

CASE REPORT

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Somatosomesthetic hallucinations in parietal lobe seizures: A case report

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ABSTRACT

Introduction: A transient occurrence of signs and symptoms brought on by excessive abnormal neuronal or synchronous activity in the brain is known as an epileptic seizure. By way of onset, seizures can be classified as focal, generalized, unknown, or unclassifiable. An underlying structural abnormality can cause focal seizures in the brain. Among these, the temporal lobe is the most prevalent, but there may be alterations in the frontal, occipital, and parietal lobes. The objective of this case report is to contribute to the knowledge of the multiple symptoms of patients with parietal lobe seizures.

Case Report: The report is about parietal aura, diagnosed in the patient J.F.R., a 45-year-old male, and reported his first seizure in 2017. The patient said the increasing onset of the condition leads to significant body image disorders (the representation of the child during eye contact is similar to that of a monster). A limb or a body side may also appear heavier, more significant, absent, or separate from the rest of the body. The post-ictal period was slow, and full consciousness and correct body image emerged insidiously.

Conclusion: In the evaluation, it is essential to value not only the main complaint but also the entire psychic context, cognitive function, and interpersonal and social relationships since these aspects can affect the quality of life of these patients and their integration into the social environment.

Keywords: Epilepsy, Parietal lobe epilepsy, Somatosensory seizures, Tonic-clonic seizures

How to cite this article

Santos de Assis AP, Antunes DP, Santos PSM, Rosa ALG, Orsini M, da Silva Catharino AM. Somatosomesthetic hallucinations in parietal lobe seizures: A case report. Int J Case Rep Images 2022;13(2):180–184.

Article ID: 101356Z01AS2022

doi: 10.5348/101356Z01AS2022CR

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Received: 05 August 2022
Accepted: 15 October 2022
Published: 08 December 2022

INTRODUCTION

The parietal lobe is a brain structure posterior to the central sulcus under the parietal bone. It is directly related to the occurrence, at complex levels, of somatosensory processing. Somatosensory areas are found in the parietal cortex, with additional specialization for sensitivity to movement and areas that present complex receptive fields for the visual system, predominantly in the posterior parietal cortex [1, 2].

In the parietal cortex, Brodmann's cortical areas 5 and 7 play essential roles in interpreting the deeper meanings of sensory information between the somatosensory areas. These areas are called somatosensory association areas [1].

The primary somatosensory cortex projects to the motor area in the frontal lobe and the somatosensory

association area in the parietal cortex. Parietal associative areas integrate somatosensory information with other sensory modalities to create a spatial perception of objects in extrapersonal or distant space. The posterior parietal cortex establishes connections with structures in the prefrontal cortex that are involved in planning and executing eye and hand movements, playing an essential role in visual guidance of motor behavior and perception, spatial cognition, and understanding where objects are situated about each other [3].

Injuries to areas of the parietal lobe can cause some neurological disorders, such as neglect syndrome, in which a part of the body or a part of the world is ignored, and its existence is denied. Individuals with lesions in areas of the parietal lobe may present abnormalities in body self-image and the perception of spatial relationships. In its most pronounced manifestation, the patient ignores the side of the body, and the rest of the world, which is on the opposite side of the parietal lesion. Damage to the parietal cortex, too, involves disconnection injuries that result in conduction aphasia [2].

Some parietal cortex lesions produce the inability to perceive objects through normally functioning sensory mechanisms, a condition called agnosia, complex defects in the perception of personal or peripersonal space, visual-motor integration, and selective attention [1, 2]. These lesions result in a broad spectrum of behavioral impairments, impairments in body perception, motor control and visual orientation of motor behavior, and impairments in spatial perception and cognition related to abstract spatial thinking [3].

Some disorders, such as copying and drawing, damage the parietal cortex. Complex figure drawings are imprecise, whether drawn from a model or memory. The problem arises from an inability to perceive the spatial relationships between the parts of an object. These patients can recognize things but often cannot draw them well [3].

