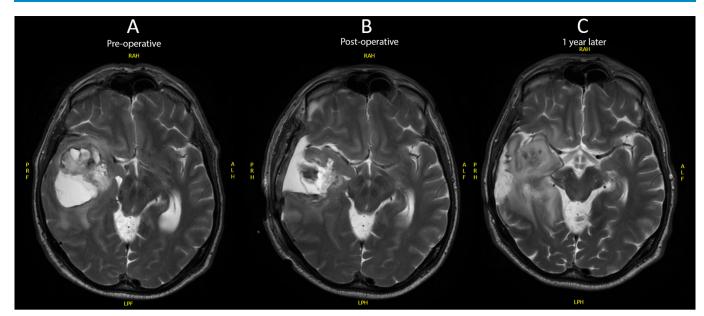


Figure 1 (A) T2-weighted MRI scan reveals an intracranial mass, in the right temporal lobe, with uncal herniation and mass effect. (B) T2-weighted MRI scan, after resection of the tumour. (C) T2-weighted MRI scan 1 year later shows relapse of the tumour in the frontotemporal lobe.

it also revealed an abnormality with lateralisation on the left side. An MRI scan revealed an intracranial mass in the right temporal lobe, with uncal herniation and a mass effect (figure 1).

The movement disorders observed on the right side could be explained by the pronounced tumour mass effect exerting pressure on right cerebellar tracts.

DIFFERENTIAL DIAGNOSIS

Diagnostic imaging revealed an intracranial mass. Differentiation between tumours and tumour-like lesions of the central nervous system is essential for planning adequate treatment and for estimating outcome and future prognosis. The classic tumour-like lesion is an intracranial abscess. On MRI, pus within the abscess typically shows restricted diffusion, whereas necrosis in the centre of malignant tumours typically shows an increased diffusion.⁷ As necrosis was visible in the MRI of our patient, a malignant tumour was suspected (figure 2).

To differentiate between a primary or secondary tumour, CT scans of the thorax and abdomen were obtained and revealed no abnormalities. The diagnosis of a primary brain tumour was

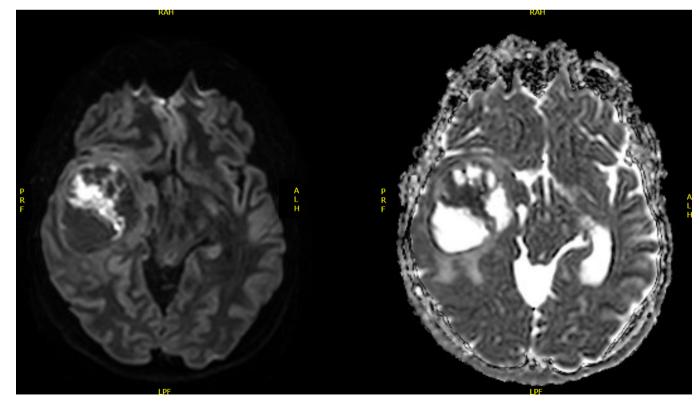


Figure 2 MRI scan of the brain, preoperative, diffusion image shows increased diffusion in the centre of the tumour.

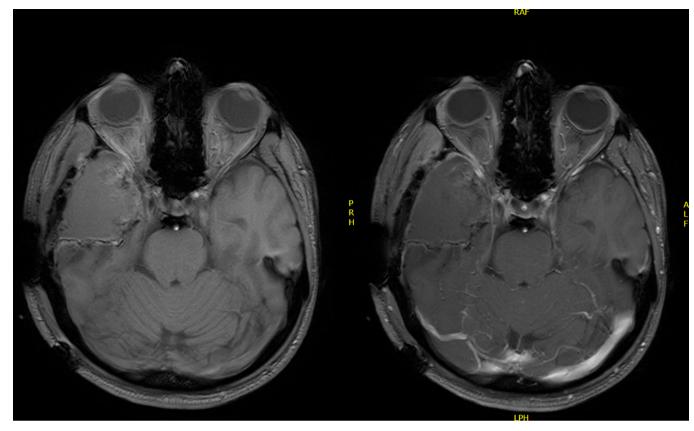


Figure 3 MRI scan of the brain, postoperative, T1-weighted image with contrast shows complete removal of the tumour.

made. A biopsy was required to confirm the type of tumour and its histopathological characteristics.

