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# Epilepsy Surgery in Patients with Coexisting Psychogenic Nonepileptic Seizures: Diagnosis and Treatment

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**ABSTRACT**

The prevalence of epileptic seizures among patients with psychogenic nonepileptic seizures may range from five to fifty percent. Diagnosis of both conditions occurring in association may be difficult and requires both clinical skills and prolonged video-EEG monitoring. Occurrence of seemingly psychogenic events during video-EEG monitoring should be interpreted with caution, and the relative role of both psychogenic and epileptic seizures in day-to-day living should be carefully evaluated for each individual patient. Surgery is not contraindicated in this setting, however patients and family members should be educated about both conditions before surgical decision. Psychogenic seizures and other psychiatric co-morbidities should be properly assessed and treated before surgery. Diagnosis and management of postoperative events (epileptic or psychogenic) is challenging. This difficulty can be minimized by appropriate presurgical management, that includes diagnostic testing, neurologic and psychiatric treatment and patient and family counseling.

**Key words:** epilepsy surgery, psychogenic nonepileptic seizures, pseudoseizures, video-EEG, treatment.

**RESUMO**

***Crises não-epilépticas e cirurgia na epilepsia: uma revisão***

A prevalência de crises epilépticas entre pacientes com crises não-epilépticas psicogênicas varia entre cinco e 50%. A diagnóstico desta comorbidade pode ser difícil, e requer experiência clínica, além de monitorização prolongada por vídeo-EEG. A ocorrência de eventos sugestivos de crises não-epilépticas durante a monitorização por vídeo-EEG deve ser interpretada com cautela. O papel relativo de cada uma das co-morbidades na vida diária do paciente deve ser avaliada caso a caso. Não há contra-indicação formal para a cirurgia, contudo pacientes e familiares devem ser esclarecidos acerca de ambos os diagnósticos e as crises psicogênicas e outras comorbidades psiquiátricas devem ser diagnosticadas e tratadas adequadamente antes da cirurgia. O diagnóstico e tratamento de eventos epilépticos ou psicogênicos que ocorram após a cirurgia é ainda mais difícil, porém esta dificuldade pode ser minimizada com uma avaliação pré-operatória cuidadosa, que inclui diagnóstico e tratamento neurológico e psiquiátrico precisos, além de aconselhamento a pacientes e familiares.

**Unitermos:** cirurgia de epilepsia, crises não-epilépticas psicogênicas, pseudocrises, vídeo-EEG, tratamento.

## INTRODUCTION

The diagnosis of nonepileptic psychogenic seizures in patients with coexisting epilepsy represents a major challenge not only to neurologists, but also to the experienced epileptologist. The diagnosis of psychogenic nonepileptic seizures can be missed in patients with refractory epilepsy, including those undergoing longterm video-EEG monitoring for presurgical evaluation.[6,7,8,9]

Prevalence estimates of epilepsy among patients with psychogenic nonepileptic seizures are variable, ranging from five to almost 50% of cases. Prevalence of psychogenic seizures among patients with epilepsy and

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medically refractory epilepsy is even more difficult to establish.[2,8]

Establishing the correct diagnosis of psychogenic seizures is of utmost importance in patients with isolated nonepileptic psychogenic seizures and in those presenting with nonepileptic seizures and epilepsy, particularly in patients with medically refractory epilepsy being evaluated for epilepsy surgery.[2,12,13]

## DIAGNOSIS

The possibility of an association of both diagnoses should be considered by the clinician in all cases of refractory epilepsy being evaluated for epilepsy surgery. [2,3,10] The first clue to the correct diagnosis may be apparent in the history. Although the diagnosis of nonepileptic psychogenic seizures cannot be established by history alone, the suspicion should be raised when a careful history elicits the occurrence of different seizures types or clinical features suggestive of nonepileptic psychogenic seizures, such as side-to-side head movements, asynchronous limb movements, opistotonus, pelvic thrusting, ictal crying or eye closure during the seizure.[1,3-6] Other red flags include nonstereotyped seizures, prolonged periods of unresponsiveness during seizures, especially with a waxing and waning quality, erratic response to antiepileptic drugs, as well as a paucity of EEG abnormalities in the setting of frequent uncontrolled seizures.[1,3-6] The diagnosis can be missed even by the experienced epileptologist. Video-EEG monitoring is a fundamental tool for a precise diagnosis.[2]

### Video-EEG monitoring

Video-EEG monitoring should be carefully planned and of sufficient duration to allow the diagnoses of both seizure types. If the diagnosis is of NEPS is suspected, duration of video-EEG monitoring should be extended as long as necessary to allow a precise diagnosis. If antiepileptic drugs are rapidly withdrawn or tapered with the aim of recording seizures, NEPS may be missed.[2]

The occurrence of an event with clinical features of a NEPS in the setting of video-EEG monitoring must be interpreted with caution, since this type of event may occur in three different scenarios:

- Firstly, patients with epilepsy may present with simple partial seizures without an EEG correlate. Some patients will also, probably unconsciously, embellish symptoms, displaying clinical features of a psychogenic event superimposed on a simple partial seizure. Also, some patients with epilepsy may present prolonged periods of simple partial seizures without an EEG correlate and this may lead to an erroneous interpretation that the seizure is a psychogenic event.[11]
- Secondly, in the setting of video-EEG monitoring, some patients may present with an atypical psychogenic event, which does not represent the clinical event that occurs in everyday life, outside the video-EEG setting.[8] Especially when video-EEG monitoring is long, the pressure of the medical and nursing staff in the unit to record a seizure may, on occasion, induce the occurrence of a psychogenic event. We have not uncommonly witnessed this type of event when the staff is prepared to inject the radiotracer for ictal SPECT.
- Finally, the event may represent a *bona fide* NEPS that can be clinically relevant, also occurring outside the video-EEG setting.