When symptoms such as paresthesia or pain appear prominently, the crisis's origin in the parietal lobe should be suspected. However, most patients with parietal lobe seizures do not have symptoms or signs suggestive of the parietal lobe. Although the parietal cortex occupies the second largest cortical surface in the brain, parietal lobe epilepsy accounts for only 6% of patients who receive epilepsy surgery in large epilepsy centers [4].

Epilepsy is a chronic disease of recurrent seizures ranging from brief symptoms to periods of vigorous agitation and seizures. It is estimated that epilepsy affects approximately 1% of the population, which means 65 million people worldwide, being more common in developing countries. The diagnosis of epilepsy occurs most often in young children and the elderly [2].

Epileptic seizures can be classified into focal seizures, which are limited to a focal area of one cerebral hemisphere, and generalized seizures, which diffusely affect both hemispheres of the cerebral cortex [5]. Its causes can sometimes be identified, including tumors, trauma, genetics, metabolic problems, infection, and

vascular disease, although in many cases, the cause of epilepsy is not known [3].

In epilepsy, there is a symptom complex with multiple risk factors and a solid genetic predisposition rather than a condition with a single expression and cause. Given this, there are neurobiological, cognitive, and psychosocial consequences [6].

Focusing on the disorders and their relationship with epilepsy is necessary since it commonly occurs in patients with foci of their seizures in the frontal lobe, temporal lobe, and parietal lobe [7].

Globally, an estimated 5 million people are diagnosed with epilepsy each year. In high-income countries, there are estimated to be 49 per 100,000 people diagnosed with epilepsy each year. In low- and middle-income countries, this figure can be as high as 139 per 100,000. The incidence of epilepsy in the general population is between 0.5% and 1.5% [8].

Due to the subjective nature of parietal lobe seizures, diagnosis can be challenging. There are frequently both positive and negative sensory characteristics. Sensorimotor phenomena and vestibular hallucinations suggest parietal lobe onset. There may be vertiginous symptoms, paresthesias, visual hallucinations, and somatic illusions. Receptive language impairment can result from dominant hemispheric seizure-related disorders. Auras like epigastric sensations, visual hallucinations, panic attacks, and behavioral arrest can accompany complex partial parietal lobe seizures. As the episode grows, additional wolves are frequently involved. The temporal lobe can be affected by focal parietal lobe seizures, leading to loss of consciousness and automatisms [5, 6].

A transient occurrence of signs and symptoms brought on by excessive abnormal neuronal or synchronous activity in the brain is known as an epileptic seizure. By onset, seizures can be classified as focal, generalized, unknown, or unclassifiable.

Complex partial seizures are the most frequent seizure type in epilepsy patients after the first year of life. About 36% of people with epilepsy are thought to experience complex partial seizures and relate to all ages. Young children and the elderly are more likely to share it. There is no known preference for sex or race [6, 8].

Focal seizures can propagate, leading to the involvement of other areas of the cerebral cortex. This propagation can lead to the participation of a large part or all of the cortex (secondarily generalized crisis); the initial symptoms indicate the cortical region initially affected.

The association of epilepsy with mental disorders is worth mentioning since patients with epilepsy have strong neurotic traits and somatization. Psychotic symptoms, such as hallucinations, may occur as part of a seizure or in a prolongation of non-convulsive cases of epileptic seizures [7].

The evaluation of patients with epilepsy should not be restricted to their primary complaint but to the entire psychic context, cognitive functions, interfamily and

social relationships [6, 7]. Neurological examination of parietal lobe epilepsies has described visual field defects and language disturbance. Patients with impaired spatial ability were unable to reproduce complex images and drawings [9].

No specific cognitive tests for parietal lobe seizures were found in the literature. Of all types of epilepsy, temporal lobe epilepsy is the most frequently involved during a psychotic condition and is associated with a higher risk of developing psychiatric disorders. Psychoses in epilepsy can be classified according to their temporal relationship to the seizure [10, 11].

