

ELECTROCLINICAL SYNDROMES: Report of a case

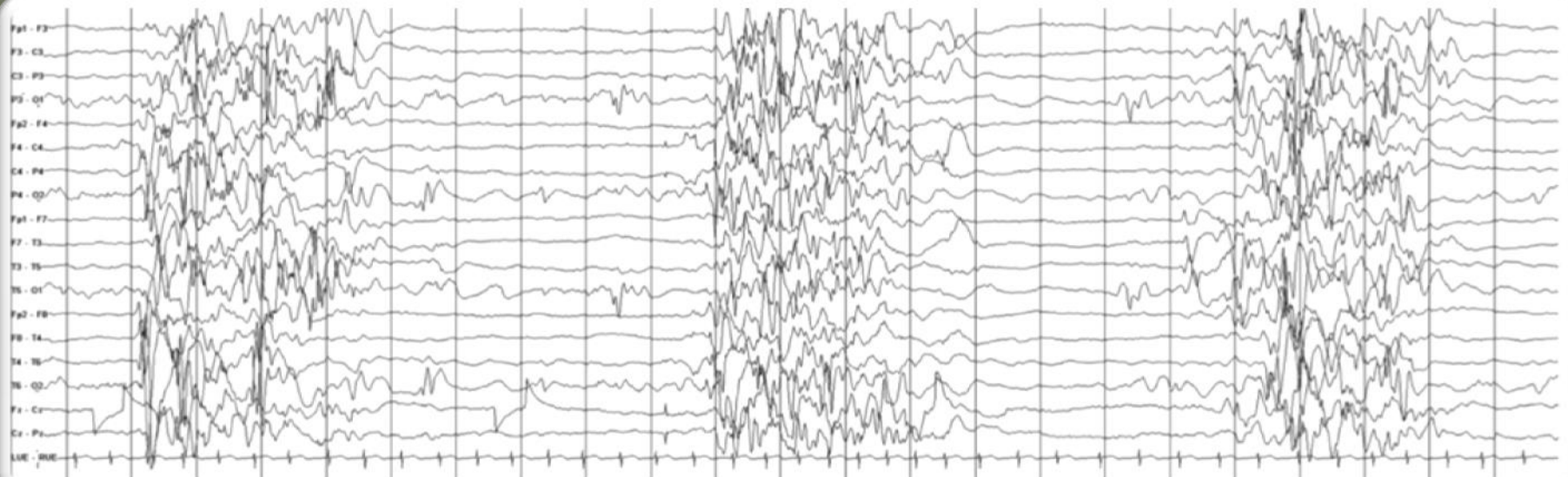
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- **38.1 WGA** Patologic Fetal Doppler + Slight oligohydramnios – Ending pregnancy— caesarean
- Male, Apgar 7 y 8. W 3kg. H: 47cm. CP 33.5cm.
- **A few hours of life he shows:**
 - Febricula (37.5° C)
 - Tachypnea (Sat O₂ 100%)
 - Hypotonia
 - Insufficient suction



NICU



Start antibiotic during 5 days... culture - (Blood / CSF)
IMV cause worsening of respiratory problems

- **40 hours of life:** First epileptic seizure

Extremities Hypertonia

Oxygen desaturation

Clinic-Electric aEEG

Phenobarbital –Partial response.
(120 mg)

- **2 days of life:** Conventional EEG

Frequent electroclinical and subclinical seizures---Hypertonia

Epileptiform activity multifocal and generalized

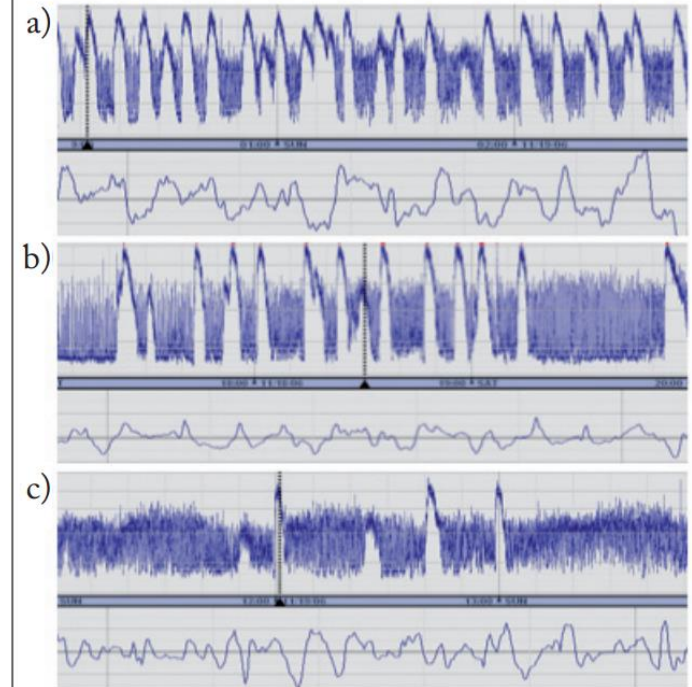
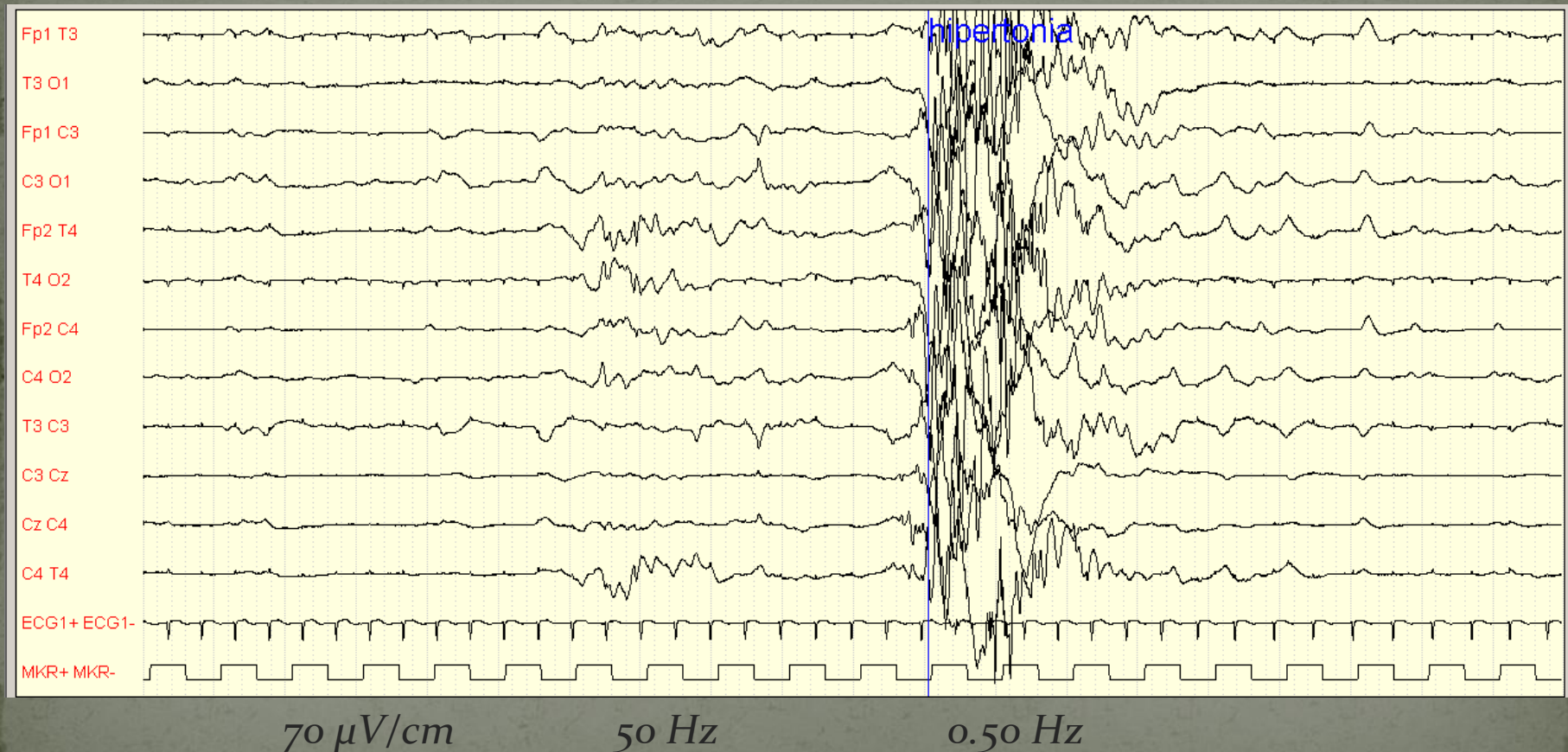


Figura 3. a) Estado epiléptico. b) Crisis repetidas sobre trazado brote-supresión. c) Crisis repetidas en trazado normal.

