Clinical Neurology and Neurosurgery 164 (2018) 53–56

Contents lists available at ScienceDirect

Clinical Neurology and Neurosurgery

journal homepage: www.elsevier.com/locate/clineuro

Full Length Article

Brain tumors associated with psychogenic non-epileptic seizures: Case series

Catherine R. Garcia[e], Gulam Q. Khan[b], Amy M. Morrow[c], Priyanka Yadav[b], Donita D. Lightner[b], Frank G. Gilliam[b], John L. Villano[a,b,d,e,*]

[a] Department of Medicine, University of Kentucky, Lexington, KY, United States
[b] Department of Neurology, University of Kentucky, Lexington, KY, United States
[c] Department of Clinical Oncology Pharmacy, University of Kentucky, Lexington, KY, United States
[d] Department of Neurosurgery, University of Kentucky, Lexington, KY, United States
[e] Markey Cancer Center, University of Kentucky, Lexington, KY, United States

ARTICLE INFO

Keywords:
Pseudoseizures
Psychogenic non-epileptic seizures
Outcomes
Brain neoplasm

ABSTRACT

Objective: The association of psychogenic non-epileptic seizures (PNES) with primary or secondary brain tumors has not been well described in the literature. We aim to discuss their association, and their impact in brain tumor treatment.

Patients and methods: We identified four patients retrospectively from our practice. The diagnosis of PNES was based on clinical suspicion and standard EEG, supplemented with video-EEG recording in 2 patients.

Results: The initial diagnosis of brain tumor was associated with a new onset seizure prior to diagnosis. The majority of the patients presented with ES followed by recurrent PNES during the course of their disease. Patients were treated with multiple anti-epileptic drugs, requiring frequent schedule adjustments. The preferred tumor treatment modality was chemotherapy, followed by surgical resection. The patients were offered psychological consultation achieving partial control of their events. These patients manifested recurrent disabling clinical events that required multiple medical consultations. None of these patients presented clinical evidence of tumor progression at the time of PNES presentation.

Conclusion: A high index of suspicion and early psychological consultation referral will likely mitigate the quality of life impact of PNES in these patients.

1. Introduction

Epileptic seizures (ES) are reported in over 20% of patients with gliomas [1]. Seizure control is related to the patient's quality of life and is considered an indicator for treatment response [2]. Both epileptic seizures (ES) and psychogenic non-epileptic seizures (PNES) have similar clinical findings. However, PNES are associated with a wide range of motor, sensory, and mental symptoms without developing epileptogenic electrical activity. PNES are considered a component of conversion disorder [3]. Their presence may be related to past stressing events, such as psychological and physical trauma, including past medical interventions [4], and psychiatric comorbidities, particularly post-traumatic stress disorder (PTSD) [5].

Neuro-oncology literature focuses on ES in association with brain tumors [6], with no clear documentation of PNES. The therapeutic implications of PNES in oncological cases are not well established; a high suspicion index may prevent unnecessary medical interventions. We present four cases with PNES after brain tumor treatment, representing the largest description of PNES in association with brain tumors.

2. Patients and methods

We present a series of four patients from our practice with diagnosis of PNES and medical history of primary or secondary brain tumors. The diagnosis of PNES was clinically based with consensus from at least two physicians that included a neuro-oncologist and an epilepsy neurologist supplemented by standard EEG, and video-EEG in two patients. Cognitive functions remained largely unchanged in all the patients. A summary of the descriptive characteristics of each patient can be found on Table 1.

This manuscript was approved by the University of Kentucky Hospital Ethics Committee in accordance with the Declaration of Helsinki.

Abbreviations: ES, epileptic seizures; PNES, psychogenic non-epileptic seizures; EEG, electroencephalogram; AED, antiepileptic drugs; TMZ, temozolomide

* Corresponding author at: University of Kentucky, 800 Rose St., CC446, Lexington, KY 40536-0093, United States.
E-mail address: jlvillano@uky.edu (J.L. Villano).

https://doi.org/10.1016/j.clineuro.2017.11.013
Received 9 October 2017; Received in revised form 31 October 2017; Accepted 14 November 2017

Table 1
Summary of patient's characteristics at the time of PNES diagnosis.

Case	Sex	Tumor	Ttx	SS	MRI	PNES	KPS
1	F	Grade II oligodendroglioma of Left frontal lobe	Surgery, CT	Migraines, hallucinations	No new lesions	D	60
2	M	Grade III anaplastic astrocytoma of right precentral gyrus and right paracentral lobule	Surgery, CT	Nightmares, drowsiness, slower cognition	No new lesions	CE	70
3	F	Grade III anaplastic oligodendroglioma of left frontal lobe	Surgery, CT and RT	Headaches, slower cognition and fatigue	No new lesions	D	60
4	F	Metastatic adenocarcinoma of lung	WBRT, Gamma Knife and CT	–	No new lesions	CE	70

F: Female; M: Male; Tx: Initial treatment; SS: significant symptoms; KPS: Karnofsky Performance Score; CT: Chemotherapy; RT: Radiotherapy; WBRT: Whole-brain radiation; D: Documented PNES; CE: Clinically established PNES.