TREATMENT

The patient's catatonia was treated with lorazepam 1 mg, four times per day which resulted in a gradual improvement in the clinical picture. After the discovery of the brain tumour, the patient was transferred to a neurosurgical ward. Neurosurgical resection of the entire tumour was successful (figure 3). Histopathological examination showed a glioblastoma multiforme that required additional radiotherapy and chemotherapy (in the form of 60 Gy in fractions of 2 Gy, and temozolomide).

OUTCOME AND FOLLOW-UP

Postoperatively, catatonic signs and symptoms were not detectable. A frontal syndrome with disinhibition and logorrhoea persisted which gradually normalised over the following weeks. The frontal syndrome was considered to be the sequelae of parietotemporal oedema arising from the surgical intervention. The patient could resume work part-time 5 months after the operation. Outpatient psychiatric and psychotherapeutic treatment (because of postoperative depressive symptoms) aimed to attain a stable euthymic mood. In supportive psychotherapy, special attention was given to reactivation. Medication was not used.

One year later, the patient began to experience paroxysmal dysosmia and panic attacks. The diagnosis of focal temporal lobe epilepsy was made. Brain imaging showed relapse of glioblastoma multiforme in the frontotemporal lobe. Treatment with antiepileptics (levetiracetam) and chemotherapy (lomustine) was initiated. During the course of treatment, follow-up brain imaging 5 weeks later revealed further progression of the disease. The patient died 4 months later.

DISCUSSION

Brain tumours may be accompanied by a number of comorbidities. While brain tumours may directly affect patients' cognition, mobility, communication, perception and other neurological functions, these comorbidities may also greatly affect patients' quality of life.^{2 8-10} Among these comorbidities, depression is the most common.²⁸ A substantially higher incidence of major depressive disorder was found in adult patients with brain tumour compared with other adult, ambulatory patients with cancer.^{11 12} Systematic reviews and longitudinal studies suggest that approximately 15%-20% of patients with glioma will develop clinical major depressive symptoms during the first 8 months after diagnosis.^{13 14} The increased risk for depression may be maintained up to a year after surgical intervention.¹⁵ Depression, thus, is considerably more likely in patients with brain tumours than in the general population (where the point prevalence is approximately 5%).^{2 8 9 13 14}

Mood symptoms may be a forewarning of an evolving brain tumour.^{16 17} Patients with a brain tumour may initially present with psychiatric symptoms. In addition to depression, these symptoms may include personality change, abulia, apathy, hallucinations, mania, panic attacks and amnesia.¹⁸ These symptoms may be indistinguishable from such symptoms in patients with psychiatric disorders without brain tumours. Some studies show an increased incidence rate ratio for cancer in the months after a first-time psychiatric inpatient or outpatient contact. For brain tumours, an almost 19-fold increased incidence rate ratio during the first month has been reported, but also the incidence rates of small cell lung cancer have been found to increase sixfold during the first month, indicating that certain cancers might mimic psychiatric disorders.¹

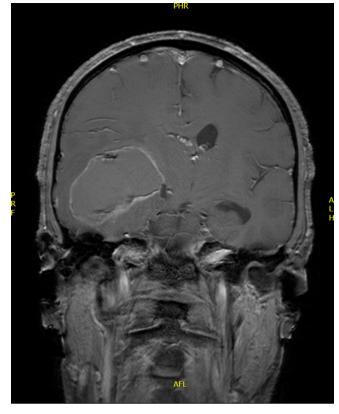


Figure 4 MRI scan of the brain, preoperative, T1-weighted coronal image shows the pressure on the thalamus and basal ganglia.

