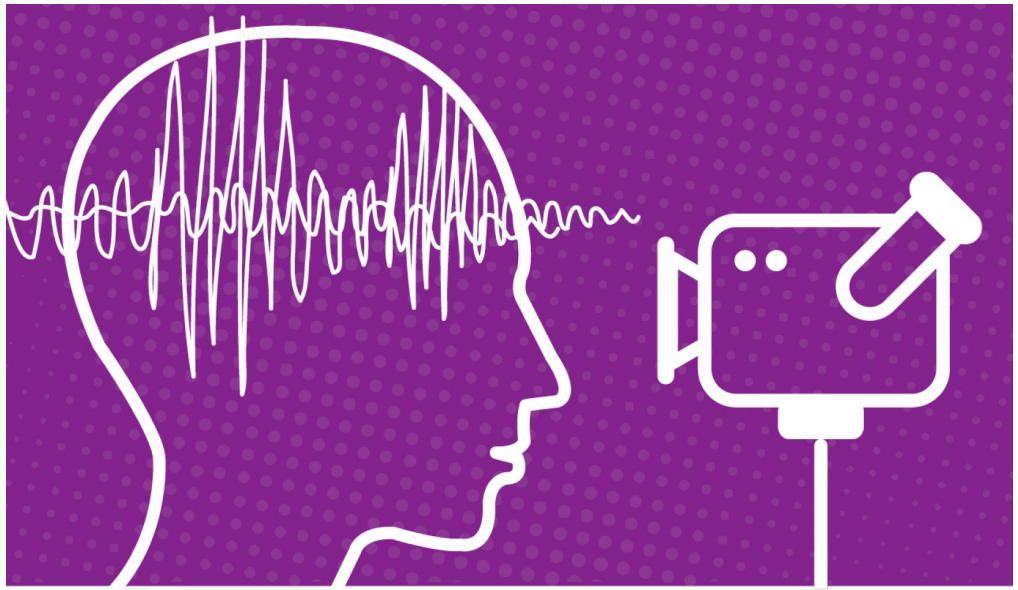


CORSO VIDEO EEG LICE
3° EDIZIONE
CATANIA, 24-27 OTTOBRE 2021

Manifestazioni & EEG nell'adulto

Stefano Meletti

UNIVERSITAS STUDIORUM MUTINENSIS ET REGIENSIS 1175
UNIMORE
UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

Azienda Ospedaliero - Universitaria Modena

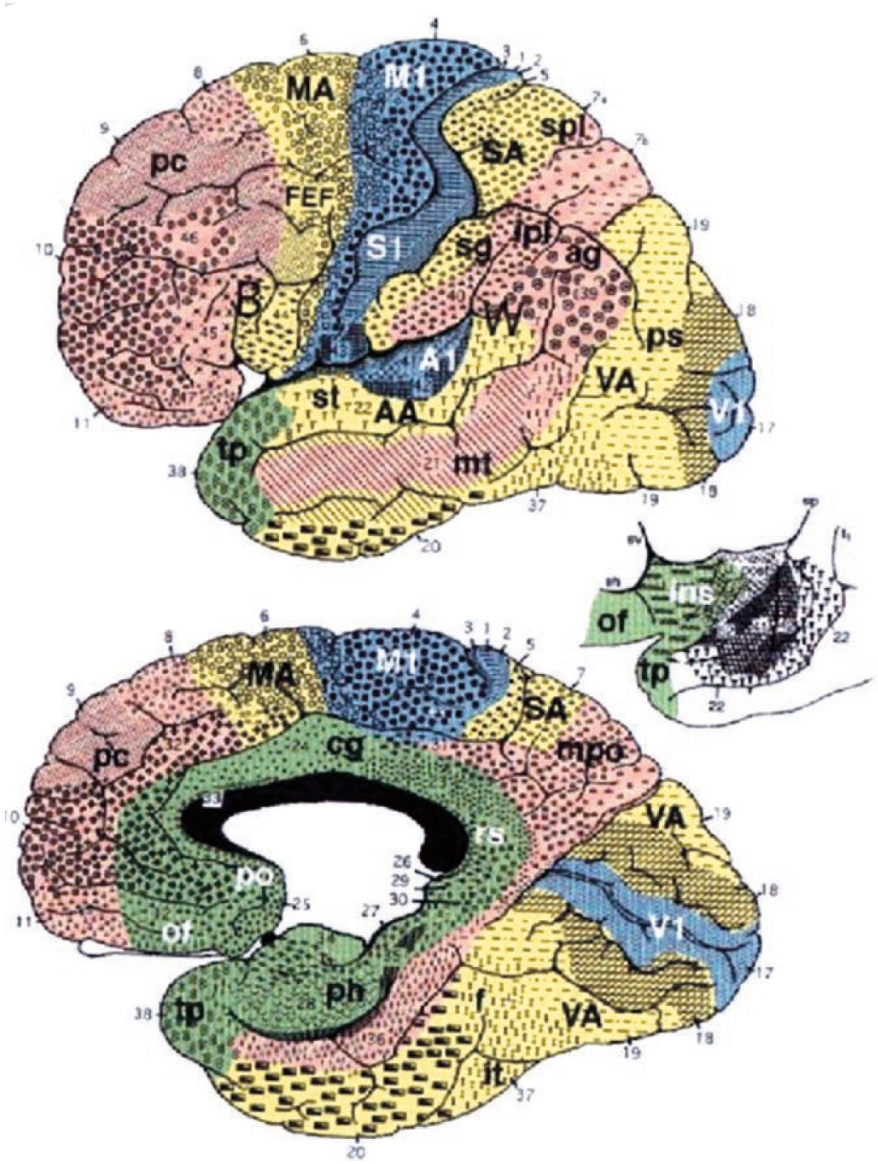
eziologia

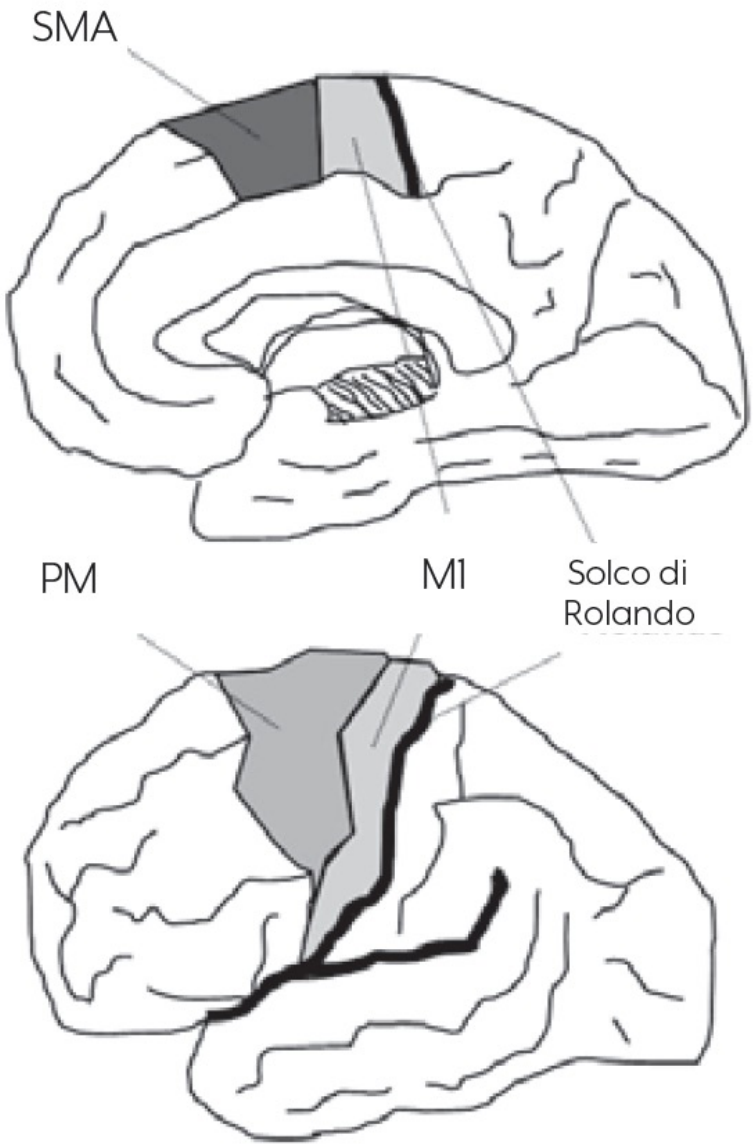
localizzazione

Tempo
(eziologia acuta
vs cronica)

Stato (veglia vs
sonno)

età

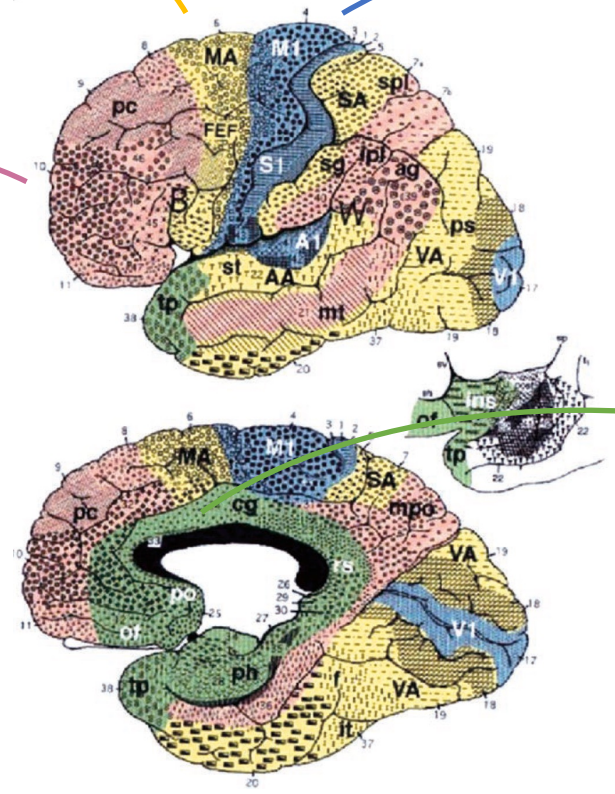

MA
M1
SA
spl
pc
FEF
S1
ipl
sg
ag
B
W
A1
ps
VA
