

SECONDARY BILATERAL SYNCHRONY ASSOCIATED TO A PARASAGITTAL TUMOR

CASE REPORT

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SUMMARY — A 32 years old woman who had postural limbic and primarily generalized tonic-clonic seizures since the age of 11 presented to us with a CT image strongly suggestive of a mesial meningioma near the right cingulum. Her ictal EEG pattern was characterized by regular 1.5-2.0 Hz sharp and slow wave complexes. A right craniotomy was performed under general anesthesia and intraoperative electroencephalographic and electrocorticographic recordings were obtained by means of scalp steel electrodes and modified cerebellar stimulation electrodes, respectively. These recordings demonstrated that surface spikes were often independent from the electrocorticographically recorded ones. Before tumor excision, electrical stimulation of the peritumoral mesial cortex resulted in an increase in the epileptic activity. The stimulation of the cavity left after tumor excision led to a prolonged electrographic seizure and neurophysiological procedures were stopped. Post-operatively, the patient has remained seizure free for 6 months and her EEG was normal. The pre-, intra- and post-operative findings in this case suggest that the gliotic peritumoral mesial cortex was at least involved in the epileptogenic process.

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Sincronia bilateral secundária associada a tumor parassagital: relato de caso.

RESUMO — Uma paciente, com 32 anos de idade, com crises posturais e tônico-clônicas primariamente generalizadas, realizou TC de crânio que sugeria fortemente um meningioma mesial, sobre o cíngulo direito. Seu padrão eletrográfico ictal era caracterizado por complexos de onda aguda e onda lenta associadas na frequência de 1,5-2,0 Hz, difusamente distribuídos. Craniotomia frontal direita foi realizada sob anestesia geral e registros electroencefalográficos e electrocorticográficos foram obtidos por eletrodos de aço subgaleais e eletrodos de estimulação cerebelar modificados. Estas registrações demonstraram que as descargas de superfície associadas com as crises de ausência simples, quando presentes, eram independentes das descargas de superfície. Antes da excisão do tumor, a estimulação elétrica do córtex mesial peritumoral resultou em um aumento da atividade epiléptica. A estimulação da cavidade deixada após a excisão do tumor levou a uma crise prolongada e os procedimentos neurofisiológicos foram interrompidos. Pós-operatório, a paciente permaneceu livre de crises por 6 meses e seu EEG foi normal. Os achados pré-, intra- e pós-operatórios neste caso sugerem que o córtex mesial peritumoral estava envolvido no processo epileptogênico da sincronia bilateral secundária.

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avoiding the spread of the epileptogenic activity to the other hemisphere and lowering the epileptic objective phenomena has also been assessed elsewhere 1,6,9,13,16.

We present a case of a 32 year old woman with a parasagittal tumor and an electrographic pattern of generalized epilepsy, postural limbic seizures and no loss of consciousness who was operated upon with subsequent cessation of her seizures.

CASE REPORT

MB, a 32 years old woman began with seizures at the age of 11. She had infrequent primarily generalized tonic-clonic seizures and some episodes that seemed to be atonic seizures at the beginning of her illness. At the age of 15 she began to have seizures in which she lost contact with the environment. Her facies was a very sad one and sometimes tears could be seen. Her shoulders were somewhat internally rotated and her arms were sustained in flexion in such a position that made the observer think that she would cry. She was unable to speak. No myoclonic movements of the eyelids could be recorded. Numbers, histories or colors shown or told her during the (attack could be reproduced soon after the end of the seizure which was characterized by no post ictal confusion. The entire episode lasted from 10 to 15 seconds. Hyperventilation easily triggered these seizures. She was uncontrolled in respect to her seizures which occurred twice a day despite the use of 1.5 grams of sodium valproate and adequate doses of carbamazepine, phenytoin and primidone. The neurological examination was normal. A CT scan disclosed a right frontal parasagittal hyperdense lesion, suggestive of a meningioma (Fig. 1). Pre-operative EEGs were characterized by a normal background activity with diffuse bursts of sharp and slow wave complexes at a frequency of 2 to 3 Hz, with a higher amplitude over the left hemisphere. During the seizures, regular 1.5 to 2.0 Hz sharp and slow wave complexes were recorded after a train of spikes over the right frontal region (Fig. 2).