In our case, the patient presented with depression and catatonia. Catatonia is a syndrome of acute onset and a fluctuating course, first described by Kahlbaum in 1874.¹⁹ In his original description, 12 of 26 cases had a diagnosis of depression, while 14 of 26 had a somatic diagnosis (epilepsy, tuberculosis, neurosyphilis). Catatonia is seen in the context of mood disorders and psychotic disorders, but is also found among the systemically ill with infections, endocrine and metabolic disorders, and neurological disorders, including epilepsy.²⁰ The neurobiology of catatonia remains poorly understood. Due to ethical and practical concerns, functional neuroimaging studies have focused on patients with catatonia many days after acute presentation and treatment.^{21 22} The majority of studies have reported hypoactivity in cortical motor areas of the frontal and parietal cortices.²³ Patients with catatonia have been found to have a dysfunction of the 'medial motor system' which includes the supplementary motor area, thalamus and basal ganglia, consistent with impairment in self-initiated movements.²² Such patients also showed altered activation patterns and functional connectivity in the orbitofrontal and medial prefrontal cortex.²¹ In our patient, the intracranial mass exerted pressure on the thalamus and basal ganglia which could explain the catatonic symptoms (figure 4).

Reviews by Fink and Taylor²⁴ and Northoff²⁵ support an important role for dysfunction of the motor system involving frontal lobe basal ganglia circuitry or for interference with this system (through thalamic, parietal lobe, cerebellar or limbic abnormalities) in the mechanism of catatonia. The same circuits have been implicated in malignant catatonia and neuroleptic malignant syndrome (NMS).²⁶ Hyperthermia and autonomic dysfunction in malignant catatonia and NMS may arise from disrupted transmission between orbitofrontal structures and lateral hypothalamus. γ -Aminobutyric acid and dopamine are

prominent neurotransmitters in these motor circuits and in the hypothalamus.²⁷⁻²⁹

Our patient had a glioblastoma in the right temporal lobe, with uncal herniation and a mass effect. There are several reports of catatonia in the presence of temporal lobe lesions. The reported lesions include a temporal lobe infarct,³⁰ focal temporal encephalomalacia,³¹ temporal lobe resection³² ³³ and an inexplicable lesion in the temporal lobe.³⁴ It remains unclear how temporal lesions can cause a catatonic state, although it is possible that the presence of the tumour may have contributed to the dysfunction of the motor system. Whether, in our patient, catatonia symptoms are secondary to the tumour affecting the medial motor system, depression or both remains unclear.

Regardless of the aetiology, the principles in catatonia treatment stay the same.³⁵ Besides the treatment of the underlying cause, the first-line treatment of catatonia is still based on the use of benzodiazepines. Although catatonia of a neurological origin has been reported to respond less well to treatment (35), in our patient we witnessed a swift response to lorazepam. If benzodiazepines fail (inadequate or transient response, excessive sedation), electroconvulsive therapy (ECT) should be started without delay. If the underlying condition warrants ECT, or if a life-threatening situation emerges, such as malignant catatonia or NMS, ECT is the treatment of first choice.³⁶

Catatonia is a severe syndrome with excellent prognosis if recognised and treated appropriately, without delay.^{36 37} Catatonia discovered on physical examination should spur a medical investigation to uncover the probable cause.³⁸

Learning points

- Catatonia is a motor syndrome that accompanies various psychiatric and medical conditions, including brain tumours.
- Irrespective of the underlying cause of the catatonia, the principles in catatonia treatment stay the same. Nevertheless, it is also very important to treat the underlying cause.
- The emergence of a catatonic syndrome, most frequently in the presence of a psychiatric condition, should prompt the clinician to rule out medical conditions.

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