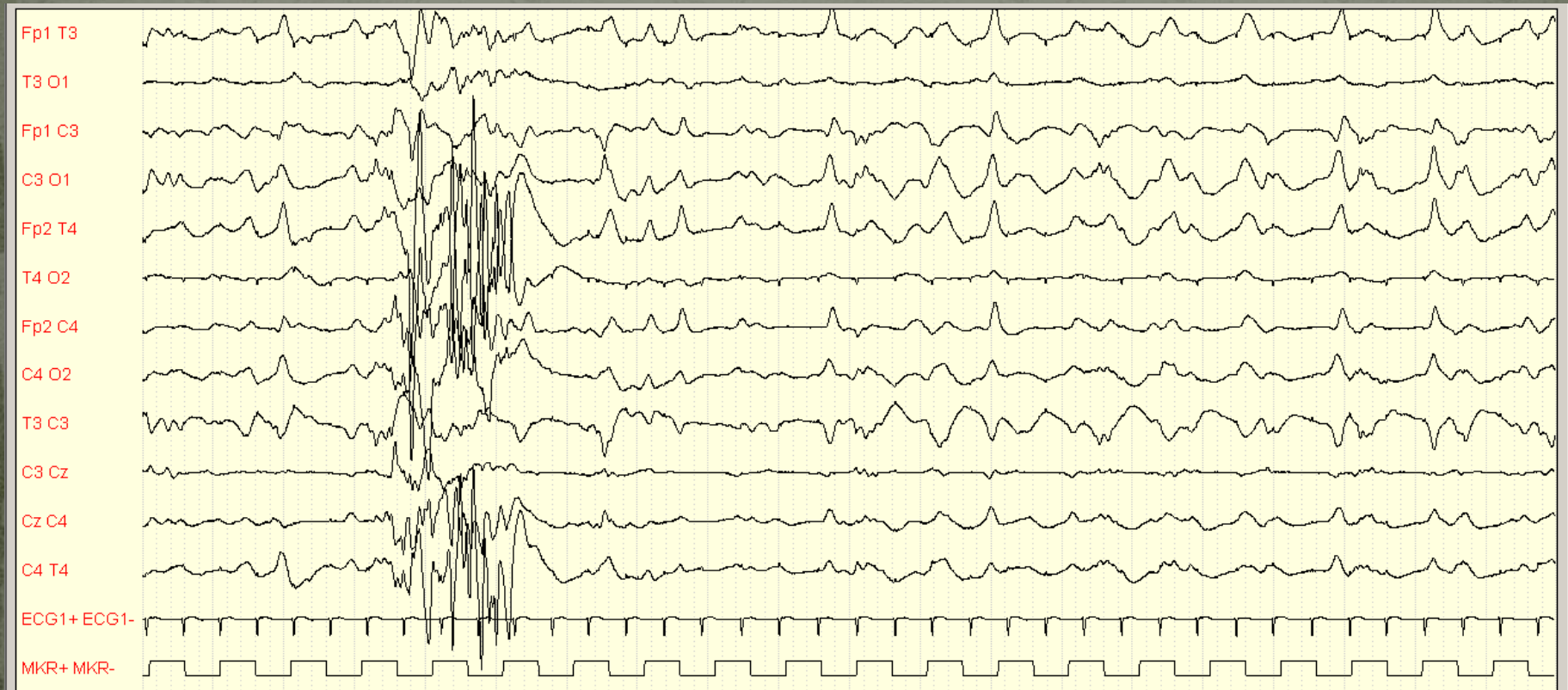
EEG 2 days of life

Phenobarbital 120 mg/7h

- Discontinuous brain activity
- Epileptiform activity multifocal and generalized
- Generalized hypertonia of upper limbs



- Discharge of Sharp waves in the right hemisphere of the brain.