st
AA
V1
tp
mt
ins
of
tp
MA
M1
SA
pc
cg
mpo
ts
VA
po
of
V1
ph
tp
f
VA
it


SMA
PM
M1
Solco di
Rolando

M & EEG - *localizzazione*

Tonic posturing
Versive
Negative motor

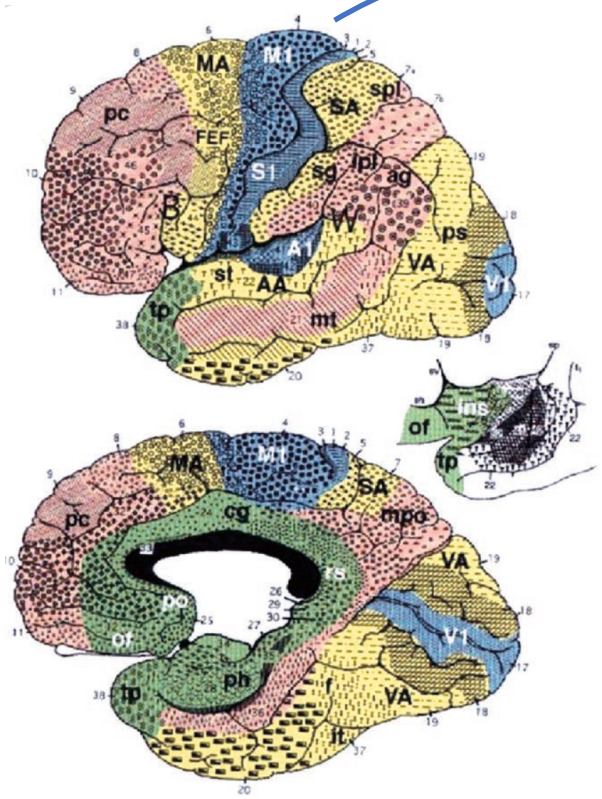
Discognitive



Focal motor
Positive myoclonus
Negative myoclonus

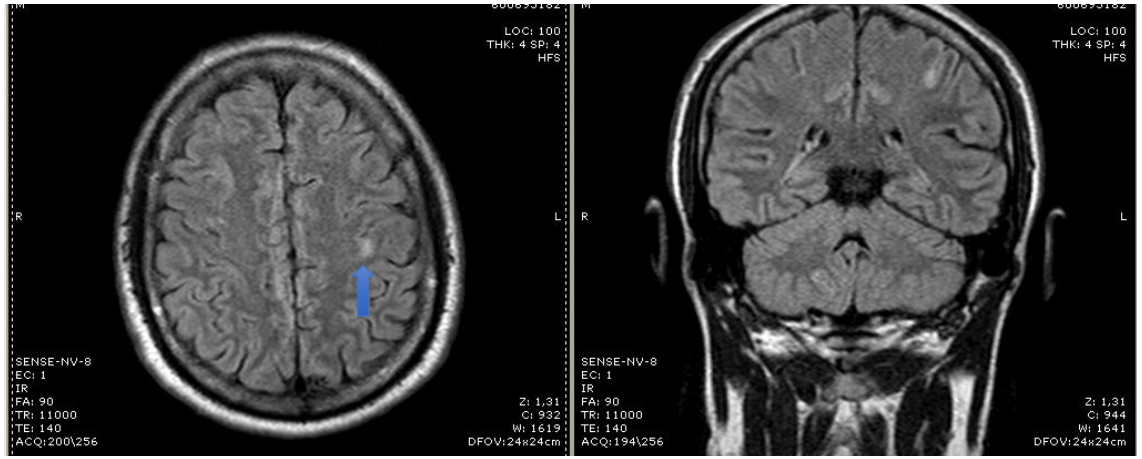
Emotion
Automatism
Hyperkinteic

M & EEG - *localizzazione*



Focal motor
Positive myoclonus
Negative myoclonus

Corteccia motoria: *focale motoria*



MRI. Sezione assiale e coronale FLAIR. La freccia indica la lesione ischemica acuta rolandica sinistra.