In order to establish the clinical relevance of all seemingly psychogenic events, it is of utmost importance that the occurrence of the event outside the video-EEG setting be confirmed with the patient and other people that have witnessed the patients' seizures outside the monitoring setting.

In some monitoring units, induction of a nonepileptic psychogenic seizure through suggestion is used as a confirmatory evidence of the psychogenic nature of the event. Most patients with NEPS are very suggestible and NEPS are easily induced and aborted in the great majority of patients with NEPS. Caution should be exercised when performing induction maneuvers in the video-EEG setting, since a minority of patients with epilepsy that do not present psychogenic events, may produce a psychogenic event during induction. If an induction maneuver is to be used, all events should be shown to the patient and family and be confirmed to occur outside the video-EEG setting.[8]

A limitation to the diagnosis of NEPS in the video-EEG setting is that psychogenic seizures may not occur during the monitoring period, especially if they occur infrequently, since duration of video-EEG monitoring rarely exceeds seven days. Despite all precautions for adequate video-EEG monitoring, the diagnosis of NEPS can still be missed.

## MEDICAL AND SURGICAL DECISIONS REGARDING CO-EXISTING PSYCHOGENIC SEIZURES AND EPILEPSY

If a psychogenic event occurred as an isolated event in the video-EEG monitoring, no further action is warranted, other than explaining the situation to the patient. In these cases, surgical decision should not be influenced by the occurrence of these events.

Psychogenic events occurring as an embellishment of simple partial seizures can be trickier, since the precise mechanism of the event is incompletely understood. Although a psychiatric evaluation may be warranted, it must be kept in mind that in these cases, poorly controlled

seizures are the underlying phenomenon and surgical decision should not be modified by the occurrence of a superimposed psychogenic event.[11]

Surgical decision can be difficult in patients presenting with both NEPS and epilepsy. In these cases, the neurologist and epileptologist in charge of the patient must establish the relative contribution of each of the two conditions to the patients' clinical picture.

In a first scenario, epilepsy may be adequately controlled, but NEPS represent the true problem regarding seizure refractoriness. In these cases, patients should be followed by both the neurologist and a psychiatrist who are knowledgeable of the treatment of patients with NEPS. Psychiatric co-morbidities, such as anxiety disorders, depression and personality disorders, should be appropriately diagnosed and treated. Patients and relatives should be educated by the neurologist to recognize and differentiate the two types of events. If, after appropriate intervention, psychogenic seizures and of other psychiatric conditions are deemed stable, surgery may not be necessary if epileptic seizures are adequately controlled with anti-epileptic drugs.[14]

In a second scenario, epilepsy can be truly refractory to medical management and NEPS play a minor role in the clinical picture. In these cases, it is important that both patients and relatives be informed of the diagnoses and be educated to differentiate both seizure types. The patient should not be denied surgery, especially because uncontrolled seizures have a deleterious role on the mental well being of the patient. It is important, though, that all patients in this situation undergo psychiatric evaluation and that all psychiatric issues are appropriately dealt with before surgery. Once psychiatric conditions are deemed stable and patient and family are adequately educated, surgery can be undertaken.

## LONGTERM POST-OPERATIVE FOLLOW-UP

There is a paucity of information in the literature regarding postoperative follow-up of patients with co-existing epileptic and nonepileptic seizures. The occurrence of nonepileptic seizures probably does not unfavorably influence longterm surgical prognosis. The nature of postoperative events can be difficult to establish, especially if events occur rarely. The use of ancillary diagnostic tests in the postoperative setting can be limited. Postoperative EEG exams may show epileptiform abnormalities even in patients with adequate seizure control, and may not be helpful in establishing a correct diagnosis of the type of event in this scenario. MRI also provides little additional information in this setting. Prolonged video-EEG monitoring may not be helpful if events occur infrequently. Abrupt antiepileptic drug withdrawal or tapering for the purpose of recording seizures during video-EEG monitoring should be performed with caution, since this may bring out seizures even in patients who are rendered seizure-free after surgery.

Occurrence of nonepileptic seizures after successful epilepsy surgery has long been recognized. It is not clear in these cases if nonepileptic seizures were already present before surgery (and diagnosis was missed) or if it represents a *de novo* occurrence after epilepsy surgery. This data underscores the importance of a correct diagnosis and optima1 preoperative management of both conditions.[12,13]

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