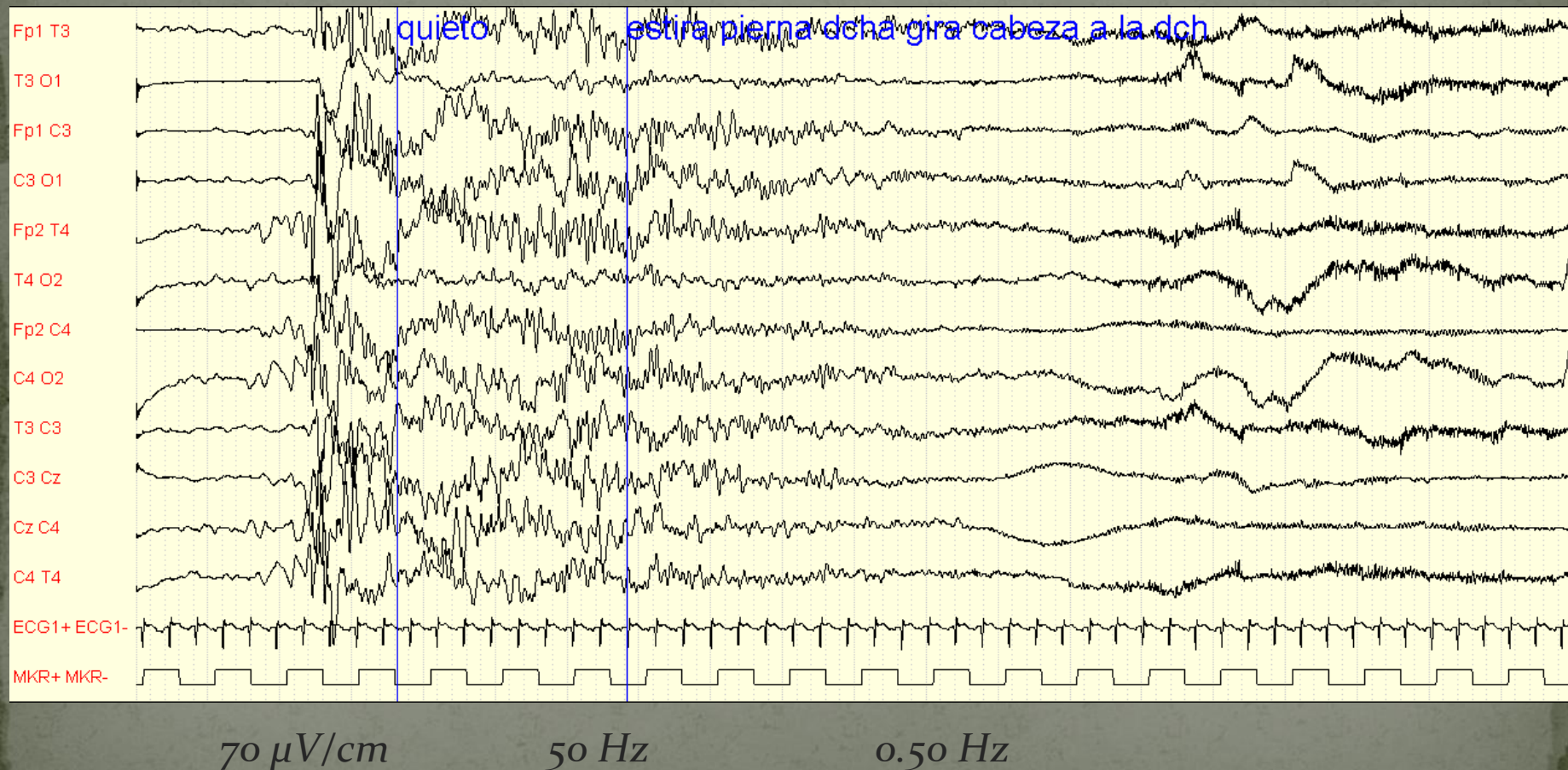
70 $\mu\text{V}/\text{cm}$

50 Hz

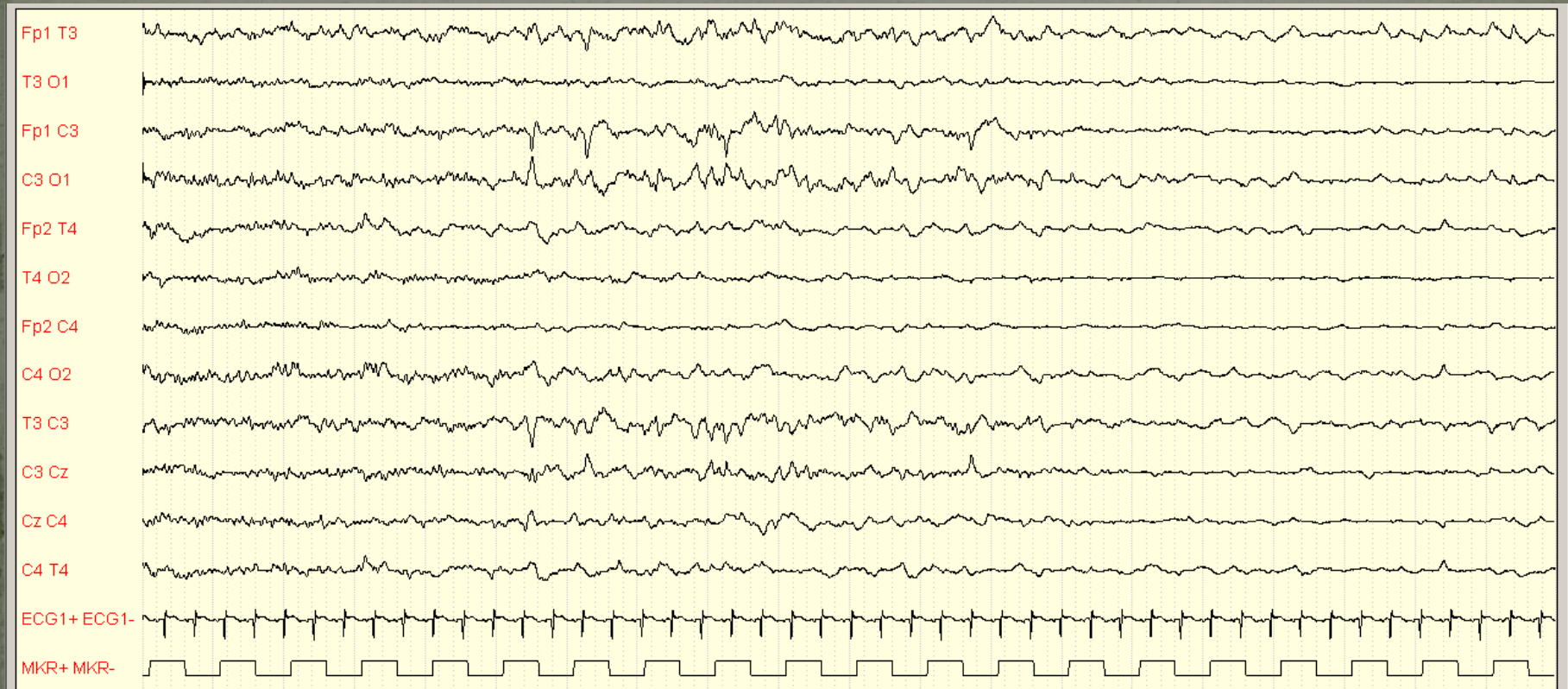
0.50 Hz

EEG 7 days of life phenytoin+ clonazepam, (midazolam 2h before)

- Continue generalized epileptiform activity



- Reduced and slowed basal brain activity
- Epileptiform activity

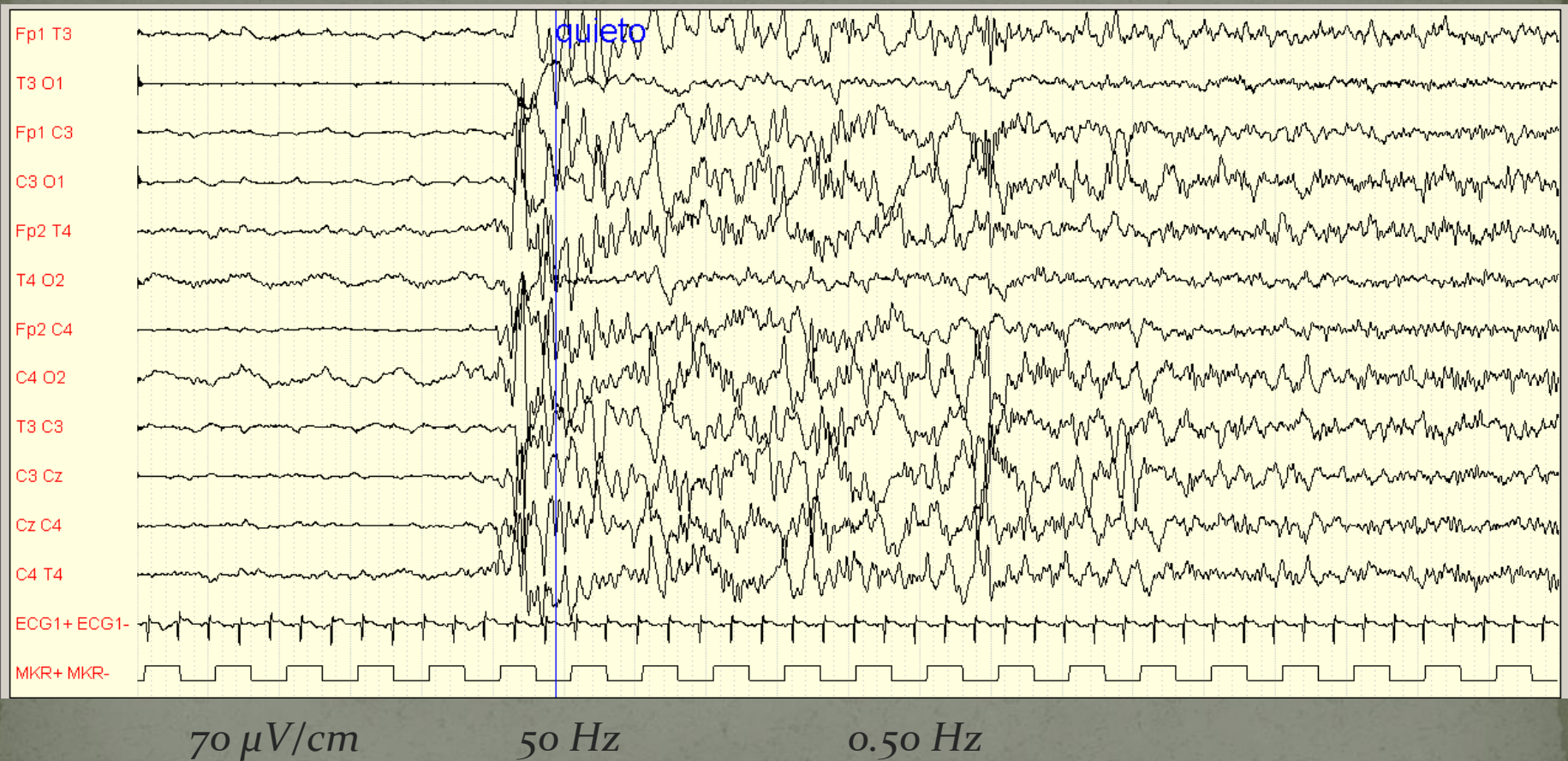


$70 \mu\text{V}/\text{cm}$

50 Hz

0.50 Hz

- Generalized epileptiform discharge.