3. Results

3.1. Case 1

Late-thirties-year-old female diagnosed with recurrent left frontal grade II oligodendroglioma IDH mutant 1p/19q co-deleted, since 2009 after new onset generalized tonic-clonic (GTC) seizure. She underwent primary resection and in September 2016, due to evidence of progression she underwent a second resection with concurrent temozolomide (TMZ). A month after her surgery she presented several episodes characterized by an electric shock sensation associated with twitching of her lower extremities, lasting less than a minute without loss of consciousness. She became progressively weaker resulting in limited ambulation and her spells increased numerically with addition of post episodic confusion and amnesia. Concomitantly she suffered from headaches, blurry vision, mild visual hallucinations, low back pain, daily fevers, and intermittent nausea and vomiting. The frequency of these episodes was 4–5 times per week for 4 months when she was then readmitted and underwent video-EEG for 24 h for spell-characterization (Supplemental video 1). Her spells were determined non-epileptic in nature (PNES). A summary of her current AED includes gabapentin 800 mg TID, lacosamide 100 mg BID, and clonazepam 0.5 mg BID. She was previously treated with pregabalin, valproic acid and levetiracetam, which were discontinued due to side effects (tremors and irritability), and ineffectiveness. She was referred for psychological consultation and narrative medicine. On follow up, she presented scattered episodes of PNES for 8 months and is presently seizure free for 4 months (last episode in June 2017). She is currently on maintenance TMZ without evidence of tumor progression.

3.2. Case 2

Mid-thirties-year-old male diagnosed with a right precentral gyrus and right paracentral lobule grade III anaplastic astrocytoma (IDH WT) since July 2015 after new onset seizure. His initial treatment included resection and concurrent chemoradiation. Five months later he was suffering around 100 focal seizures a day, characterized by mouth deviation to the left, left eyelid twitching, and tremulous movements of the left hand. His ES partially improved with epileptogenic focus resection, proven to be tumor progression. A year later, he continued to present with focal seizures, reporting at least one episode per day. He was started on maintenance TMZ since January 2016 and was later change to dose dense TMZ in April 2016 due to concerns of progression.

On follow up, the patient was clinically stable with residual symptoms of daytime somnolence, mild dysarthria, and left hemiparesis. In April 2017, he presented with an episode in the clinic with eyes tightly closed, side to side head movements, semi-rhythmic jerking of all extremities, vigilant about not falling from the examination table, and able to protect his airway. When the medical team tried to slide him up the examination table, his jerking stopped and he assisted in moving himself up. He then resumed his semi-rhythmic jerking for approximately 5 min. He reverted to himself without post-ictal period and was diagnosed as clinically established PNES. He reported similar episodes around 3 times per week for the past 2 months. All of these episodes are strongly concerning for the patient and motivates him to consult the medical team multiple times per week. He was started on psychological counseling and he is currently on follow up. The patient continued to present scattered episodes of both ES and PNES for three months (his last PNES was in May 2017). He is currently on clonazepam 0.5 mg AM and1 mg PM, levetiracetam 2000 mg BID, lacosamide 200 mg TID, and gabapentin 300 mg BID.

3.3. Case 3

Mid-thirties-year-old female diagnosed with left frontal grade III anaplastic oligodendroglioma, (IDH mutant, 1p/19q co-deleted) who initially presented with a new-onset GTC seizure in June 2016. She underwent primary resection, adjuvant radiotherapy and began chemotherapy with procarbazine, lomustine and vincristine in September 2016. She was seizure free for 6 months, when she started to experience several uncharacterized spells and was hospitalized for seizure control. She underwent vEEG for 24 h, where she presented several episodes of stereotyped events without loss of awareness. Her typical events are described as head tilting to the left with mouth opened, and generalized hypotonia for about 15 s, followed by heavy breathing (Supplemental video 2). She is unresponsive to the medical staff during the events. The EEG recordings during these events showed muscle artifact without evolution to epileptiform activity; her spells were diagnosed as PNES and she was referred to psychological therapy. She continues to present scattered episodes of PNES a year out of her initial episode, requiring readmissions and frequent clinic visits. Her last PNES was reported in October 2017. A summary of her current AED includes levetiracetam 1000 mg BID, lorazepam 0.5 mg TID, venlafaxine 37.5 mg OD, and gabapentin 300 mg BID.

3.4. Case 4

Late-forties-year-old female with diagnosis of adenocarcinoma of lung, stage IVB with multiple brain metastasis, since September 2012. She was treated with whole brain radiation therapy (WBRT) and chemoradiation with cisplatin and etoposide. During the following 3 months, there was evidence of progression on a CT scan of the chest showing enlarged mediastinal nodes. In March 2013 there was evidence of extensive CNS involvement for which she was treated with Gamma Knife. She was then initiated on systemic therapy with pemetrexed and bevacizumab.

During follow up, she was diagnosed with peripheral neuropathy and was otherwise doing well. In September 2015, when she presented an episode of generalized weakness, lower extremities rhythmic movements, in addition to the inability to speak for approximately 5 min. During the episodes she is able to continue her activities without interruptions or falling. These episodes were videotaped, and upon