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Ictal eructation: a case report

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ABSTRACT – Gastrointestinal symptoms are considered manifestations of ictal phenomena. Eructations are only rarely described. The present case illustrates eructation as an ictal sign in a patient with symptomatic refractory epilepsy and a left temporal lesion submitted to video-EEG monitoring. The ictal EEG reveals a generalized attenuation of background activity followed by a lateralised right anterior temporal theta rhythmic activity. Eructations take place during the initial generalized ictal EEG changes. The rarity of the ictal eructation is emphasised, and the potential localizing and lateralizing value are discussed in the present case. *[Published with video sequences]*

Key words: eructation, ictal semiology, gastrointestinal symptoms

Gastrointestinal symptoms can be present as ictal semiology. Epigastric pain, nausea, retching, vomiting, spitting have been reported as epileptic symptoms, particularly, in temporal lobe epilepsy (Baumgartner *et al.* 2001, Van Buren 1963). However, eructations are rarely described (Cole 1984). The present case illustrates eructation as an ictal sign and discusses its potential localizing and lateralizing value.

Case report

A 34-year-old, right-handed male patient, with a high school level of education and no known musical interests or skills, developed epilepsy after an encephalitic syndrome at 13 years old, which led to hospital admission. He had focal seizures followed by impairment of consciousness and, rarely, secondary generalization was reported. The patient described two distinct types of focal seizures: 1) paraesthesia in the proximal region of the left upper limb with distal progression and ipsilateral hand automatisms, 2) complex auditory hallucinations in the form of listening music. Seizures were refractory in spite of multiple antiepileptic drug regimens, thus the patient was included in the local epilepsy surgery program.

On neurological examination, only a minor slowness of thought and dysphasia were evident. Formal neuropsychological evaluation highlighted a dominant hemisphere dysfunction, comprising non-fluent speech with sporadic anomic pauses and mild defects in verbal function with errors in auditory comprehension and verbal short-term memory.

Successive MRI brain scans disclosed a cortical thickening on left collateral sulcus extending to the ipsilateral fusiforme gyrus, which was non-

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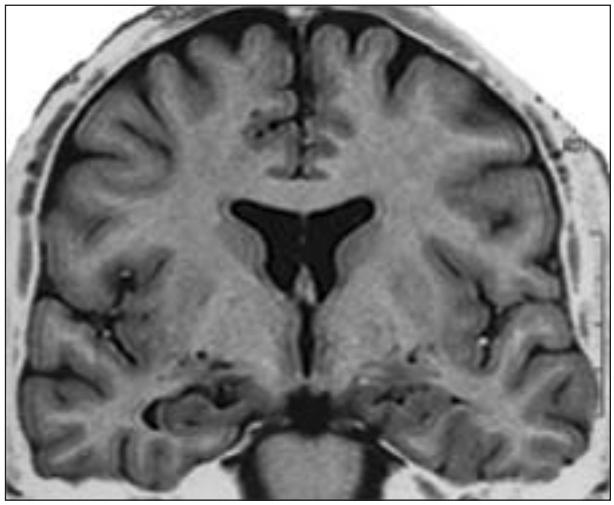

Figure 1. Inverted T2-weighted brain MRI. Cortical thickening on left collateral sulcus and ipsilateral fusiforme gyrus is documented.

progressive in nature *(figure 1)*. The interictal EEG documented bilateral independent spike and sharp wave activity in both anterior temporal (F8, F7), and subtemporal (F10, FT10, T10 and F9, FT9 e T9) electrodes. The inter-ictal ^{99m}Tc-ECD-SPECT and ^{18}F-FDGPET scans did not documented any significant changes. It was not possible to obtain an ictal SPECT.

During video-EEG monitoring, three electro-clinical seizures were documented. In one of the episodes, the patient began having a left head deviation, followed by bilateral hand automatisms and two episodes of eructation. Afterwards, the patient successively presented bilateral, lower limb automatisms, asymmetric tonic limb posturing with left arm extension while maintaining a forced head deviation to the left, together with extension of the neck. Generalized clonic movements were later observed. As described previously, the patient later reported complex auditory hallucinations in the form of unspecified music at seizure-onset. No further episodes of eructation were recorded during ictal or inter-ictal periods. On the ictal EEG tracing *(figure 2)*, an initial generalized attenuation of background activity lasting 34 s was documented. In the last 10 seconds of this period, two episodes of eructation occurred, 7 seconds apart. Afterwards, theta activity, with increasing amplitude, was recorded in the right frontal and subtemporal electrodes (F8, F10, FT10,T10). The clinical and electroencephalographical pattern described above was reproducible in the remaining seizure episodes.