Mano > spalla > testa/collo

Consapevolezza preservata

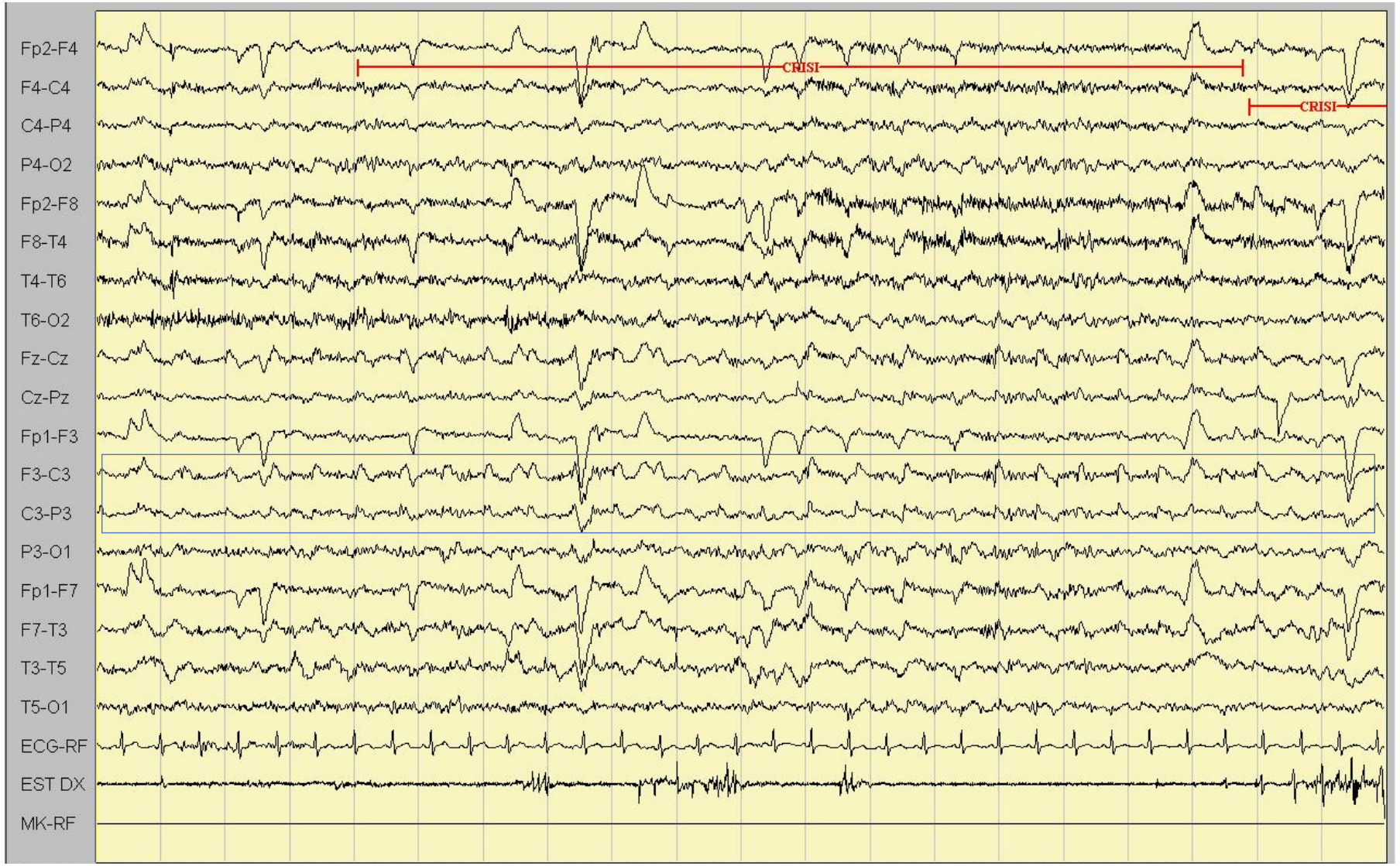
Corteccia motoria: *focale motoria*

Crisi-a

Le frecce indicano le punte in regione centrale sinistra, via via più ritmiche

Corteccia motoria: *focale motoria*

Crisi-b