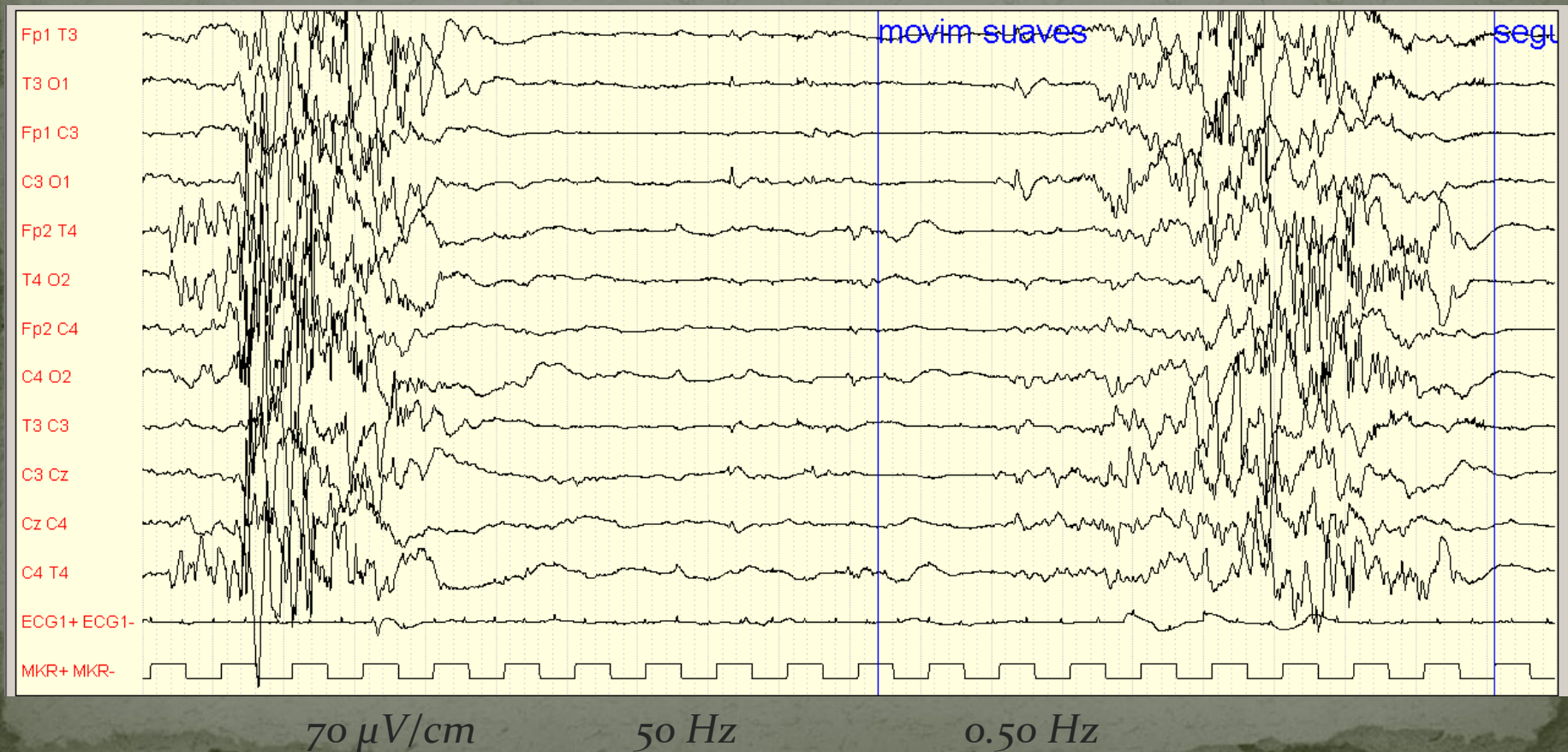


- EEG 14 days of life 3th control EEG (Phenitoin maintenance dose)

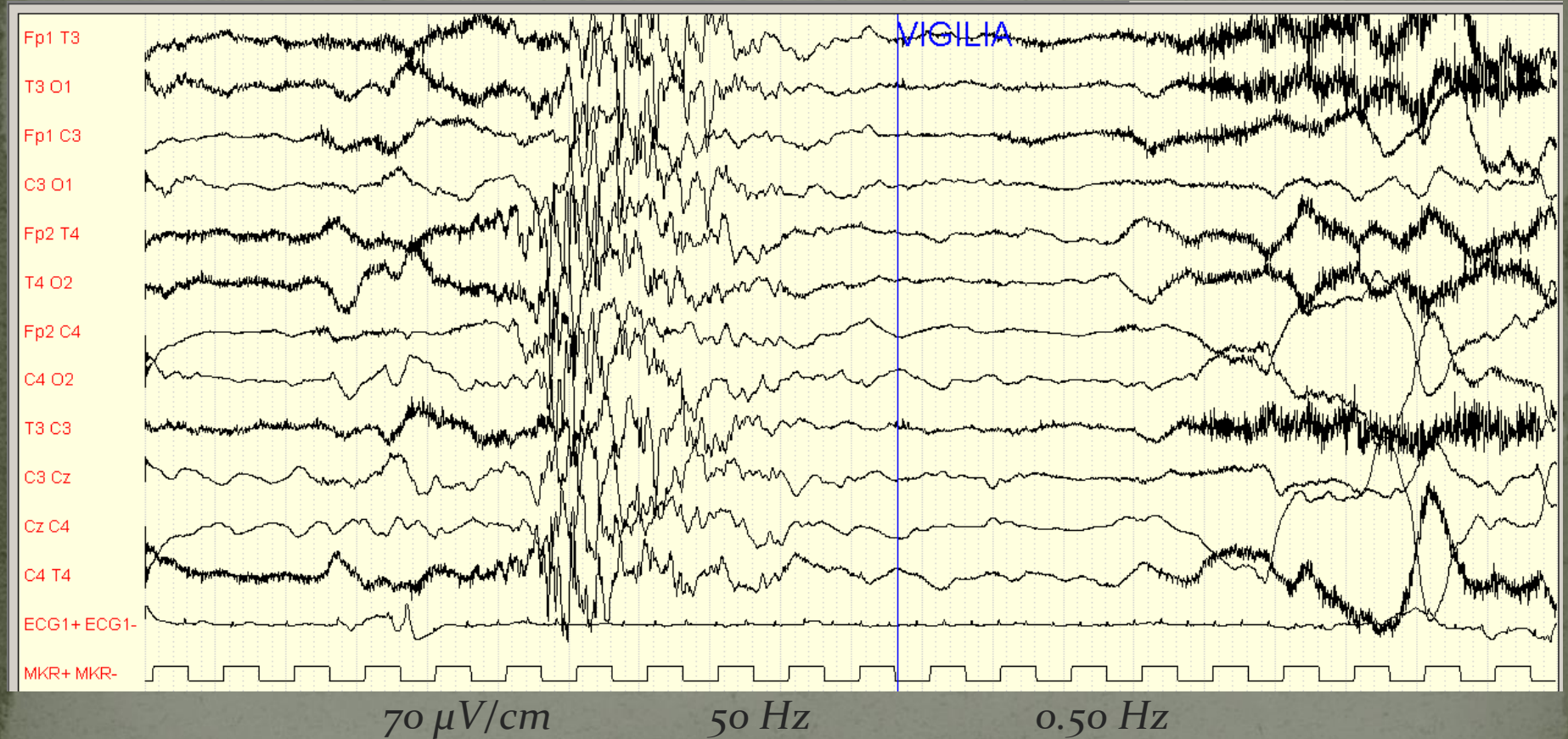
Persistency of clinical and subclinical seizure

