Paroxysmal alien hand syndrome (AHS) has been reported in association with ictal phenomena, but simultaneous electroencephalographic verification has not been made.

**Observation:** A 61-year-old woman with a right hemisphere glioblastoma multiforme developed movements of the left hand that she claimed were not under her control, and she denied ownership of the affected limb. Simultaneous electroencephalograms documented continuous spikes in the right frontotemporal region. Intravenous diazepam therapy (2.5 mg) reversed both the abnormal movements and the spike activity on the electroencephalograms.

**Conclusions:** Our case demonstrates that partial seizures can produce AHS along with asomatognosia. This variety of AHS appears to be different, both etiologically and phenomenologically, from other forms of AHS.

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The alien hand syndrome (AHS) describes a condition wherein a patient’s hand performs seemingly purposeful actions that are subjectively experienced as unwanted and beyond the patient’s voluntary control. Actions of the alien hand are frequently at cross purposes to the patient’s verbally stated intention. Various subtypes of the AHS have been described. A frontal form is associated with a medial collosal lesion and manifests as repetitive grasping and groping of the limb contralateral to the brain lesion, as well as intermanual conflict in some cases. This form has been interpreted as related to frontal release behaviors and found to occur more commonly, but not exclusively, in the dominant hand. Another form has been associated with lesions restricted to the corpus callosum and is characterized primarily by oppositional behaviors and intermanual conflict of the limb, without abnormal grasping or groping behaviors. When lesions are confined to the corpus callosum, the alien hand has been reported to occur in the nondominant limb.

Leiguarda et al described 4 patients who developed what they termed paroxysmal AHS characterized by complex nonvolitional movements and feelings of estrangement from the limb. Although seizures were suspected as a cause of this syndrome, simultaneous electroencephalographic (EEG) recordings were not available. We recently had the opportunity to examine a patient who presented with status epilepticus and developed autonomous semipurposeful movements of the left arm, which she experienced as alien to her volition, in association with asomatognosia (denial or nonrecognition of a limb). Our case clarifies the relationship between abnormal epileptiform activity, asomatognosia, and AHS.

**REPORT OF A CASE**

A 61-year-old woman, 1 month after surgery for a right hemisphere glioblastoma multiforme, was admitted to the intensive care unit for new-onset seizures involving the entire left side, without loss of consciousness. The patient was taking phenytoin sodium and dexamethasone (Decadron) at the time of admission. A magnetic resonance imaging scan with contrast revealed an enhancing right frontotemporal lobe lesion surrounded by a large area of white matter edema (Figure 1). When the scan was compared with one obtained 1 week before the onset of seizures, the edema was judged to have increased in size.
On interview, the patient stated, “I can’t control this arm [her left arm] . . . it just does what it wants to do.” She referred to her left hand as being “not my own” and said that it “belonged to someone else.” She also reported paresthesias of the left leg. She was observed to have a focal motor seizure of the left side, including head turning, followed by a secondary, generalized tonic-clonic seizure.

On examination, she demonstrated grasping, picking, and semipurposeful movements of the left hand. When placed on the bed, the left hand picked at the patient’s clothes, lifted her hospital gown, and was in near constant motion. When placed in the air, the left hand made wandering, partial grasping, and complex pincher-like movements. The patient referred to her left leg as “a board” and to her left arm as “a buddy . . . a nickname I gave to the figure that was attached to me.”

During the course of the EEG tracing, on nearly all trials, she correctly identified both the examiner’s hand and her right hand but almost always misidentified her left hand as “your hand” (the examiner’s hand). As demonstrated in Figure 2, left, simultaneous EEG recordings revealed underlying, continuous, polymorphic delta activity in the right hemisphere, maximal in the right temporal region. More importantly, there were continuous spikes in the right frontotemporal region, maximal in the midtemporal area, with spread to parietal leads, strongly suggestive of an ictal pattern.

The patient received diazepam (2.5 mg intravenously), and the automatic movements ceased immediately. The hand was able to lie still on the bed and began making fully nonalien, purposeful movements. The EEG recording revealed focal slowing, maximal in the right temporal region, but there was nearly complete resolution of the ictal/spike activity (Figure 2, right). Subsequent examinations after resolution of status epilepticus failed to show abnormal or involuntary movements or asomatognosia. A follow-up EEG showed slowing and occasional sharp waves, without evidence of status epilepticus.
COMMENT

Two of the 4 cases of “paroxysmal alien hand” described by Leiguarda and coworkers displayed grasping and groping movements of the limb contralateral to the brain lesion, most typical of the frontal form of AHS. The other 2 had parietal lesions and a loss of feeling of ownership of the limb (asomatognosia). Our case, with EEG confirmation of ictal activity, demonstrates that feelings of limb estrangement and semipurposeful movements can occur as a manifestation of partial seizures, confirming the suggestions of Leiguarda and colleagues that their patients’ disturbance represented a seizure phenomenon.

Alien hand syndrome has at least 2 essential components: the dissociation of intention and the presence of semipurposeful or pseudovolitional movement. Also, some patients have also shown nonrecognition of the limb. For instance, the patient of Brion and Jedynak with “la main étrangère” could not accomplish tactile identification of the hand when it was held behind the patient’s back. Some patients with “alien hand sign” due to corticobasal ganglionic degeneration or posterior infarcts have been reported to show some misidentification of the limb as well.

While all patients with AHS experience the actions of the hand as foreign, most patients with AHS due to frontal or collosal lesions have not been reported to deny ownership of the limb per se. However, paroxysmal asomatognosia is known to occur as a result of focal seizures. In 1931, Guttmann described a patient with a right parietal head injury who developed a generalized seizure preceded by “a feeling as if his left hand did not belong to him any longer . . . that this hand was completely foreign and belonged to another person.” Guttmann attributed the alteration in attitude toward the left hand to an epileptic focus in the parietal region. More recently, Salanova et al reported disturbances of body image, which included feelings of limb alienation, in 11% of patients with surgically confirmed parietal lobe epilepsy.

Tonic postural changes and upper limb automatisms also occur from epileptic discharges originating in the parietal lobe. The combination of complex movements coupled with paroxysmal asomatognosia, both generated by a parietal lobe seizure, could explain why the involuntary actions of the arm could be experienced by the patient as particularly foreign or alien.

Our patient, however, had a right frontotemporal lesion on magnetic resonance imaging scans and an EEG that demonstrated ictal activity maximally in the frontotemporal region, with spread to parietal leads. It is possible that although the lesion and seizure focus were frontotemporal, ictal spread to parietal lobe accounted for the clinical picture in our patient. Thus, combined frontal and parietal dysfunction could result in the paroxysmal cooccurrence of upper limb automatisms and asomatognosia, causing our patient to disavow the movements of the arm.

Alternatively, the AHS in our patient could be a result of frontal lobe seizures alone. However, asomatognosia, especially when it occurs in the context of seizures, has been reported predominantly in association with parietal foci. Thus, we think it possible that parietal lobe impairment is also involved in our case.

In conclusion, our case confirms the ictal nature of the paroxysmal alien hand, but we cannot determine its exact anatomical locus. It also appears to have a mechanism that is distinct from other forms of AHS.

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REFERENCES

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Correction

Error in Title. In the article titled “Partial Status Epilepticus Associated With Asomatognosia and Private Alien Hand–Like Behaviors” by Feinberg et al published in the December issue of the Archives (1998;55:1574-1576), the word “Private” should not have been in the title, which should have read “Partial Status Epilepticus Associated With Aomatognosia and Alien Hand–Like Behaviors.”