The objective of this report is to contribute to the knowledge of the multiple symptoms of patients with parietal lobe seizures.

CASE REPORT

This case report concerns parietal aura, diagnosed in the patient J.F.R., a 45-year-old male. The patient reported that his first seizure occurred in March 2017. He narrated that when presenting for a job meeting, he noticed a massive growth in his hands associated with random movements around the cervical region. A few minutes later, he started a focal seizure with secondary generalization. This fact always persevered in the prodromal phase.

The patient reported increasing onset of the condition, leading to significant body image disorders (the representation of the child during eye contact is similar to that of a monster, as well as that of a tree located on the side of his house, giving him the impression of the branches showing life and search, incessantly to remove it from the ground) (Figure 1). A limb or a body side may also appear heavier, larger (Figure 2), absent or separate from the rest of the body. A fact that drew attention was the “absence” of the genital region during the voiding act, sometimes causing embarrassment to family members due to not hitting the toilet seat. He claims it is displaced, extended, or retracted into the body several times. The post-ictal period is slow, and full consciousness and correct body image emerge insidiously.

DISCUSSION

Epilepsy is a “brain dysfunction characterized by a permanent predisposition to generate epileptic seizures.” In this sense, it is known that, during an epileptic crisis, the patient may present several signs and symptoms due to abnormal and excessive neuronal activity in the brain. For this reason, mainly, the International League against Epilepsy (ILAE), in 2014, defined epilepsy not as a disease, but as a syndrome, based on the assumption that these activities are heterogeneous [5, 12].

Parietal lobe seizure, although rare, accounts for about

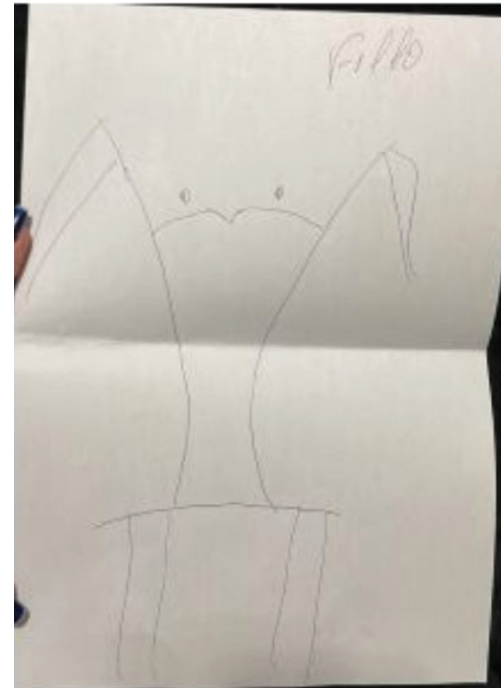


Figure 1: Representation of the child during eye contact.

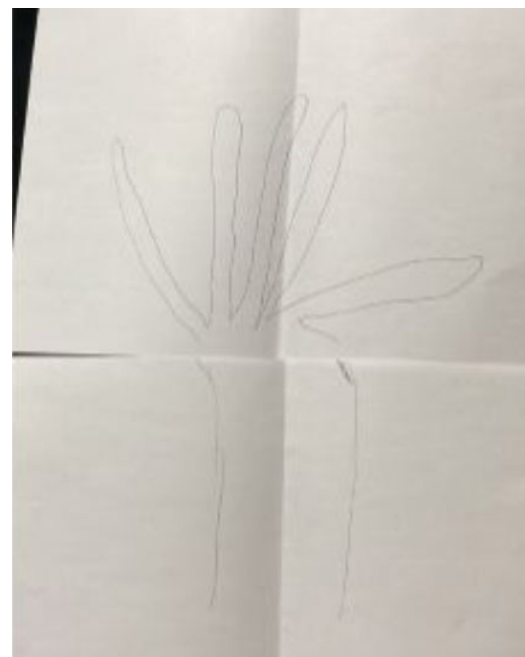


Figure 2: Representation of his hand.