Suppression burst pattern

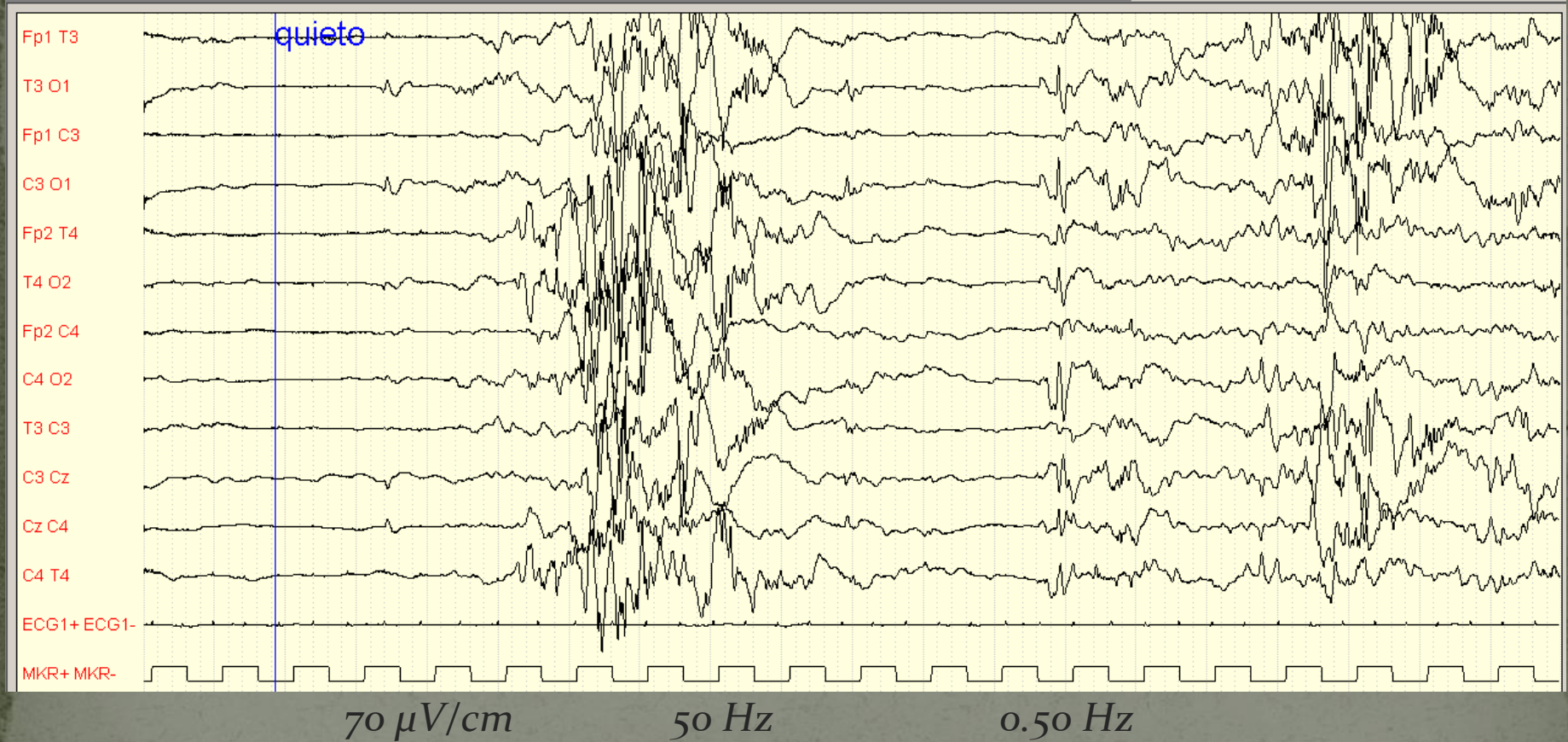
Epileptiform multifocal activity



Suppression burst pattern (wakefulness)



- No Sleep waves

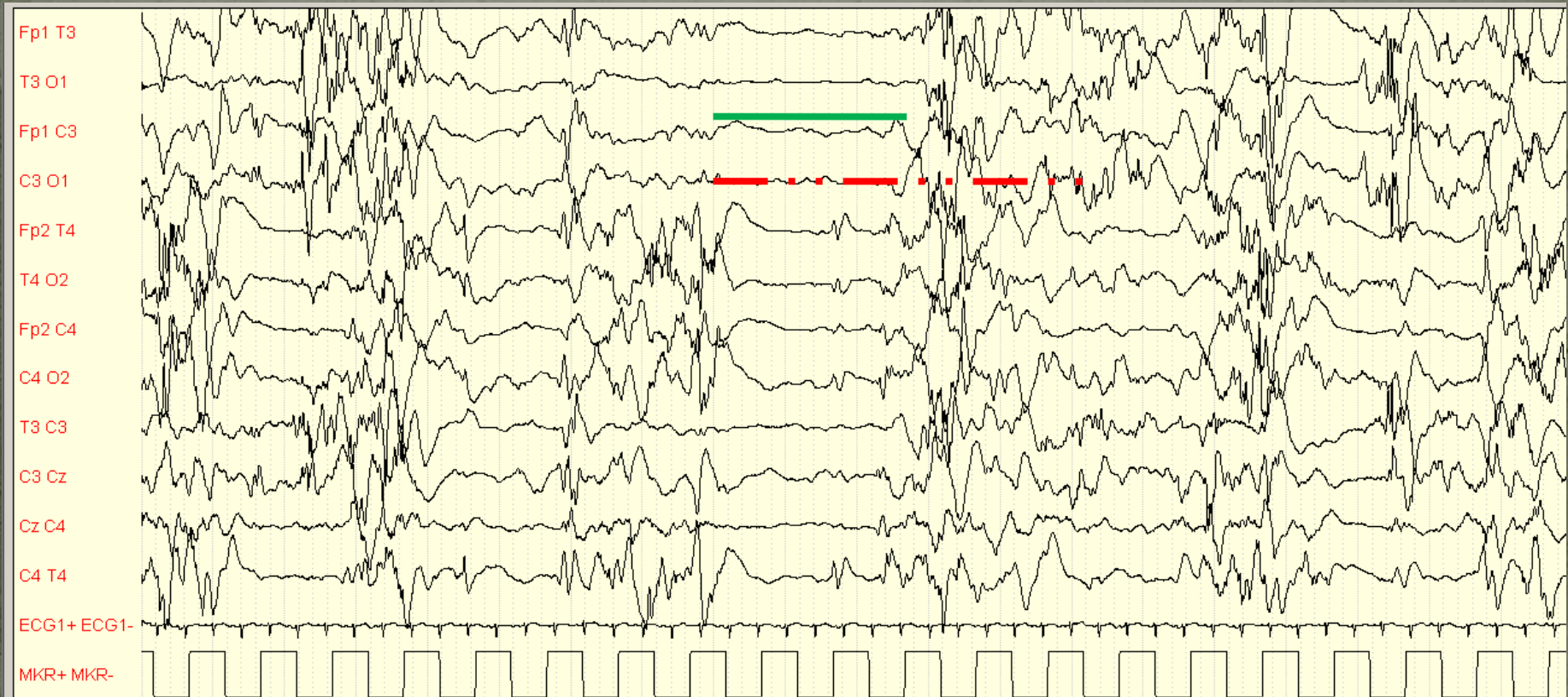


- 19 days of life : 4^o control EEG (Phenitoin + Vigabatrin 5 days of treatment)

