

# Postictal behaviour in temporal lobe epilepsy

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**ABSTRACT** – Postictal phenomena such as nose-wiping, coughing and hypersalivation are believed to reflect a purposeful reaction to hypersecretion after regaining consciousness following a complex partial seizure, and are very common in patients with temporal lobe epilepsy, particularly in mesial temporal lobe epilepsy. Nose-wiping is usually performed with the hand ipsilateral to the side of seizure onset. Our patient illustrates an unusual, exaggerated postictal behaviour consisting of long-lasting nose-wiping, coughing and guttural sounds following a complex partial seizure due to right mesial temporal lobe epilepsy.

*[Published with video sequences]*

**Key words:** postictal nose-wiping, postictal coughing, mesial temporal lobe epilepsy, hypersecretion

Postictal phenomena such as nose-wiping, coughing and hypersalivation have been shown to be much more common in patients with temporal lobe epilepsy, especially those with a mesial temporal onset, than in extratemporal epilepsies (Leutmezer *et al.* 1998, Catenoix *et al.* 2004, Hirsch *et al.* 1998). Nose-wiping and coughing are believed to reflect a purposeful reaction to hypersecretion after regaining consciousness following a complex partial seizure. The case presented here shows postictal, long-lasting nose-wiping, coughing and guttural sounds indicating significant hypersecretion in a patient with right mesial temporal lobe epilepsy.

started one year later, when he had three episodes of falling down, apparently without any movement, followed by somnolence. He was admitted to the intensive care unit, but it is not clear whether he suffered *status epilepticus*. Treatment with phenobarbital was started and the patient had no more seizures until experiencing a similar seizure during sleep one year later. From this moment on, the patient has continued to suffer from his present seizures consisting of unresponsiveness and turning of the head to the right lasting for about 1.5-2 minutes, followed by confusion for another 10 minutes. The family reported guttural sounds as a typical aspect of the seizures. Sometimes seizures appeared during sleep, but most occurred during the awake state, causing the patient to fall down when standing. Seizures were occasionally preceded by a prickling sensation in the head. Seizure frequency at the time of evaluation was a cluster of 7-8 seizures on the same day, once a month.



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## Case report

We describe a 34-year-old, right-handed male admitted to our hospital for surgical evaluation of intractable epilepsy. He had had no perinatal complications. At age 3, he suffered from meningoencephalitis. Seizures

At the time of admission for video-EEG monitoring, the patient was being treated with carbamazepine, phenytoin and levetiracetam. After withdrawal of levetiracetam and reduction of carbamazepine, he experienced six complex partial seizures. Seizures consisted of head and eye deviation to the right and lip-smacking, followed by a motionless period of up to 50 seconds, and at the end of two seizures, elevation of the left leg and bilateral leg movements. In two seizures, a dystonic posturing of the left hand was observed. The postictal phase was characterised by gestures indicating significant hypersecretion, with

nose-wiping (with either one hand or the other, or both hands, although mainly with the right hand), eye-wiping, coughing, snuffling, guttural sounds and flatulence which lasted for 10-15 minutes. During this period the patient remained confuse and could not communicate, although no clear signs of aphasia were observed.

Seizure onset on the surface EEG recording consisted of rhythmic delta activity over the right temporal area, which was always present several seconds before clinical onset (*figure 1A*). After approximately 10 seconds, this activity spread in all seizures to the other hemisphere, with left



**Figure 1.** Electroencephalographic changes during the complex partial seizure, showing rhythmic delta activity with increasing frequency in the right temporal area (box cursor) at seizure onset (A). After spread to the left hemisphere a left fronto-temporal predominance was observed during the remaining part of the seizure (B).

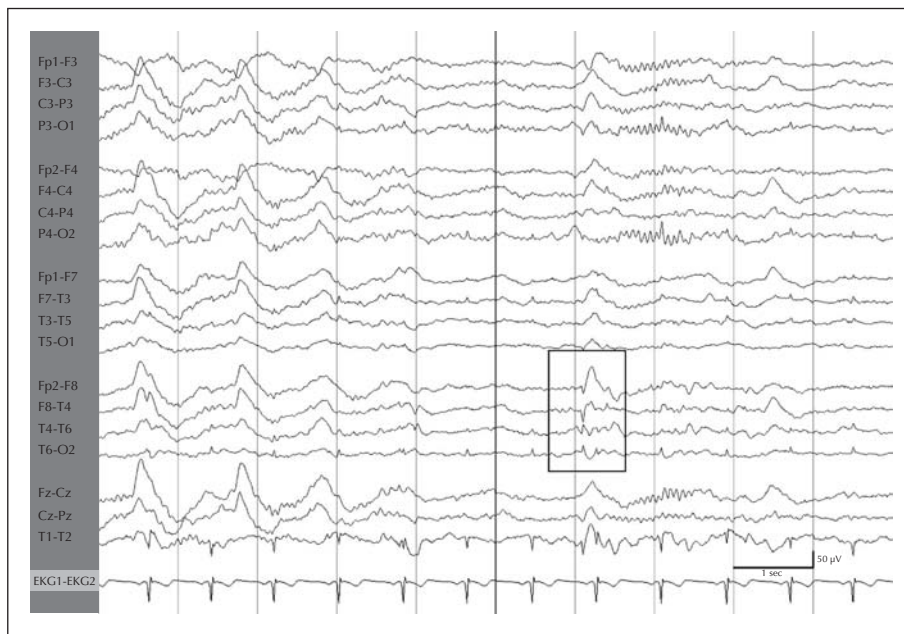
fronto-temporal predominance during the remaining part of the seizure (*figure 1B*). During the postictal phase, diffuse delta slowing was observed.