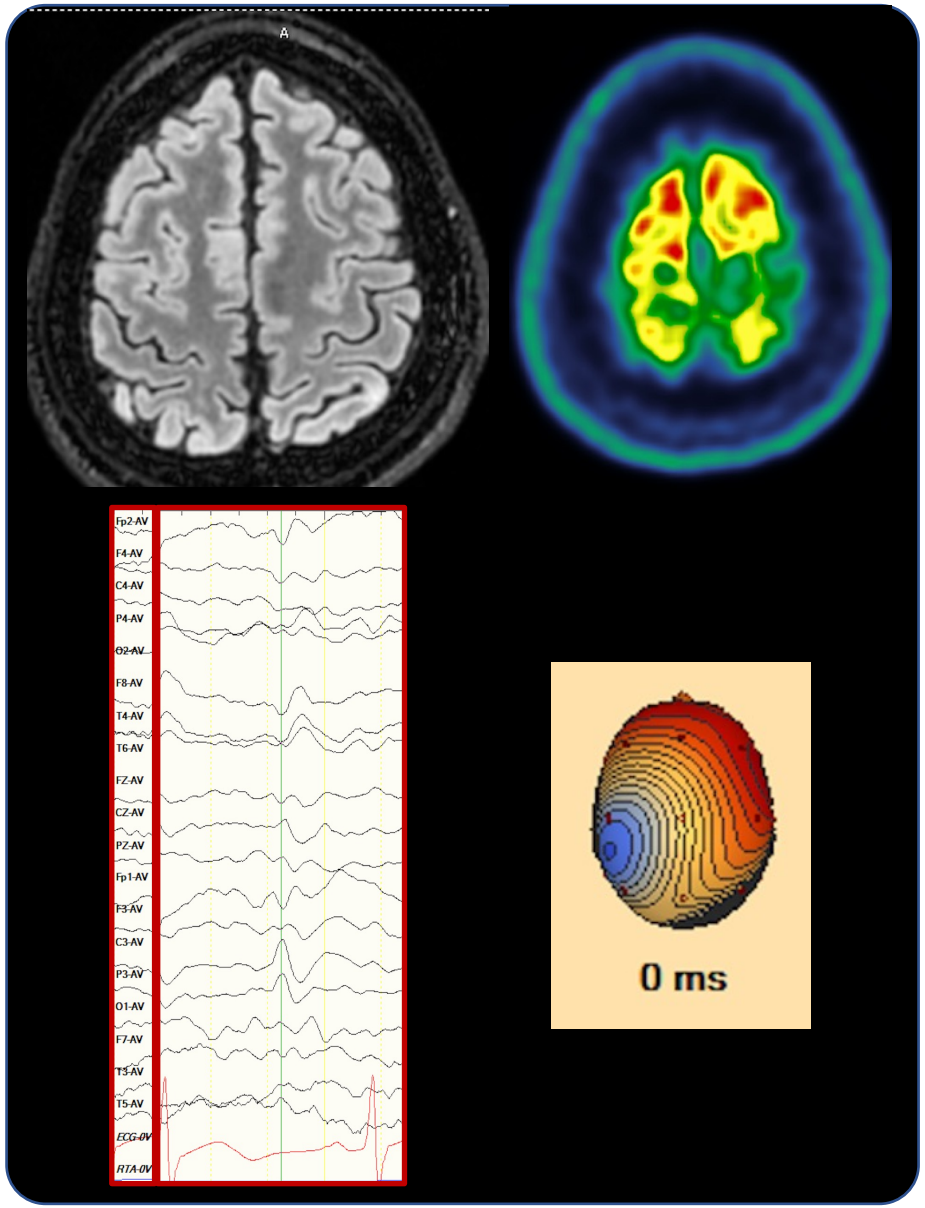


Corteccia motoria: *focale motoria*

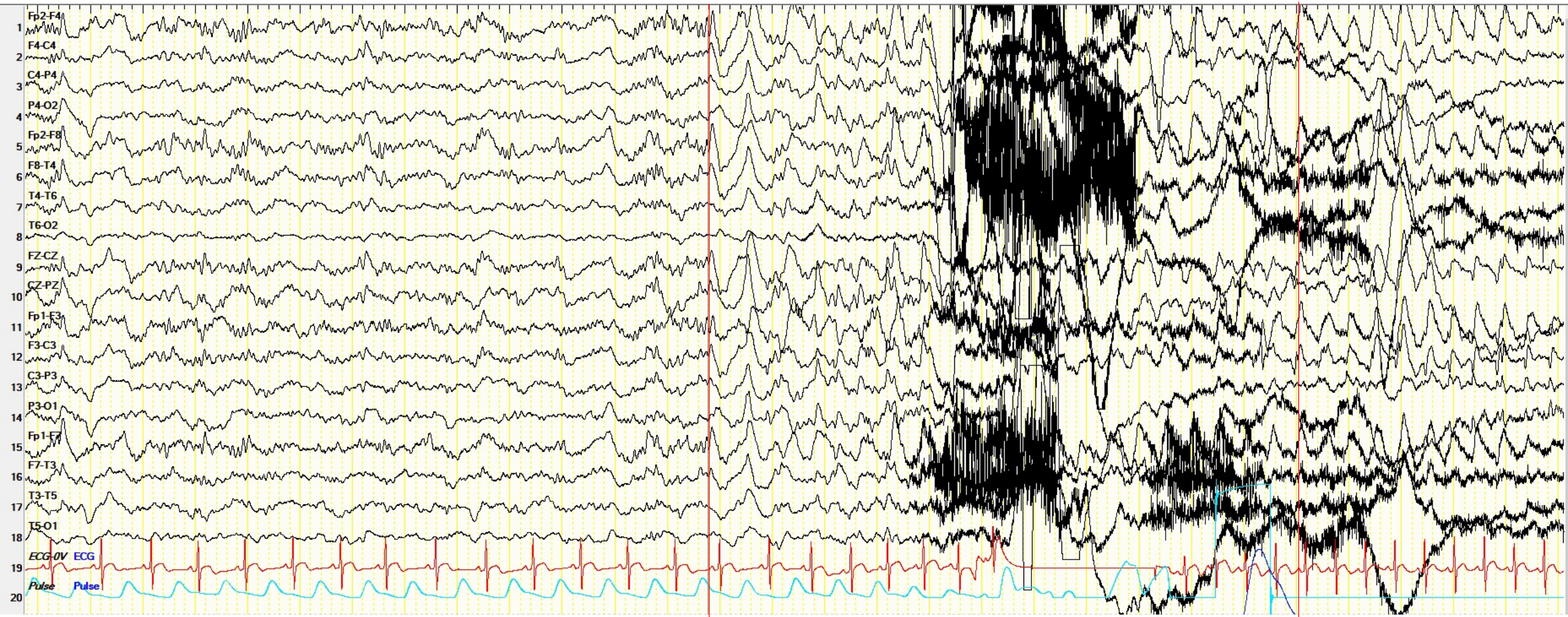
Crisi-c

Il riquadro indica l'attività ritmica nella regione centrale di sinistra. Nota le contrazioni ritmiche nel canale poligrafico in rapporto di 1 : 1 con le punte sul tracciato EEG.