Suppression burst pattern

Plentiful Epileptiform multifocal activity

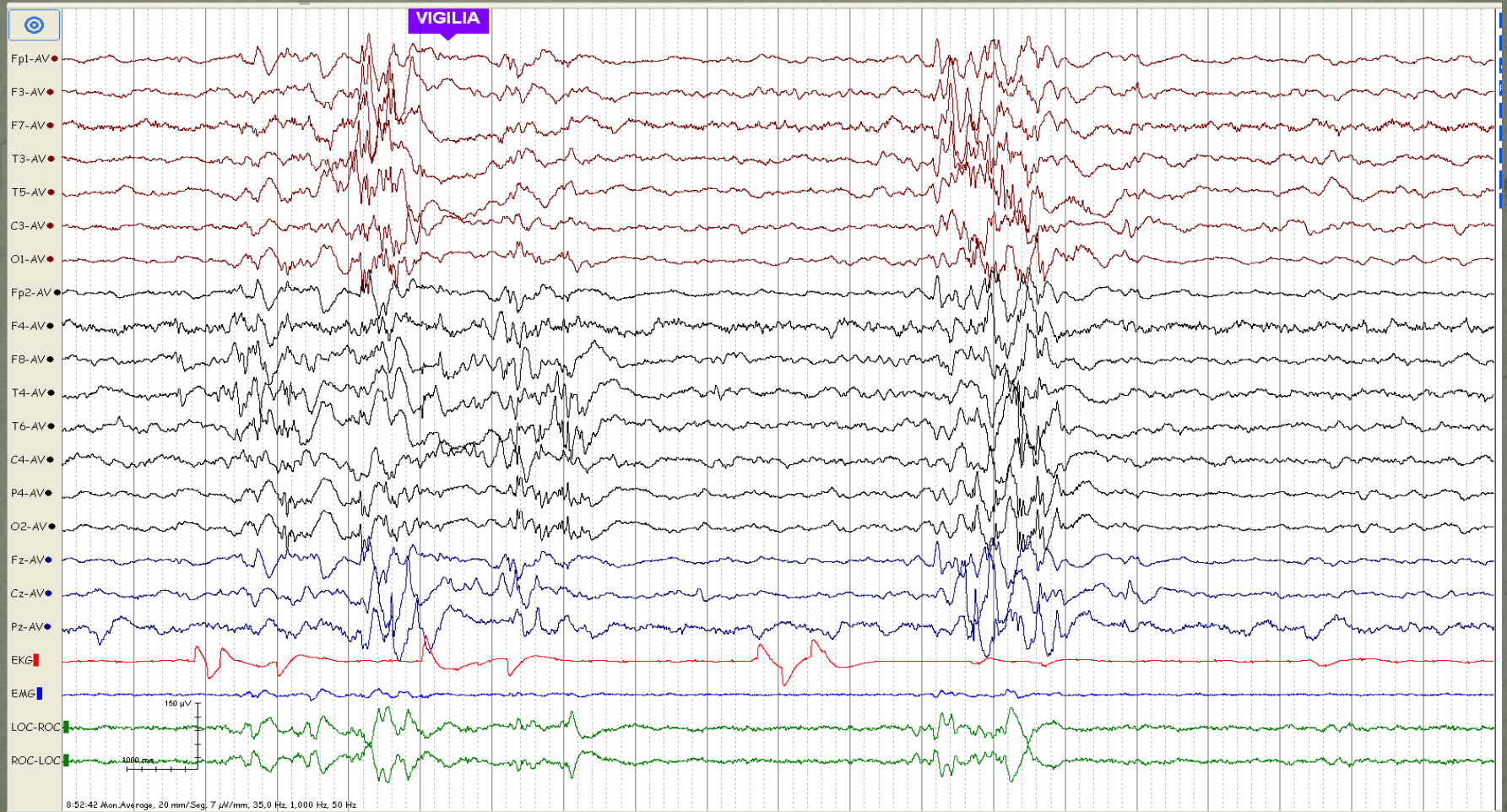
Electroclinical seizure 1 min 30sec



- 27 days of life: 5° EEG control (phenitoin+vigabatrin max. dose)

Suppression burst pattern (++) Sleep)

Multifocal sporadically Sharp waves



70 µV/cm

35 Hz

1 Hz

EEG Diagnosis

Early- Onset Epileptic Encephalopathies

- Estudios de imagen:

- EcoTF y Doppler

Leve aumento de ecogenicidad en la corteza frontal y en la sustancia blanca adyacente a astas frontales de ventrículos laterales.
Hemorragia grado I en la corteza frontal.
Resto sin hallazgos relevantes.

- RMN 4ddv:

An

- Ecografía Abdo

- Eco

- Fondo

Cardiopatía estructural

edad.

• NO METABOLIC DISORDER
• NO GENETIC MUTATION
• NO STRUCTURAL MALFORMATION

- Potenciales Evocados

Auditivos y Visuales:

Dentro de los límites de la normalidad

- Laboratorio:

-Sangre

Ceruloplasmina; cobre, amonio, piruvato, hidroxibutirato beta, acil canitinas, canitina libre
metabolopatia

de ninguna

-LCR

Bioquimica, acidos, aminas biogenas

sores,

-Orina

-CGH

-Estu

os y acido amino

--Normales

- NO METABOLIC DISORDER
- NO GENETIC MUTATION
- NO STRUCTURAL MALFORMATION

- 34 days of life:

- Lethargy with high de irritability
- Little spontaneous eye´s opening
- Axial Hypotonia
- Extremities Hypertonia
- ++ stretch reflexes and clonus.

**Severe
neurologic
disturbance**



OHTAHARA SYNDROME

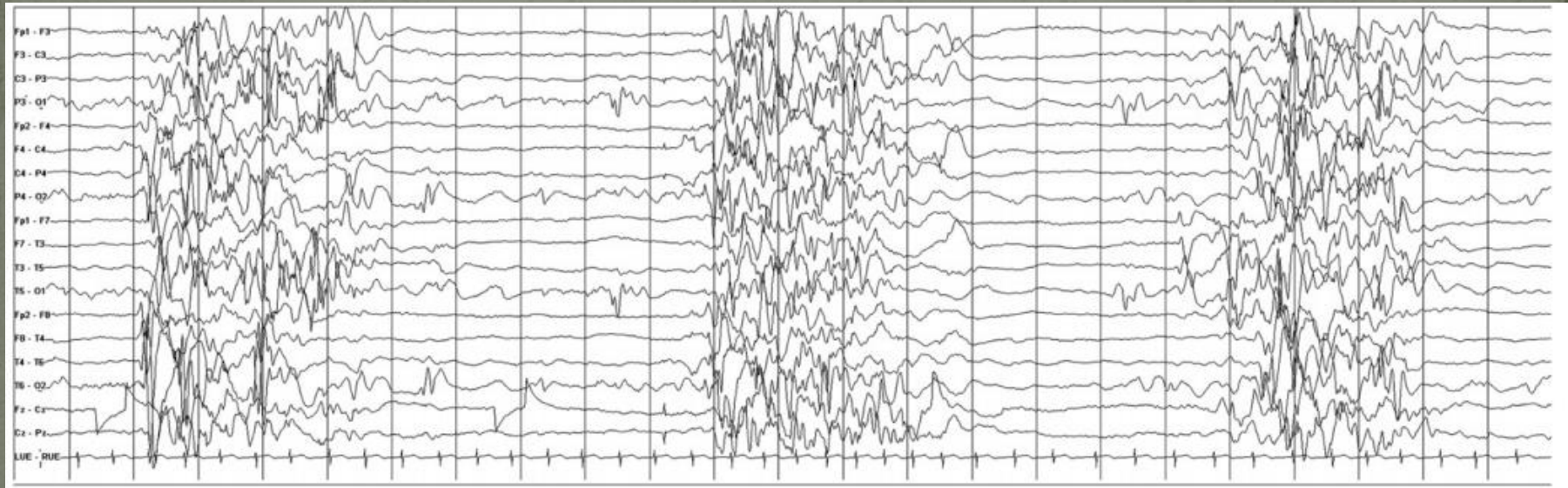
- Early infancy (2w-3m)
- Rare disorder, Unknown prevalency around 100 describes cases.
- Refractory seizures
- **Characteristic electroencephalografic changes**
- Pronosis generally poor (Death/phycomotor impairments)



Shunsuke
Ohtahara,
1930 – 2013

SUPPRESSION BURST PATTERN

Burst of high amplitude spikes and polyspikes that alternate at a regular rate with periods of electric suppression.



