

Case Report

Panic attacks, a sequel of left temporal lobectomy in a patient with low-grade glioma

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ABSTRACT

Medial temporal lobe and associated limbic areas have vital role in processing of emotions. Amygdala, an important brain structure in processing of fear and anxiety has been implicated in the pathogenesis of panic symptoms. Brain pathology involving medial temporal lobe and amygdala can present with features of panic attacks. We highlight here a case of low-grade glioma, who had panic attacks following temporal lobectomy and improved with antidepressant (escitalopram) treatment.

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1. Introduction

Patients, who had undergone temporal lobectomy for intractable epilepsy had experienced anxiety in the post-operative period and it was more marked, when the surgery was done on the left side, an event attributed by the authors to the discontinuation of benzodiazepines (Bladin, 1992). Patients experience negative emotion like depression and poor socialization following left temporal lobectomy than those who had undergone right temporal lobectomy (Burton & Labar, 1999). A study revealed that extent of temporal lobectomy has association with depressive and anxiety symptoms in the post-operative period. Greater the extent of resection of hippocampus and amygdala on left side, more are the post-operative depressive and anxiety symptoms (Paparrigopoulos, Ferentinos, Brierley, Shaw, & David, 2008). There are several risk factors which predict the post-operative psychiatric outcome following temporal lobectomy. A younger age, preoperative anxiety and right temporal lobectomy are at an increased risk to develop mood and anxiety symptoms after surgery (Moss, O'Driscoll, Eldridge, Varma, & Wiesmann, 2009). Patients, who had normal amygdala volume and undergone ipsilateral mesial temporal lobe resection are also at higher risks to develop post-operative anxiety (Halley, Wrench, Reutens, & Wilson, 2010).

2. Case history

A forty year old non-diabetic, non-hypertensive female with no past history of psychiatric or major medical illness was referred for psychiatric consultation for episodes of intense anxiety following left temporal low grade glioma surgery. This patient had presented with repeated complex partial seizures to neurosurgical outpatient department. On imaging, the patient had a left temporal mass that was predominantly neocortical, that was T2 hyperintense and did not enhance with contrast (Fig. 1a–c). With the diagnosis of low grade glioma based on clinic-radiological findings, the neurosurgical team operated the patient. A gross total tumor excision was performed along with subpial resection of the mesial temporal structures (which includes hippocampus and amygdala), in an attempt to provide lasting seizure control (Fig. 1d). Histo-pathological examination of the tumor mass was suggestive of diffuse fibrillary astrocytoma of grade-II. Her immediate post-operative period was uneventful with normal language comprehension and visual function. On the fourth post-operative day, she had an episode of intense anxiety characterized by – palpitation, sweating, choking sensation in the throat and feeling of impending doom, which persisted for around 30min. She was evaluated for all possible cardio-respiratory causes with no success. She had a similar episode on the very next day, which subsided spontaneously as the previous one. The neurosurgical team escalated the anti epileptic considering it to be breakthrough seizures.

The patient had experienced these episodes more frequently (2–3 episodes) in the subsequent days which was incapacitating for her, hence was referred for psychiatric consultation.

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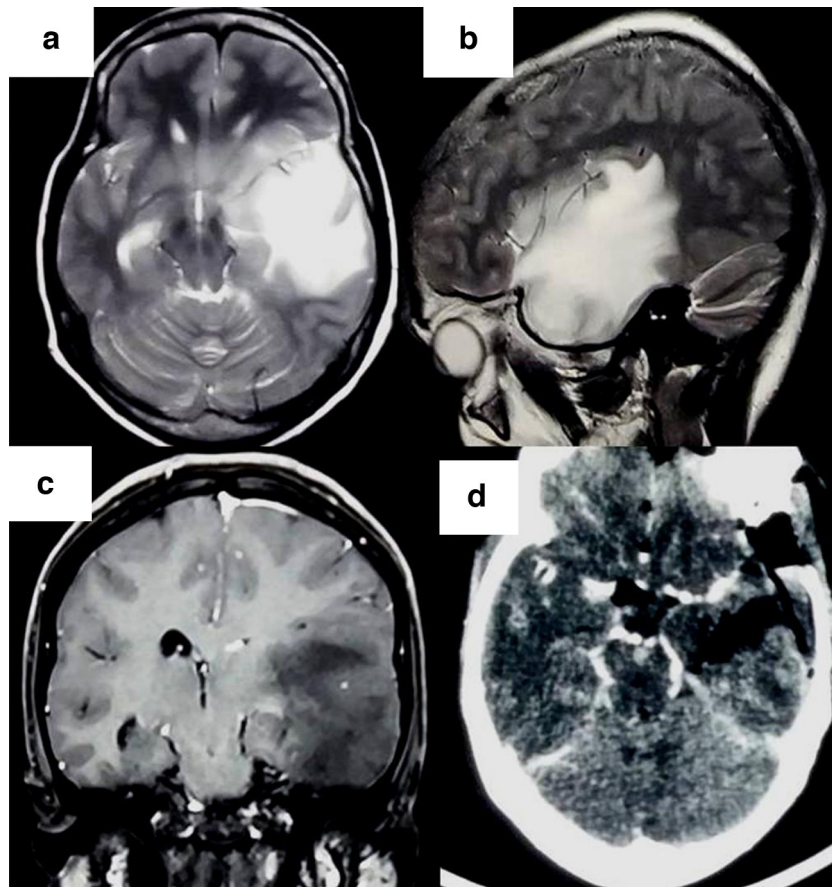