Corteccia motoria: *focale "negative motor"*



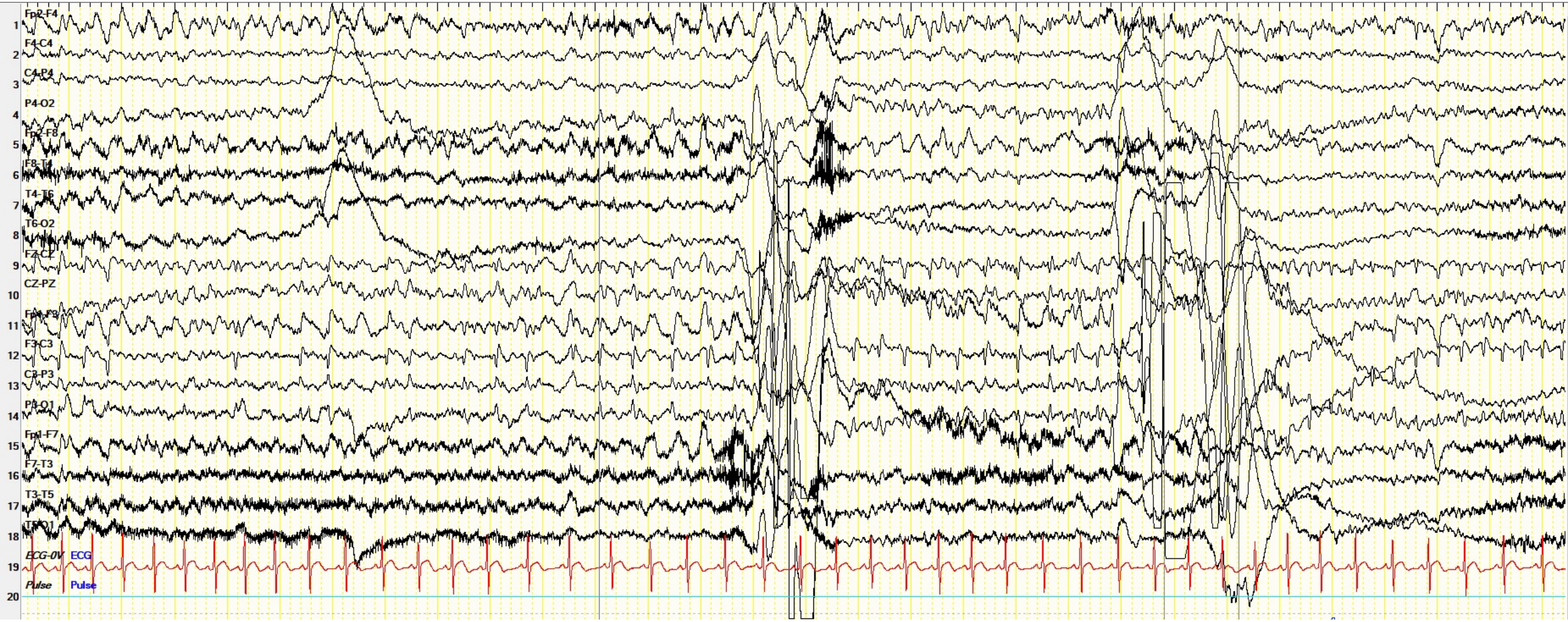
EEG



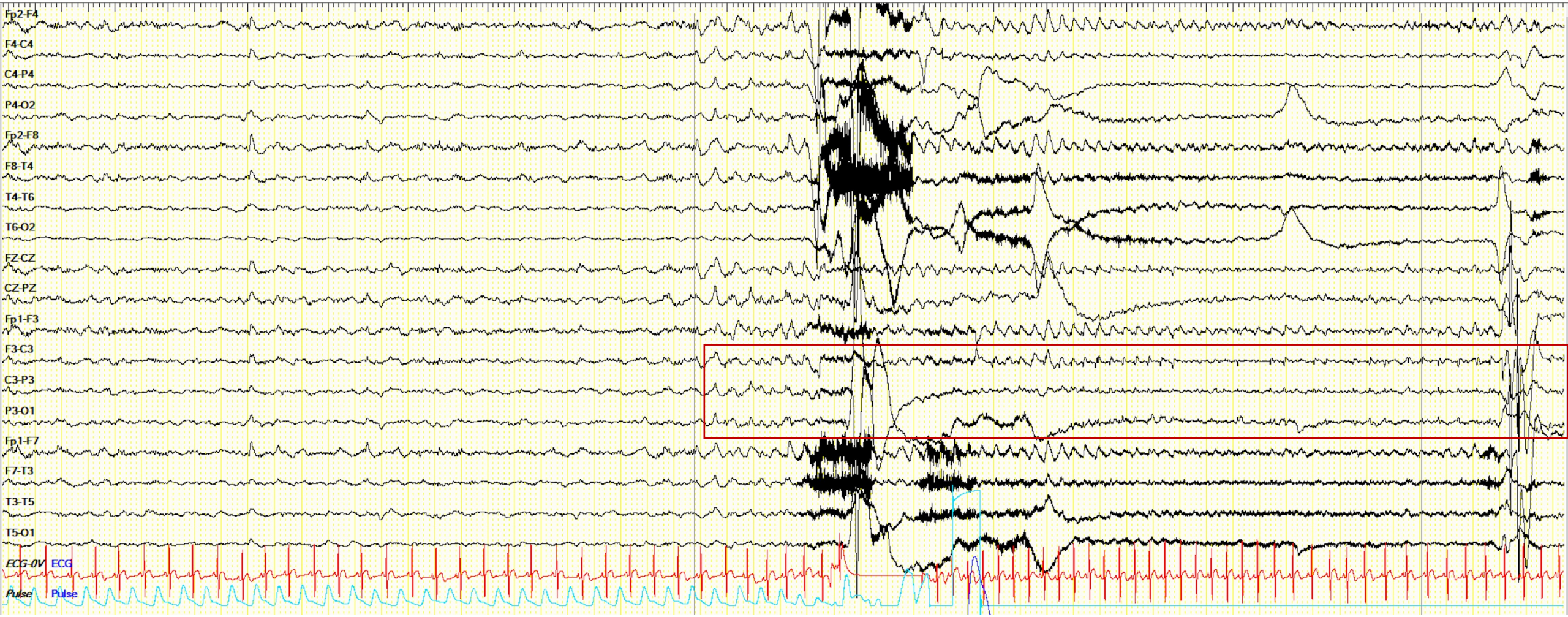
risveglio

Ipostenia destra

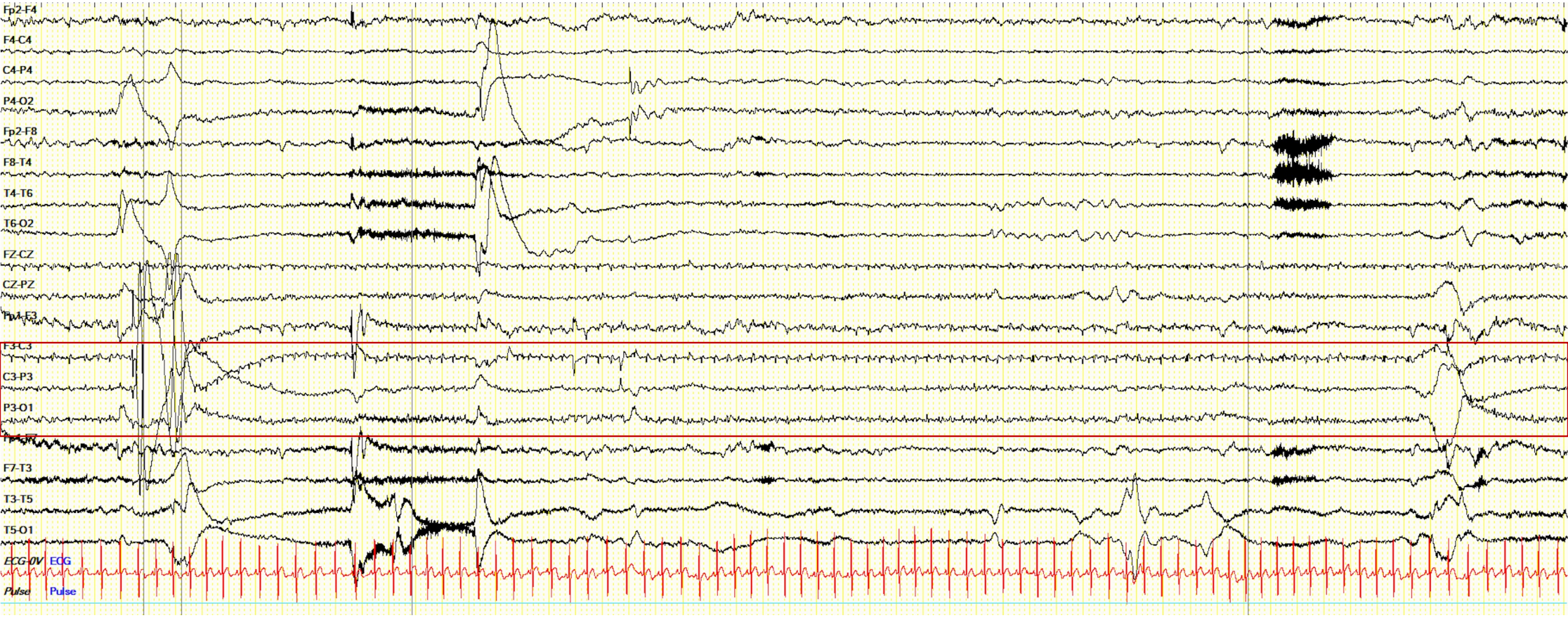
EEG


1 Fp2-F4
2 F4-C4
3 C4-P4
4 P4-O2
5 Fp2-F8
6 F8-T4
7 T4-T6
8 T6-O2
9 FZ-CZ
10 CZ-PZ
11 Fp1-F3
12 F3-C3
13 C3-P3
14 P3-O1
15 Fp1-F7
16 F7-T3
17 T3-T5
18 T5-O1
19 ECG-0V ECG
20 Pulse Pulse