Sleep and wakefulness

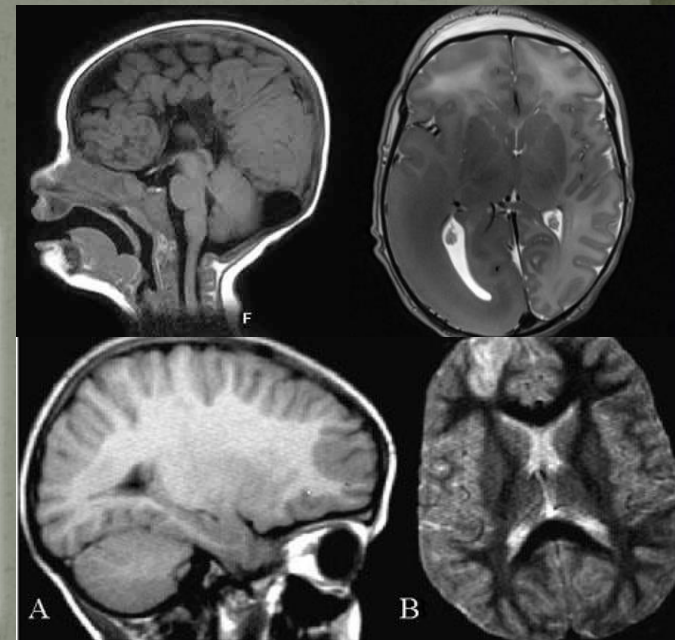
Diagnosis

- **Tonic Spasm** (Hundreds of times per day)

- generalized/lateralized
- Singly/Cluster
- Independent of the sleep cycle

- Other Seizures types

- Focal motor seizures
- Hemiconvulsions
- Generalized tonic-clonic seizures



- **RMN**

- Structural malformations

Metabolic Disorder

- Nonketotic hyperglycinemia
- Cytochrome C oxidase deficiency
- Carnitine palmitoyltransferase deficiency

Genetic Mutations

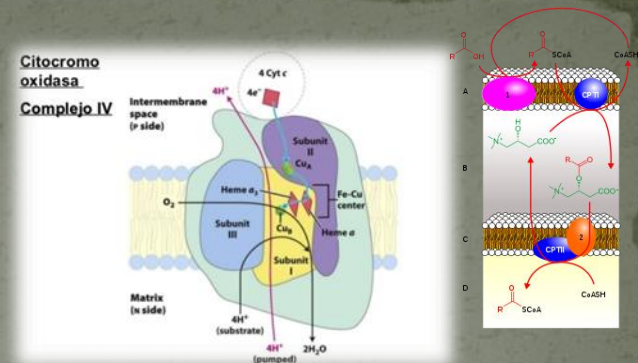


Table 2. Genetic mutations associated with epileptic encephalopathies

Mutation Site	Ohtahara Syndrome	EME	West Syndrome	SMEI	Atypical RTT with Early Epilepsy	EFMR
<u>ARX</u>	Yes		Yes			
<u>CDKL5</u>			Yes		Yes	
<i>ErbB4</i>		Yes				
<i>MAGI2</i>			Yes			
<i>PCDH19</i>				Yes		Yes
<u>PNKP</u>	Yes		Yes			
<i>SCN1A</i>				Yes		
<u>SLC25 A22</u>	Yes					
<u>STXBP1</u>	Yes		Yes			

Abbreviations:

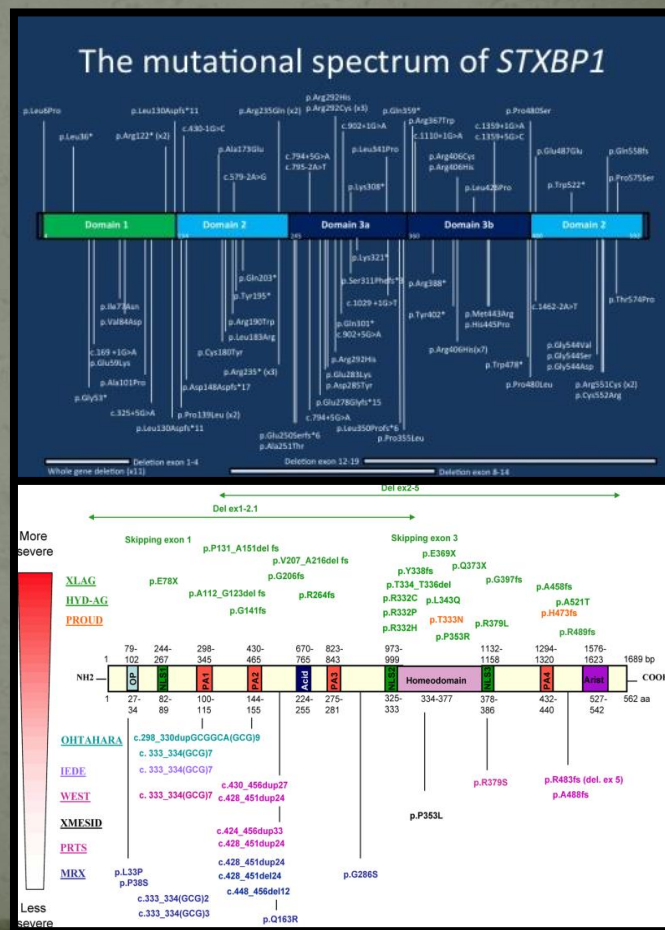
EFMR = Epilepsy and mental retardation limited to females

EME = Early myoclonic encephalopathy

RTT = Rett syndrome



SMEI = Severe myoclonic epilepsy of infancy (also known as Dravet syndrome)

Only epileptic encephalopathy syndromes presenting during infancy are included. Some mutations may also be associated with other conditions, e.g., the *SCN1A* mutation is associated with generalized epilepsy with febrile seizures.



OHTAHARA SYNDROME VS EARLY MYCLONIC ENCEPHALOPATHY

Table 1. Classic differentiation between Ohtahara syndrome and early myoclonic epilepsy