This patient underwent a right frontal craniotomy under general anesthesia with intraoperative electroencephalographic and electrocorticographic monitoring. The surface EEG was recorded by means of steel needle electrodes placed subcutaneously over both anterior parasagittal, left temporal and right prefrontal and temporal regions. The electrocorticogram was obtained with two modified cerebellar stimulation electrodes placed over the right

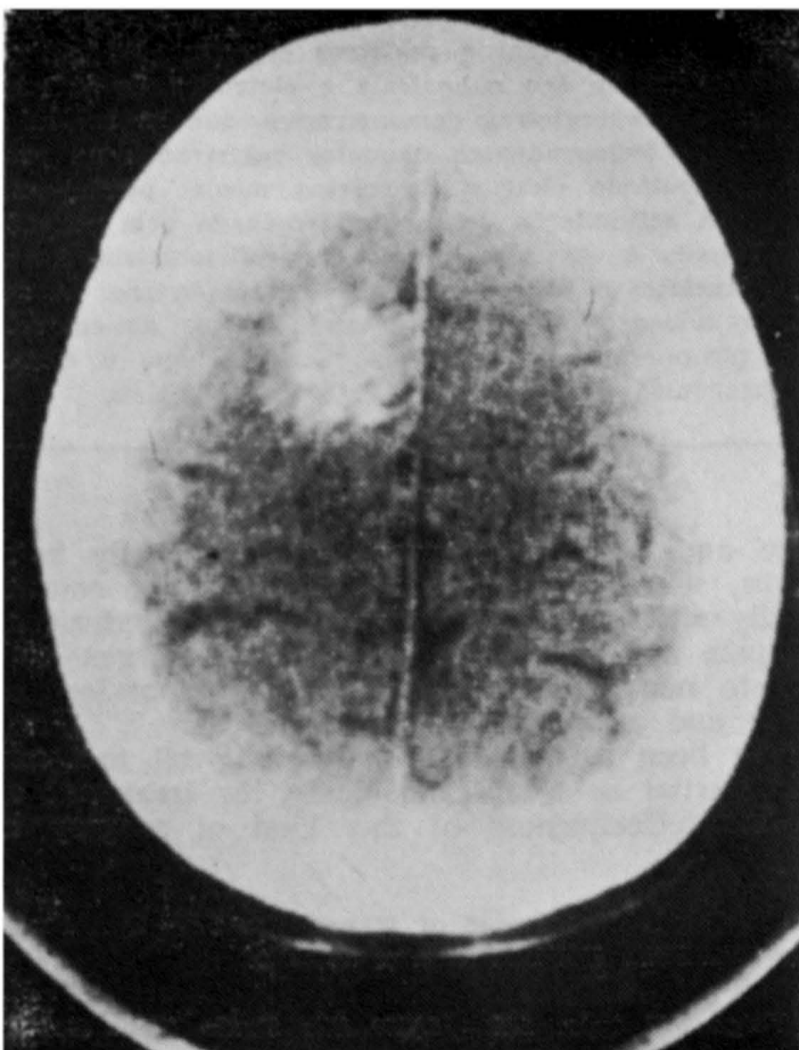


Fig. 1 — The CT scan showing the parasagittal lesion suggestive of a meningioma.