5% of all episodes experienced by people with epilepsy.

During the crisis, there is a greater complexity regarding its definition since its clinical characteristics may reflect the spread to other areas of the cerebral cortex [13]. Studies suggest that the most common manifestation, which is also present in the patient in question, is a somatosensory aura.

A sensory aura involves a sensation without necessarily

presenting an objective clinical sign; before that, it can present itself in different ways, such as visual, auditory, olfactory, and epigastric. This manifestation during the seizure may be ipsilateral or contralateral to the epileptic focus [14].

Given this, ictal features are usually subjective and can include positive and negative traits [14].

Observing the clinical features of the patient's generalized signs and symptoms, there are visual hallucinations, tremors, post-crisis pain, mood and personality instability, paresthesias or pain, and, prominently, the generalized tonic-clonic lobe seizure. Parietal bone appears to be a likely diagnosis [14].

In terms of background, the fact that the patient describes visualizations of hands and large windows, that is, larger than their normal size, suggests a detrimental effect of the seizure on sensitive structures in the parietal cortex, in the somatosensory area [3]. Furthermore, the onset of hallucination is spaced around 30 years with the first absence of seizure. He did not perform an electrocardiogram (ECG), although the possibility of having seizures was not excluded.

This diagnosis is also compatible with psychosis, as the development of neuropsychological disorders may also be present in patients with epilepsy, mainly due to childhood onset [15].

The psychological assessment during the anamnesis conversely identified the patient's mood and personality instability. Therefore, it is known that there is difficulty correlating psychosis as secondary to epilepsy.

There is still much controversy in the literature, so the hypothesis of possible primary psychiatric diseases or side effects of antiepileptic drugs should not be ruled out [16]. However, studies indicate that mental disorders are present in up to 70% of cases and may influence an underlying pathology, such as cognitive behavioral disorders [15, 17].

There is a greater risk of developing neuropsychological disorders in poorly controlled conditions. Therefore, it is necessary to optimize the anticonvulsant medication, even though it can worsen psychosis [18]. In the case in question, the patient is being followed up by neurology, and treatment with 50 mg of Lamotrigine was started. This medication is promising, as it can be used to control both epileptic seizures and bipolar disorders.

In addition, quetiapine administration at 25 mg overnight was necessary to improve visual hallucinations. Given this clinical-pharmacological scenario, an improvement in the quality of sleep and the quality of life of the patient under analysis is expected.

CONCLUSION

In evaluating an epileptic patient, it is essential to value not only the main complaint but also the entire psychic context, cognitive function, and interpersonal and social relationships, as these aspects can affect the quality

of life of these patients. It can be concluded. Therefore, it is the importance to investigate the possible causes of the association of epilepsy with mental disorders, aiming at an adequate clinical approach for these patients since patients with epilepsy have strong neurotic traits and somatizations originating from brain organics. Psychotic symptoms, such as hallucinations, may occur as part of a seizure or an extension of non-convulsive cases of epileptic seizures

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Author Contributions

Ana Paula Santos de Assis – Conception of the work, Design of the work, Analysis of data, Interpretation of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Daniel Pereira Antunes – Design of the work, Acquisition of data, Analysis of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Paula Stephany Maciel Santos – Conception of the work, Design of the work, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Marco Orsini – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Antônio Marcos da Silva Catharino – Conception of the work, Design of the work, Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

The corresponding author is the guarantor of submission.

Source of Support

None.

Consent Statement

Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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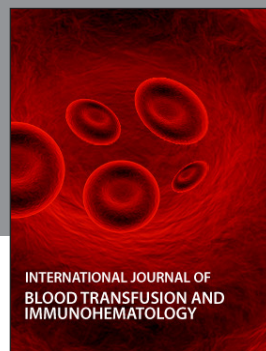
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