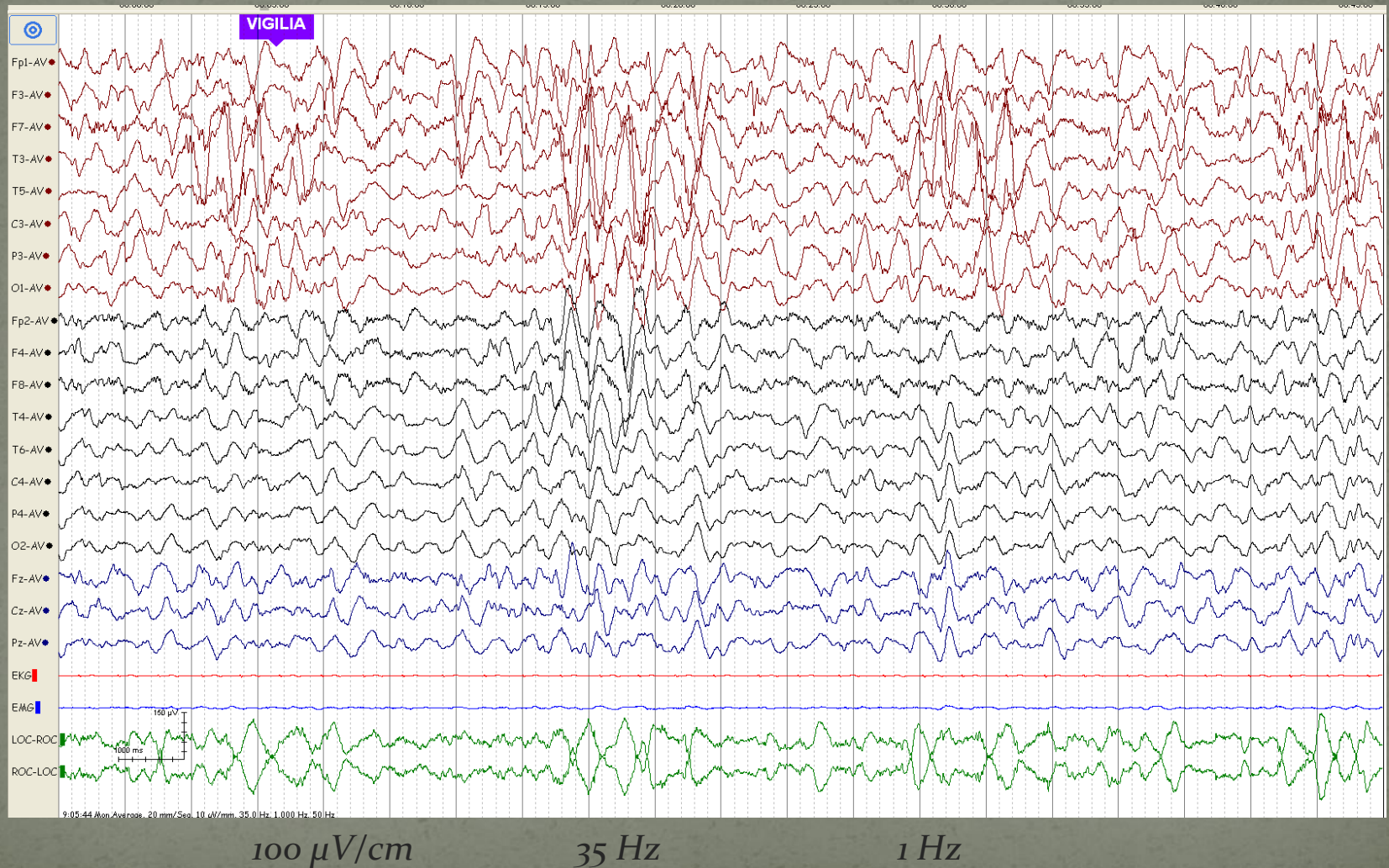
	Ohtahara Syndrome	Early Myoclonic Encephalopathy
EEG pattern	Continuous suppression burst	Discontinuous pattern, suppression burst not always evident at first, and often more distinct during sleep
Primary seizure type	Tonic spasms 	Myoclonus 
Other seizure types	Focal motor seizures Hemiconvulsions Generalized tonic-clonic seizures	Focal motor seizures Tonic spasms
Major etiology	Structural lesions	Metabolic abnormalities
Evolution of disease	75% progress to West syndrome, 12% progress to Lennox-Gastaut syndrome	Up to 50% develop transient atypical hypsarrhythmia, with subsequent return to the suppression burst pattern

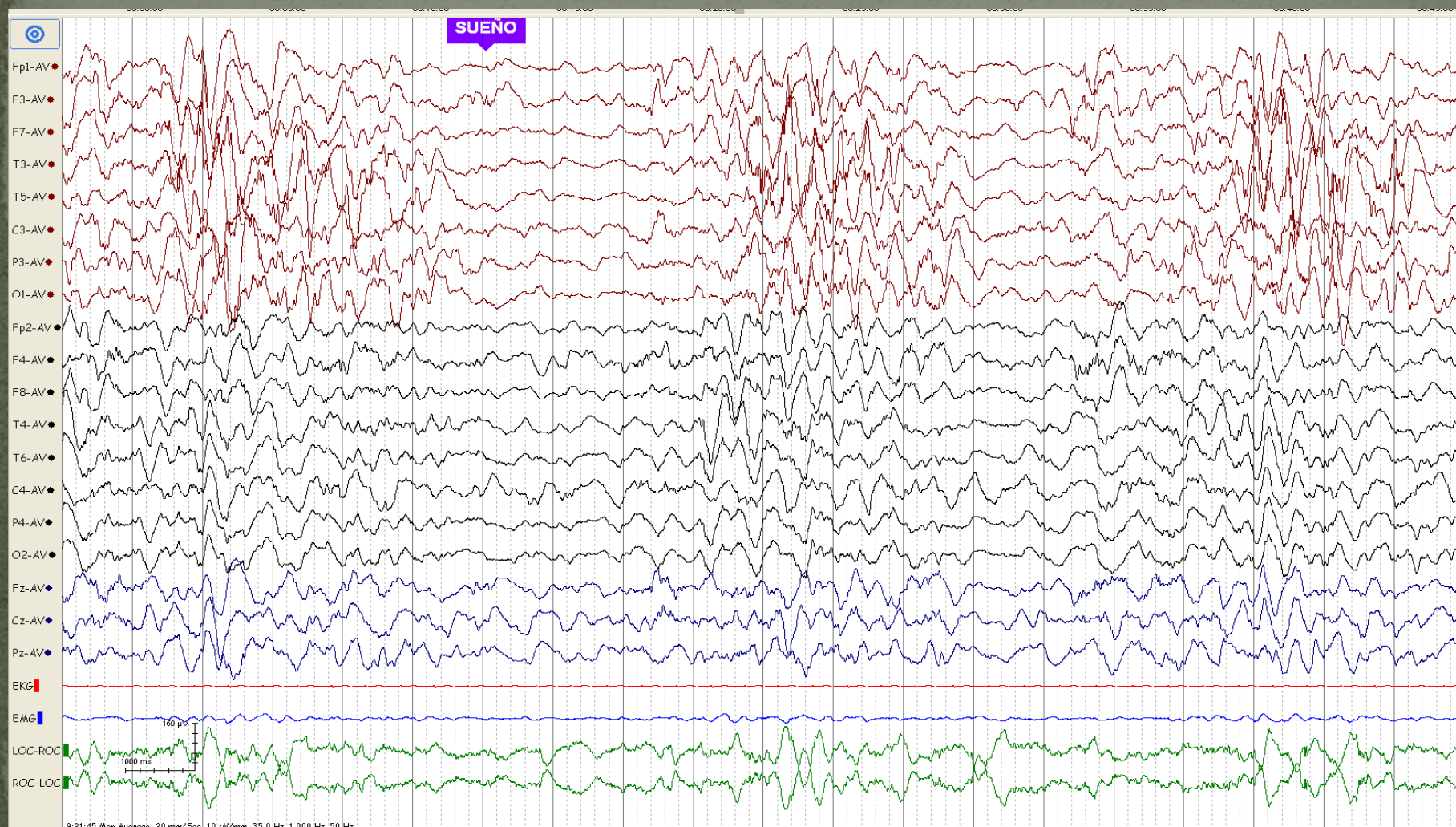
Abbreviation:

EEG = Electroencephalogram

J.C. Beal et al. / Pediatric Neurology 47 (2012) 317e323

- 6 months and 5 days 6° control EEG(Zonisamide+Phenitoin)
- Unstructured and slowed Brain activity
- Epileptiform activity multifocal Left Temporoparietal – Bifrontal
- Tonic seizures 1-2 h/day.





9:21:45 Mon. Average, 20 mm/Sec, 10 μ V/mm, 35.0 Hz, 1,000 Hz, 50 Hz

100 μ V/cm

35 Hz

1 Hz

CONCLUSION

- OS y EME are defined by their clinical presentation and specific electroencephalographic findings.
- Considerable overlap between these conditions can occur.
- Differentiating can be difficult early in the course they have been conceptualized by some as part of the same continuum disease.
- EME is most often associated with inborn errors of metabolism, a number of cases are considered cryptogenic. OS typically associated with structural developmental brain anomalies.

- Main etiology is unknown in the present case, it reminds OS.
- Treatment is often unsuccessful.
- EEG is a very important diagnosis, monitoring and prognosis skill, however knowledge and right interpretation in EEG finding are very helpful for handling correctly this pathologies.

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Thank you