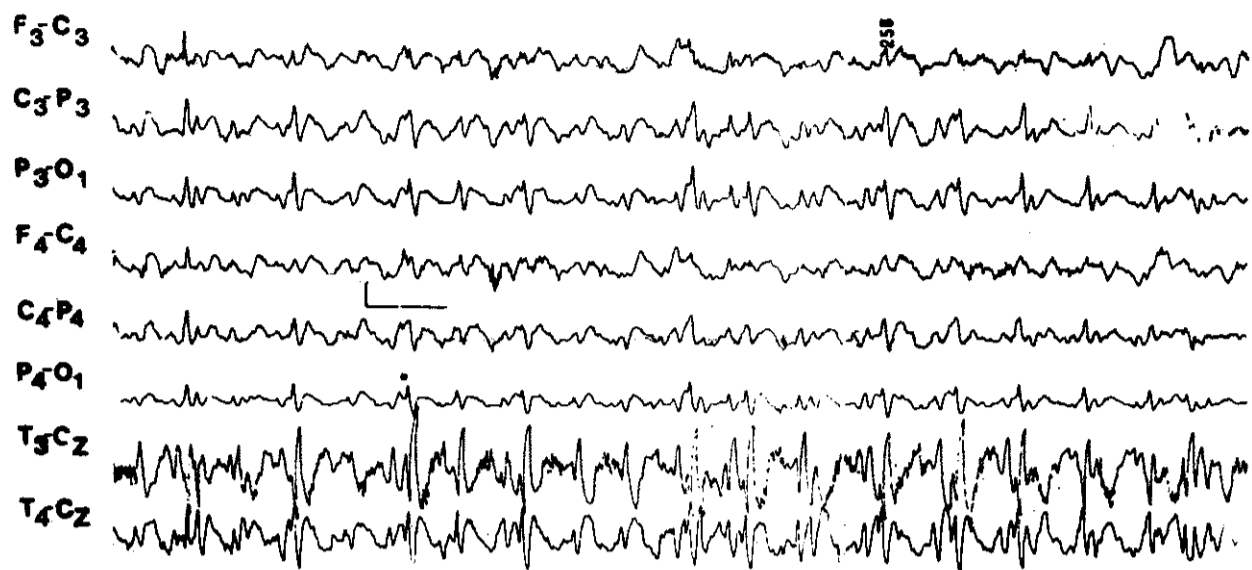


Fig. 2 — Ictal EEG pattern showing a train of spikes over the right frontal region followed by regular bilateral and synchronous 1.5-2.0 Hz sharp and slow wave complexes. Vertical bar = 25 uV; horizontal bar = 1 sec.

mesial region, one over the tumor surface and the other lying on the mesial frontal cortex. Before tumor excision, independent spikes on the surface EEG and electrocorticogram could be seen. Electrical stimulation with pulses with a frequency of 60 Hz, duration of 1 ms and amplitude of 1 Volt was performed for 5 seconds each time by means of the same electrodes described. The stimulation on the tumor surface caused an increase in the number of sharp waves with a latency of 10 seconds. This phenomenon! was very transient. The stimulation of the mesial cortex posterior to the tumor disclosed an increase in that same type of activity without any latency (Fig. 3). Stimulation of the mesial cortex anterior to the tumor, the frontal convexity and the cingulate gyrus did not alter the basal activity. After removal of the tumor there was a clear increase in the amount of irritative discharges which were more diffuse and frequent and characterized by bursts of sharp waves, spikes and polyspikes-slow waves complexes, predominantly over the central areas. Stimulation of the cavity left after the tumor removal, which was covered by intense peritumoral gliosis, gave rise to an electrographic seizure after 30 seconds. Desynchronization of the cerebral activity followed by intense irritative discharges with sharp waves, spikes and polyspikes either associated or not to slow waves was recorded (Fig. 4).

A post-operative CT scan showed a complete removal of the tumor. An EEG performed 5 months later was normal and the patient was seizure free. Two months later, she developed a psychotic episode associated to a cluster of seizures which remitted with standard neuroleptic drugs. One year afterwards she is controlled in relation to her seizures under high dose valproate therapy. Pathological examination of the tumor that was located on the right mesial surface with its lower border over the cingulate gyrus and its superior border 3.5 cm far from the frontal convexity, proved it to be a meningioma.

COMMENTS

The patient was presented to us as having medically intractable «absence» seizures. Valproate, phenytoin, carbamazepine and primidone in adequate doses, in mono- and polytherapy had been tried previously.