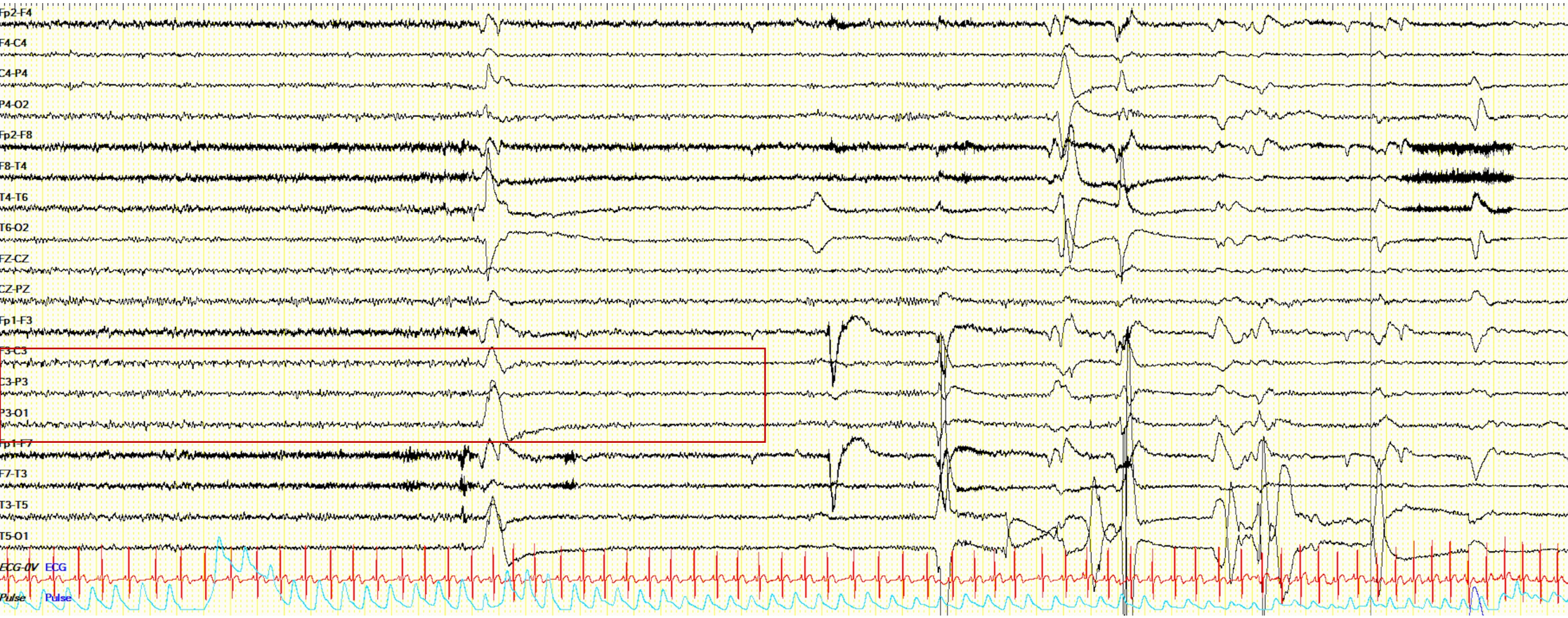
Minuto 1


Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
FZ-CZ
CZ-PZ
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
ECG-0V ECG
Pulse Pulse

Minuto - 2


Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
FZ-CZ
CZ-PZ
Fp1-F3
F3-C3
C3-P3
P3-O1
F7-T3
T3-T5
T5-O1
ECG-0V ECG
Pulse Pulse

Minuto - 5

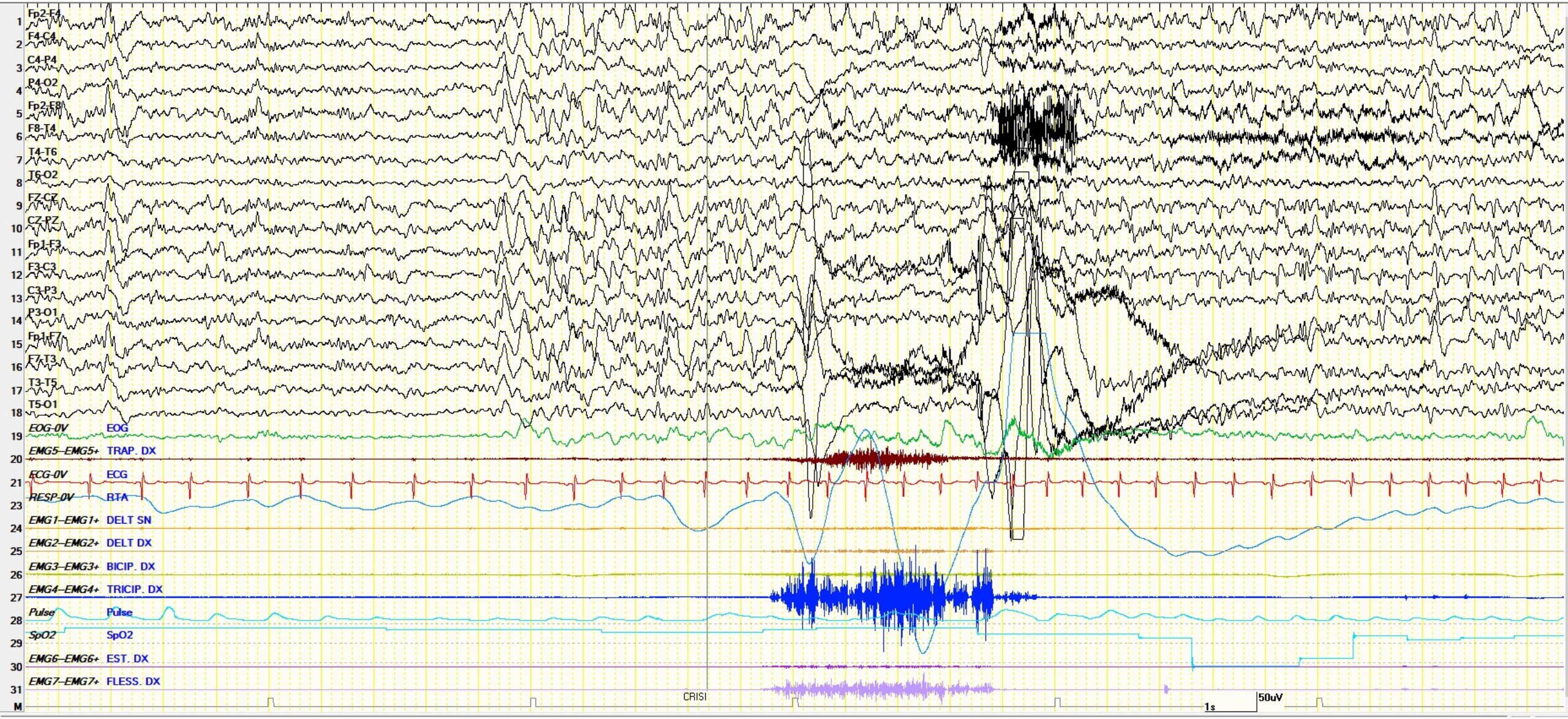

Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
FZ-CZ
CZ-PZ
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
ECG-0V ECG
Pulse Pulse