Discussion

To our best knowledge, this is the second case of eructation documented as an ictal sign (Cole 1964), thus demonstrating its rarity. Gastrointestinal ictal manifestations such as vomiting, retching or spitting have been considered to indicate seizure-onset in the non-dominant temporal lobe (Baumgartner *et al.* 2001, Devinsky et *al.* 1995, Kramer *et al.* 1988). We consider eructation as another

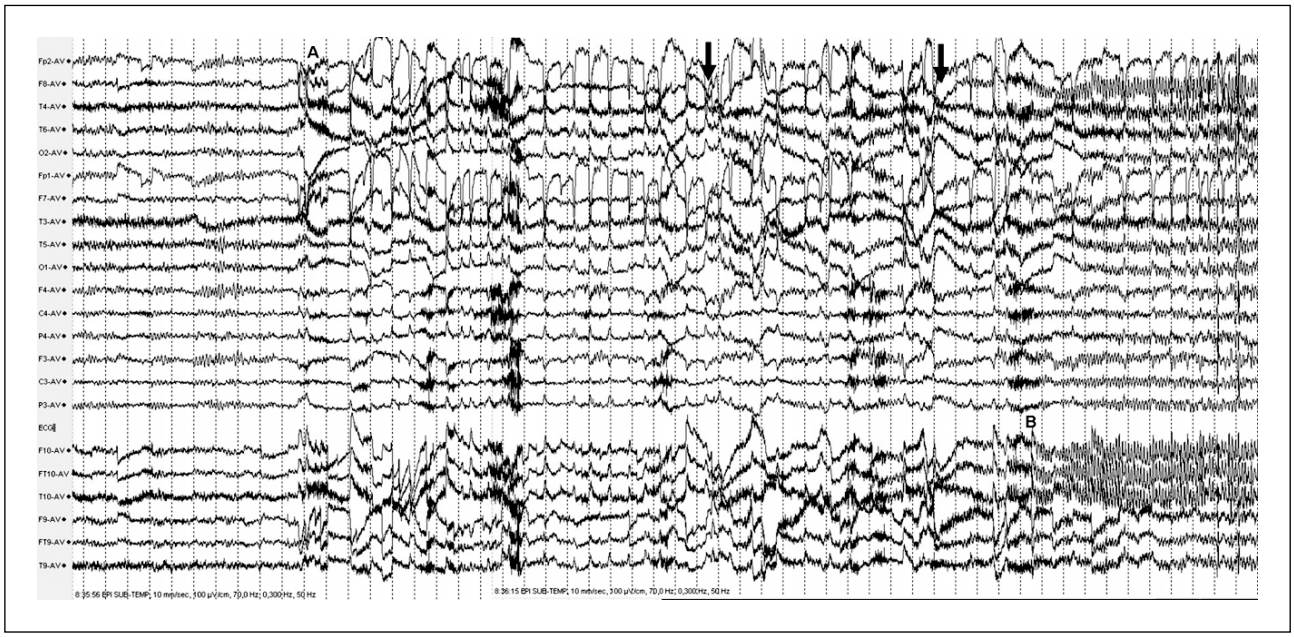

Figure 2. Initial ictal EEG trace of clinical seizure characterized by the occurrence of eructations. A generalized attenuation of background activity (**A**) is followed by a theta rhythmic activity with increasing amplitude in the right frontal and temporal electrodes (F8, F10, FT10, T10) (**B**). Eructations are indicated by vertical arrows.

gastrointestinal motor automatism. The physiological centre for eructation, within the central nervous system, is unknown.

As far as eructations are concerned, the clinical signs observed, *i.e.* forced left head deviation and neck extension, asymmetric limb posturing with left arm extension occurring soon after eructations, favour a right hemispheric location (Loddenkemper and Kotagal 2005). The descriptions of left upper limb paresthesia also favor that location. Regarding the musical hallucinations, published data are inconclusive regarding any lateralizing value (Florindo *et al.* 2006). However, it is also known that music-induced hallucinations are more frequent after right than left temporal stimulation (Penfield and Perot 1963), thus their occurrance does not argue against a right hemispheric location.

Although the initial ictal onset zone region cannot be defined because of the electrodecremental nature of seizure-onset, eructations occurred in the last seconds of this activity, just before the beginning of an ictal theta activity in the right frontal temporal region. Thus, a right non-dominant hemispheric symptomatogenic zone may be suggested for the ictal eructation in this clinical case.

Nevertheless, disagreement may be argued between the EEG signs and MRI findings. One must account for the only documented brain lesion being located in the left temporal lobe, which may suggest a homolateral ictal onset zone. Nevertheless, an early contralateral propagation of epileptic activity could be involved. Conversely, in the only other reported case, a generalized paroxysmal 4 Hz activity with greater intensity in the left fronto-temporal area was recorded during the ictal EEG (Cole 1984). Future cases will help to strengthen or disclaim the proposed right hemispheric symptomatogenic zone location. □

Legend for video sequence

Ictal eructation during a video-EEG monitoring (clinical description). The patient begins having a left head deviation, followed by bilateral hand automatisms and two episodes of eructation. Afterwards, the patient presents successively, bilateral lower limb automatisms, asymmetric tonic limb posturing with left arm extension and forced left head deviation. Generalized clonic movements ensue.

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