GloorS discussed the usefulness of the term consciousness in epilepsy. He was able to gather a few examples of reported seizures with a spike and wave EEG pattern where consciousness was not completely lost. In those cases, aphasia and a motionless behavior were the main points disturbing the contact with the environment. Our patient had no loss of consciousness although she was unable to contact during a seizure due to a sustained tonic posture. The seizures also showed some limbic features characterized by the appearance of a «sad facies» many times including tear drops. The EEG and clinical pictures pointed to a parasagittal focus near limbic structures, particularly the cingulate gyrus where the tumor has later been found 2,4,7,8,10-12,14,15.

Intraoperative electrocorticography confirmed the presence of the parasagittal focus around the tumor and post-operative follow up confirmed the cessation of

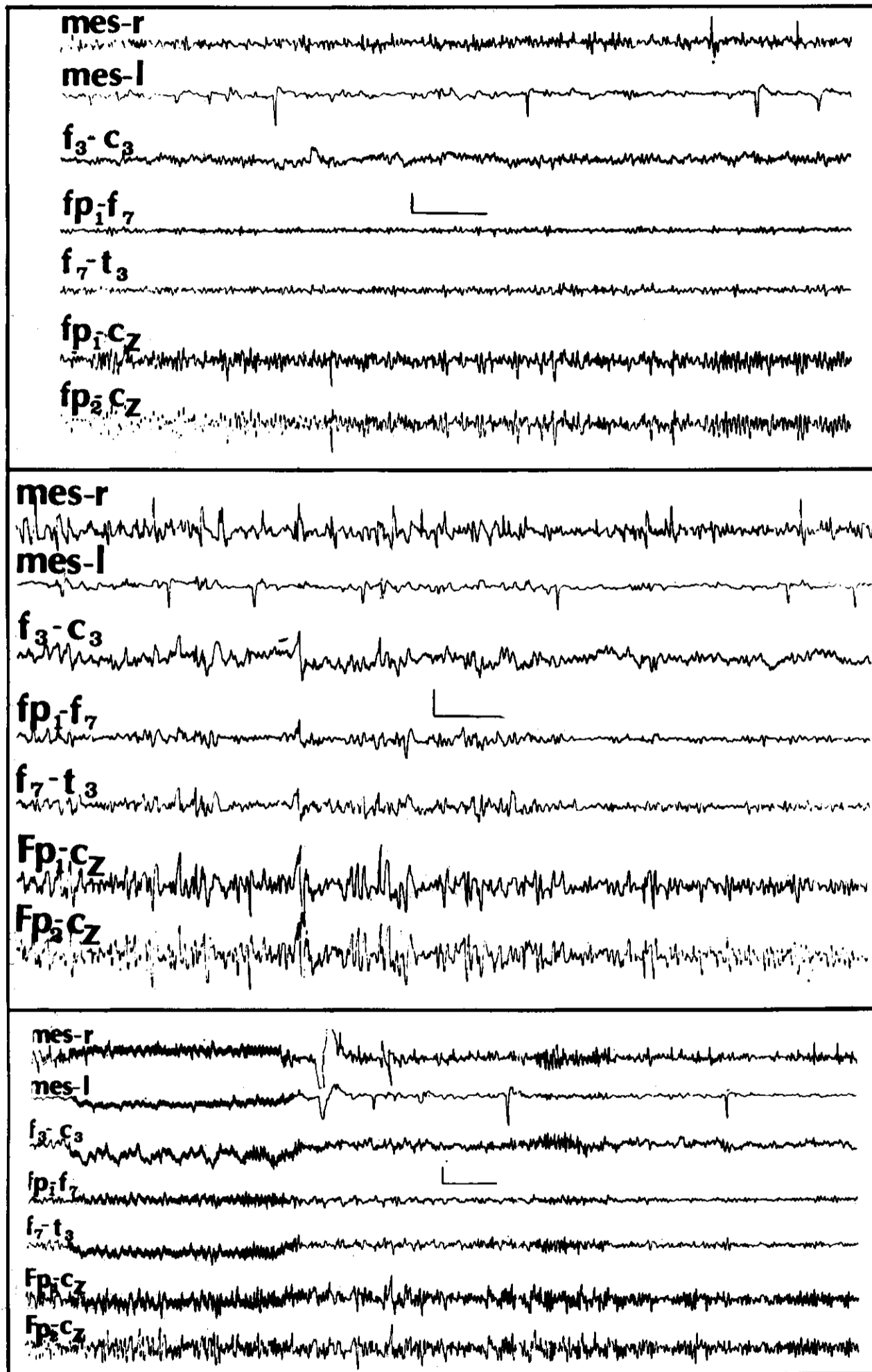


Fig. 3 — Above: pre-stimulus basal recordings showing surface spikes independent from the electrocorticographically recorded ones.