Corteccia motoria: *“negative > positive”*

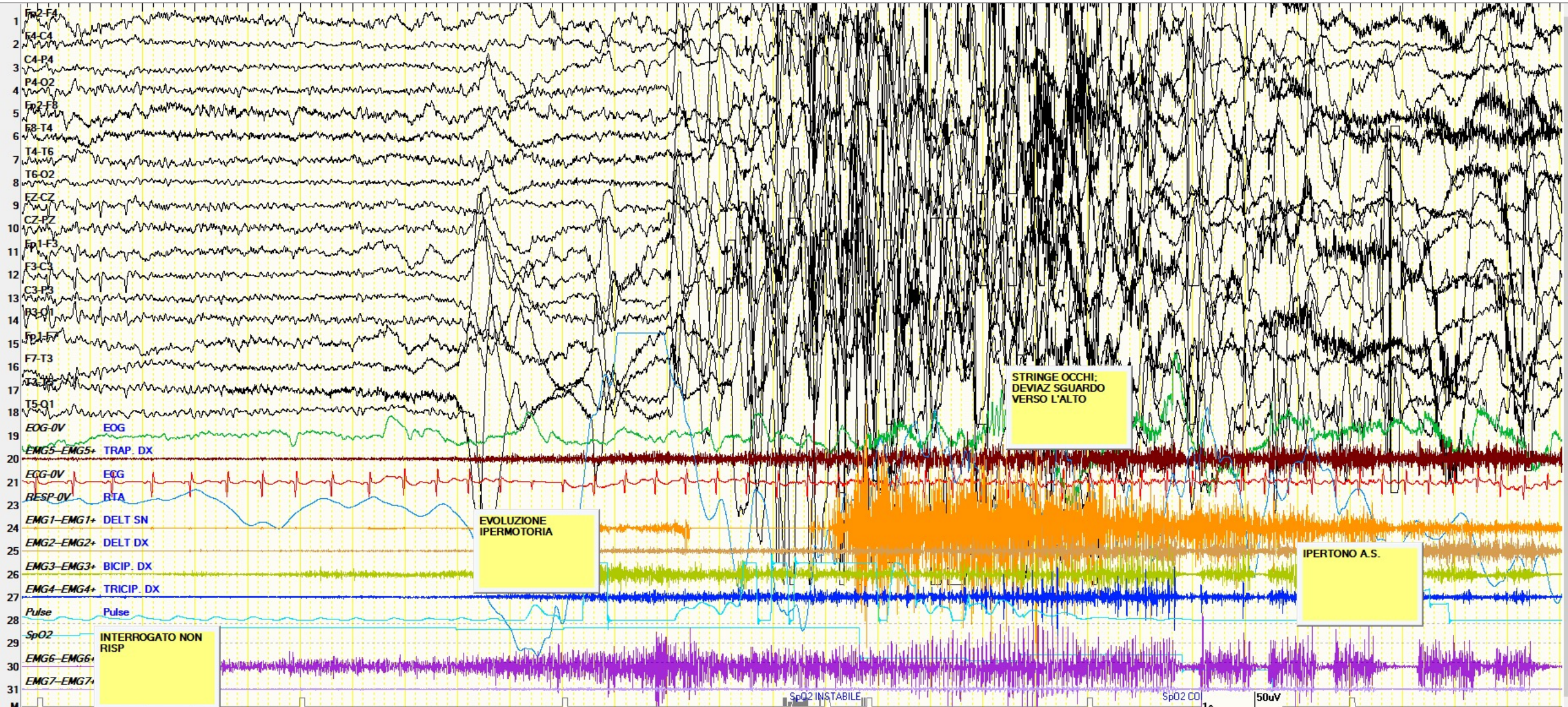
- Crisi a partenza dal sonno;
- Comparsa di ipertono in estensione dell’arto inferiore di destra mentre l’arto superiore è flesso
- Movimenti ipercinetici a tipo calcio dell’arto inferiore sinistro

Il paziente ricorda l’episodio e riferisce di aver avvertito una sensazione come di «tremore interno del braccio destro»

EEG


Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
FZ-CZ
CZ-PZ
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
EOG-0V EOG
EMG5-EMG5+ TRAP. DX
ECG-0V ECG
RESP-0V RTA
EMG1-EMG1+ DELT SN
EMG2-EMG2+ DELT DX
EMG3-EMG3+ BICIP. DX
EMG4-EMG4+ TRICIP. DX
Pulse Pulse
SpO2 SpO2
EMG6-EMG6+ EST. DX
EMG7-EMG7+ FLESS. DX
CRISI
1s
50uV

EEG


Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
FZ-CZ
CZ-PZ
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
EOG-0V EOG
EMG5–EMG5+ TRAP. DX
ECG-0V ECG
RESP-0V RTA
EMG1–EMG1+ DELT SN
EMG2–EMG2+ DELT DX
EMG3–EMG3+ BICIP. DX
EMG4–EMG4+ TRICIP. DX
Pulse Pulse
SpO2
EMG6–EMG6+
EMG7–EMG7+
STRINGE OCCHI; DEVIAZ SGUARDO VERSO L'ALTO
EVOLUZIONE IPERMOTORIA
IPERTONO A.S.
INTERROGATO NON RISP
SpO2 INSTABILE
SpO2 CO
50uV

Negative motor phenomena

I fenomeni motori negativi critici sono rare ma importanti manifestazioni delle epilessie focali che coinvolgono il sistema motorio.

Derivano dall'attivazione epilettica delle cosidette « aree corticali motorie negative», localizzate all'interno del sistema motorio.

Case Reports > Epileptic Disord. 2000 Sep;2(3):163-8.

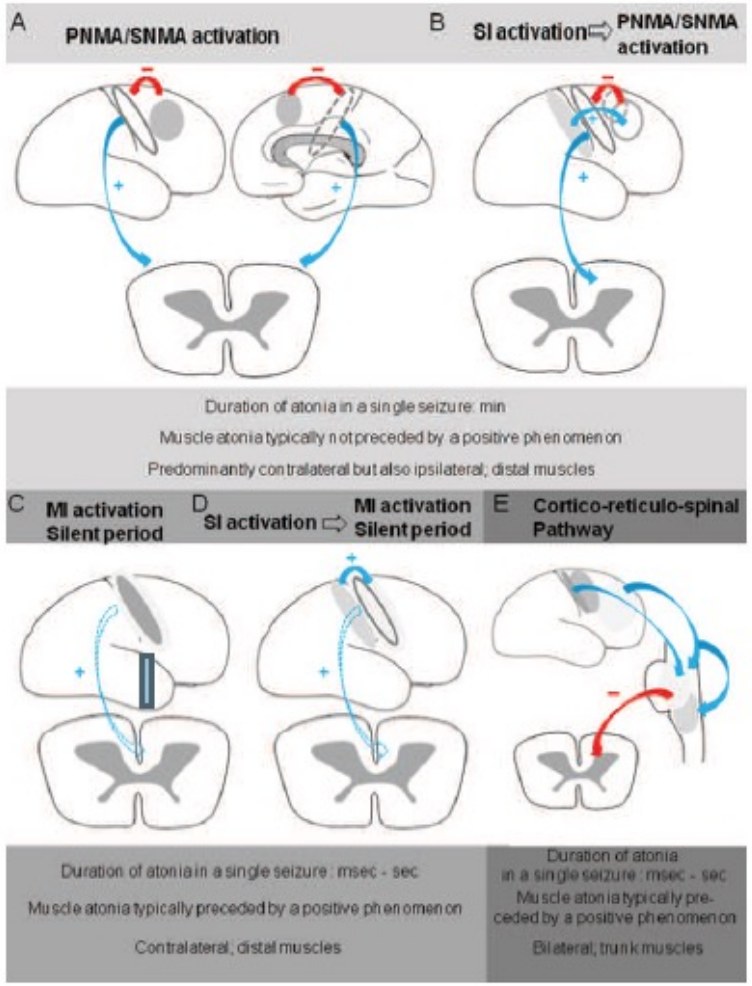
Epileptic negative myoclonus and brief asymmetric tonic seizures. A supplementary sensorimotor area involvement for both negative and positive motor phenomena