Interictal epileptiform discharges were confined to the right temporal area (*figure 2*). The MRI scan (*figure 3*) showed a right mesial temporal sclerosis.

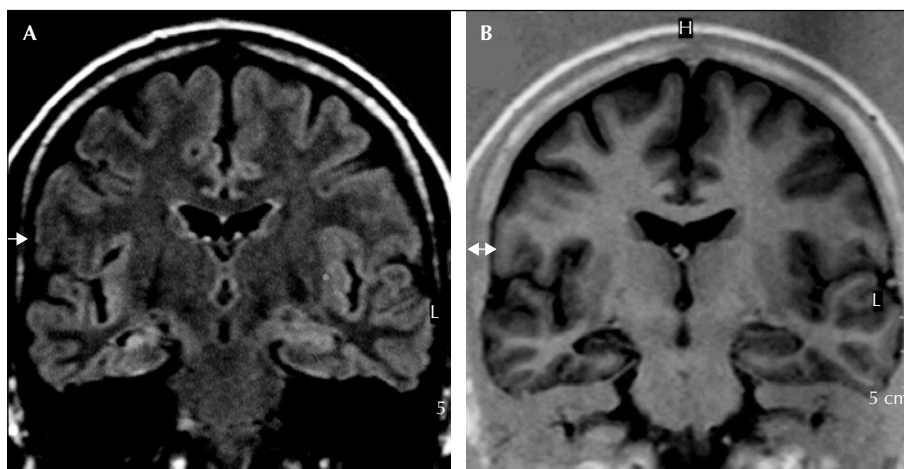
The patient is at present awaiting surgery, which will involve a right temporal lobectomy with amygdala-hippocampectomy.

## Discussion

Ictal hypersecretion of the upper airways is the most probable cause of postictal nose-wiping and coughing (Leutmezer *et al.* 1998, Catenio *et al.* 2004, Hirsch *et al.* 1998). It has been shown by intracerebral recordings that during complex partial seizures, an early activation of the amygdala could play an important role in producing the hypersecretion (Catenio *et al.* 2004) as part of an ictal



**Figure 2.** Interictal epileptiform activity in the right temporal area (spike with phase reversal at T4) during sleep. Spikes and sharp waves in this area were observed at low to moderate frequency.



**Figure 3.** Magnetic resonance tomography of the patient showing signs of mesial temporal sclerosis (T1-weighted coronal slice (A) and coronal inversion recovery (B)). Note the reduced hippocampal volume and alteration of the signal intensity.

autonomic nervous system activation. It is also possible that nose-wiping is due to ictal olfactory hallucinations, but the coexistence of gestures such as nose-wiping and coughing in many patients, sometimes combined with eye-wiping and snuffling as occurs in our patient, suggests a generalised hypersecretion of the upper airways.

Nose-wiping has been described in a high percentage of patients with temporal lobe epilepsy (51-60%), and is much less common in extratemporal epilepsies (Hirsch *et al.* 1998, Leutmezer *et al.* 1998). Among the partial epilepsies of temporal origin, mesial temporal lobe epilepsy – as in our case – shows the highest percentage of patients (65-67%) exhibiting nose-wiping in at least some of their seizures (Hirsch *et al.* 1998, Catenox *et al.* 2004).

Nose-wiping is usually performed with the hand ipsilateral to the side of seizure onset. Hirsch *et al.* found a predictive value of 92% for lateralisation. The predominance of the hand used is not related to the handedness of the patient (Leutmezer *et al.* 1998). It may be explained by a discrete residual weakness on the side contralateral to seizure onset. Interestingly, Hirsch *et al.* found that their patients with false lateralisation showed a bi-temporal involvement in most of their seizures, although this was not true for all patients with contralateral nose-wiping. The authors postulate that if contralateral weakness is due to some sort of exhaustion of neurons involved in motor function, false lateralisation may occur after seizures with prominent contralateral spread or after seizures without ictal contralateral posturing or immobility. Our patient indeed showed a rapid spread to the left temporal lobe, and in the two seizures where contralateral posturing was observed, the patient performed postictal nose-wiping initially with the right hand after cessation of seizure activity. After the seizure shown in the video clip, the patient uses predominantly his left hand for nose- and eye-wiping, although a dystonic posture of the left hand was observed in this seizure.

Ictal flatulence has been mentioned as possible activation of the autonomic nervous system (Devinsky 2004), although published data dealing with this issue are scarce. The increase of intestinal peristalsis could be due to an increase in the parasympathetic tone or an inhibition of the sympathetic activity (Van Buren 1958).

## Conclusions

The case described shows an unusual, exaggerated, postictal behaviour consisting of long-lasting nose-wiping, coughing and guttural sounds illustrating significant hypersecretion after complex partial seizures in mesial temporal lobe epilepsy. □

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### Legend for video sequence

A typical complex partial seizure and the postictal behaviour of this patient are shown. Electroencephalographic recording showed rhythmic delta activity localised over the right temporal area (see *figure 1A*) before the initial turning of the head to the right. Ictal activity spread after about 10 seconds, to the left hemisphere, with a left fronto-temporal predominance during the remaining part of the seizure (see *figure 1B*). The ictal activity ceased when the patient started to recover in bed, and was followed by a diffuse delta slowing. Afterwards, when fully orientated, the patient could not recall the word that the nurse had asked him to memorise during the seizure.

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