 Middle: pattern of increased irritative activity after stimulation of the tumor with a latency of 10 sec.
 Below: results of stimulation of the mesial cortex posterior to the tumor showing an increase in the number of sharp waves during stimulation.
 Vertical bars = 50 μ V; horizontal bar = 2 sec.

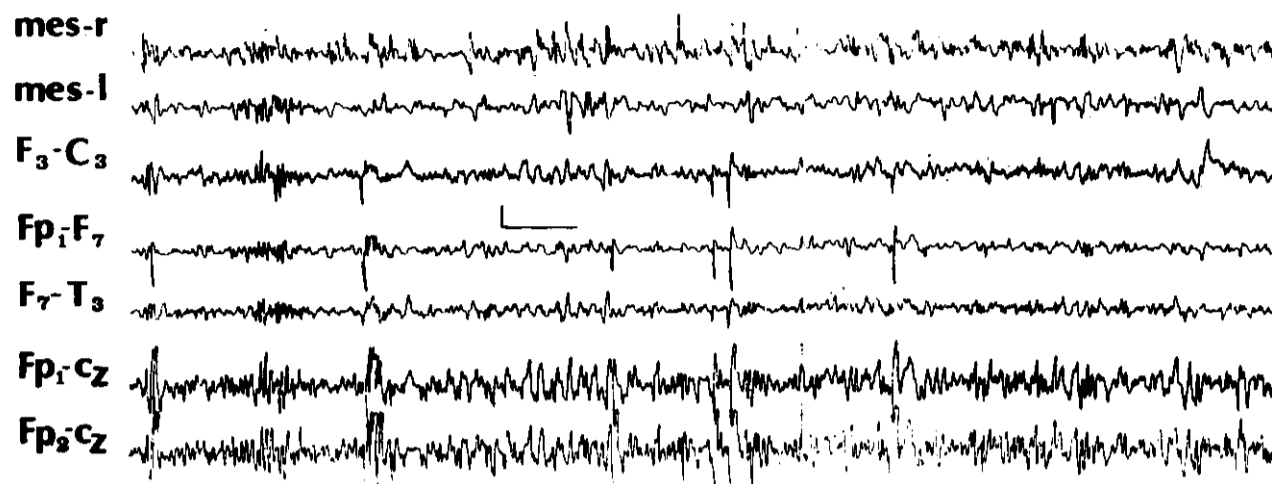


Fig. 4 — Electrographic seizure obtained after stimulation of the cavity left after the removal of the tumor, characterized by sequences of sharp waves, spikes and polyspikes associated or not to slow waves. Vertical bar = 50 uV; horizontal bar = 2 sec.

seizures. Cortical stimulation initiated an electrographic seizure showing that the cingulate region was at least involved in the epileptogenic process.

In summary, we present a case with clinical and electrographic generalized epilepsy patterns where a focal parasagittal lesion has been found. Surgical excision of the abnormal tissue and its surrounding gliosis has led to the disappearance of the seizures. The role of mesial structures in the genesis of secondary bilateral synchronies should be further studied.

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