Fig. 1. T2 weighted MRI of the brain a hyperintense mass occupying the left temporal lobe, extending from the temporal pole till the plane of the collicular plates (1a). The entire lateral temporal lobe is replaced by tumor right from the sylvian fissure till the temporal base (1b). The medial temporal lobe appears normal although there is evidence of midbrain compression by it (1a). The mass is non-enhancing on T1 contrast (coronal) image (1c). The compression of the ipsilateral lateral ventricle including the temporal horn is well seen on coronal image (1c). Postoperative scan shows surgical cavity with evidence of craniotomy (1d).

Electroencephalogram ruled out seizure in the patient. The patient was receiving antiepileptic prophylaxis (levetiracetam 1000 mg/day). The patient had insignificant past and family history. She was a housewife with adequate pre-morbid functioning. There was no association of psychosocial factors that might attribute to such manifestations. Her routine blood investigations, renal function test, thyroid function test, serum electrolytes, lipid profile were within normal limits.

The patient was prescribed escitalopram 5 mg/day and clonazepam 0.5 mg/day for her panic attacks. Later the dose of escitalopram was escalated to 10 mg/day in at a follow up of 4 weeks due to partial response. She had shown significant improvement to this dose escalation and was absolutely symptom free at her follow up at 3 months.

3. Discussion

Our patient did not have any pre-morbid anxious state. Insignificant past and family history, absence of other medical causes and psychosocial stressors are indicative of correlation of panic attacks with the temporal lobe surgery involving removal of amygdala. In our patient amygdala was not involved by tumor and the patient also did not report about panic attack before surgery. This neurosurgical intervention resulted in removal of anterior part of left temporal lobe (the uncus, which was specifically removed by neurosurgeons to prevent postoperative chances of transtentorial herniations) including amygdala. Amygdala is an important structure associated with antero-medial part of the

temporal lobe. It has a major role in processing of fear and anxiety. Fear and anxiety occurs from hyperfunctioning/hyper-sensitiveness of amygdala (Goossens, Sunaert, Peeters, Griez, & Schruers, 2007; Onur et al., 2009; Yoon et al., 2016). Our patient, had developed panic attacks after removal of left amygdala and anterior part of temporal lobe. Considering the existing evidences, we hypothesize that removal of amygdala during unilateral temporal lobectomy might have resulted in the hyper-functioning of the contralateral amygdala in processing these negative emotions in our patient.

We also considered a differential diagnosis of seizure (temporal lobe epilepsy like). It is known that patients with temporal lobe epilepsy may present like panic attacks with normal electroencephalogram and neuroimaging findings (Gallinat & Hegerl, 1999; Saegusa et al., 2004). However, as the patient was on antiepileptic medication and the panic symptoms improved with escitalopram (antidepressant), which is more suggestive of non-epileptic origin of the symptom.

This report also witnesses that conventional pharmacological treatment recommended for treatment of panic disorders (i.e. selective serotonin reuptake inhibitors) can be safely prescribed to these patients with noticeable outcome. Considering the safety profile of various selective serotonin reuptake inhibitors (SSRIs), escitalopram can be a good choice. Early intervention in panic disorder may regulate the hyperfunctioning amygdala and control the anxiety symptoms more effectively. There is need to study the volume change, functional connectivity, metabolic activity, perfusion changes in contralateral amygdala after

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