S Meletti [1], P Tinuper, F Bisulli, M Santucci

Affiliations + expand

PMID: 11022141

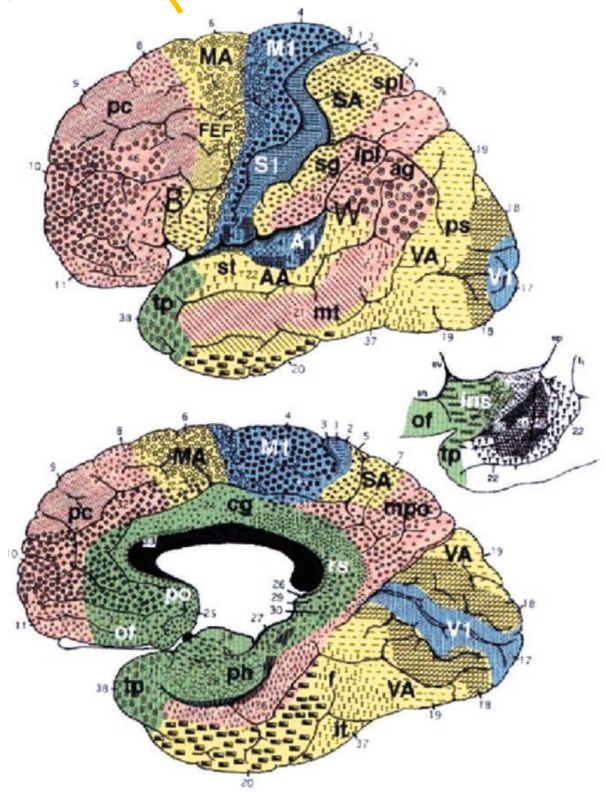
Free article



Atonic phenomena in focal seizures: Nomenclature, clinical findings and pathophysiological concepts. Stjepana Kovac, Beate Diehl

M & EEG - *localizzazione*

Tonic posturing
Versive
Negative motor

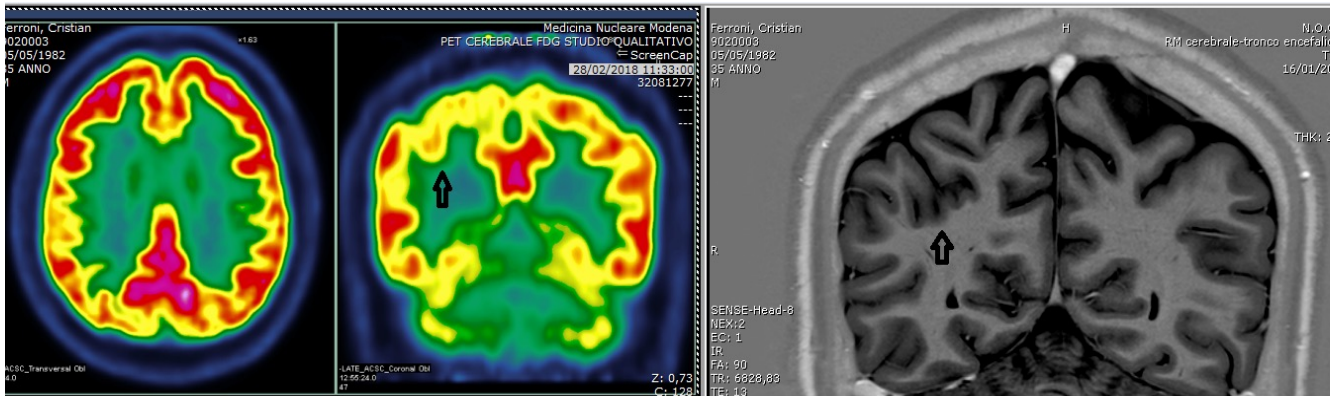


Corteccie premotorie

- ✓Età di insorgenza delle crisi: 31 aa
- ✓Frequenza e semeiologia delle crisi
  - ✓ comparsa di episodi che descrive come "crampi" alla mano sinistra: in particolare quando la utilizza a lungo o quando deve eseguire movimenti fini e precisi, la mano acquisisce una postura distonica forzata con le dita antero-flesse.

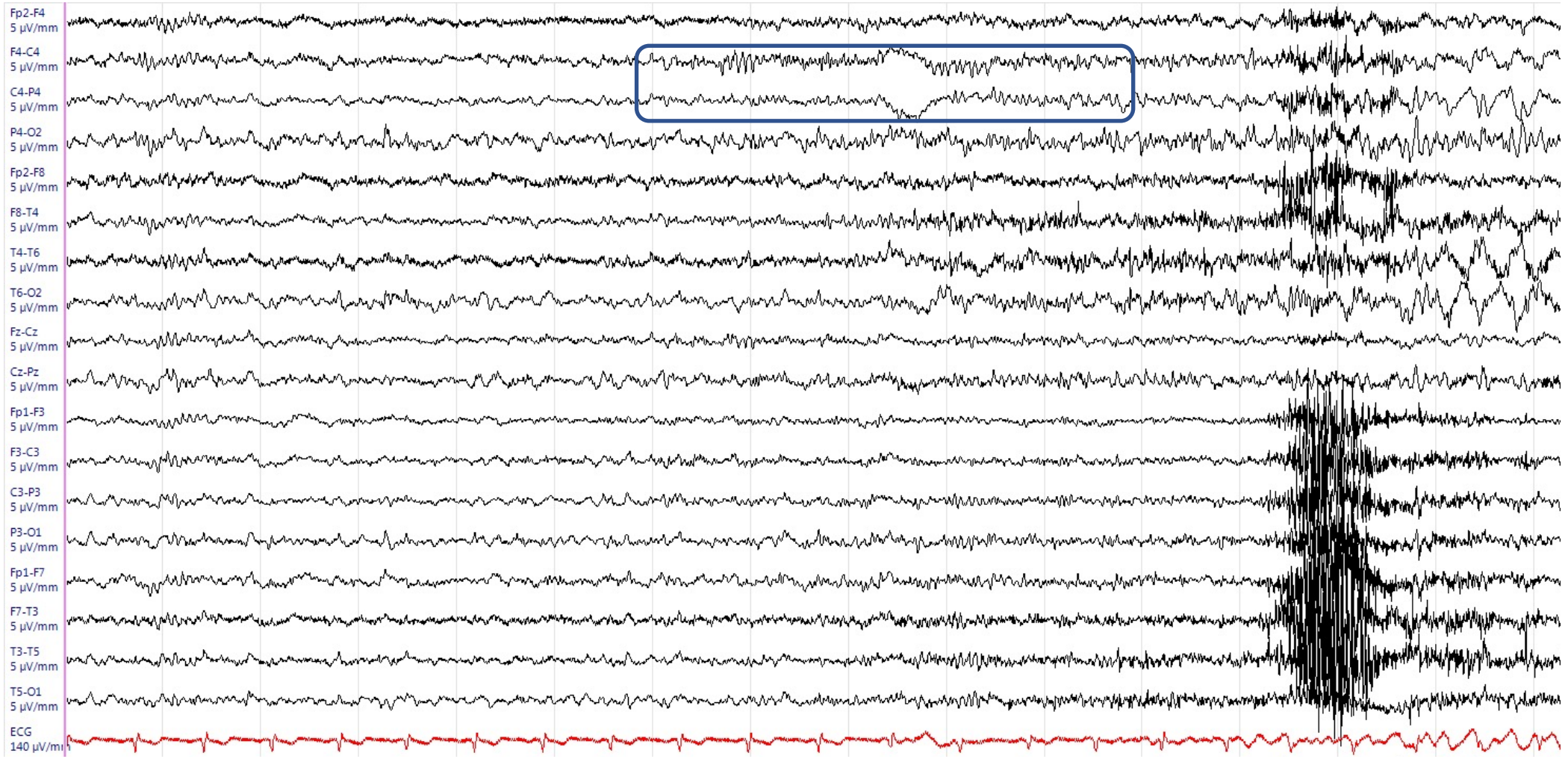
    Frequenza: quotidiana; sia in veglia che in sonno

Corteccie premotorie



EEG

Crisi 1


Fp2-F4
5 µV/mm
F4-C4
5 µV/mm
C4-P4
5 µV/mm
P4-O2
5 µV/mm
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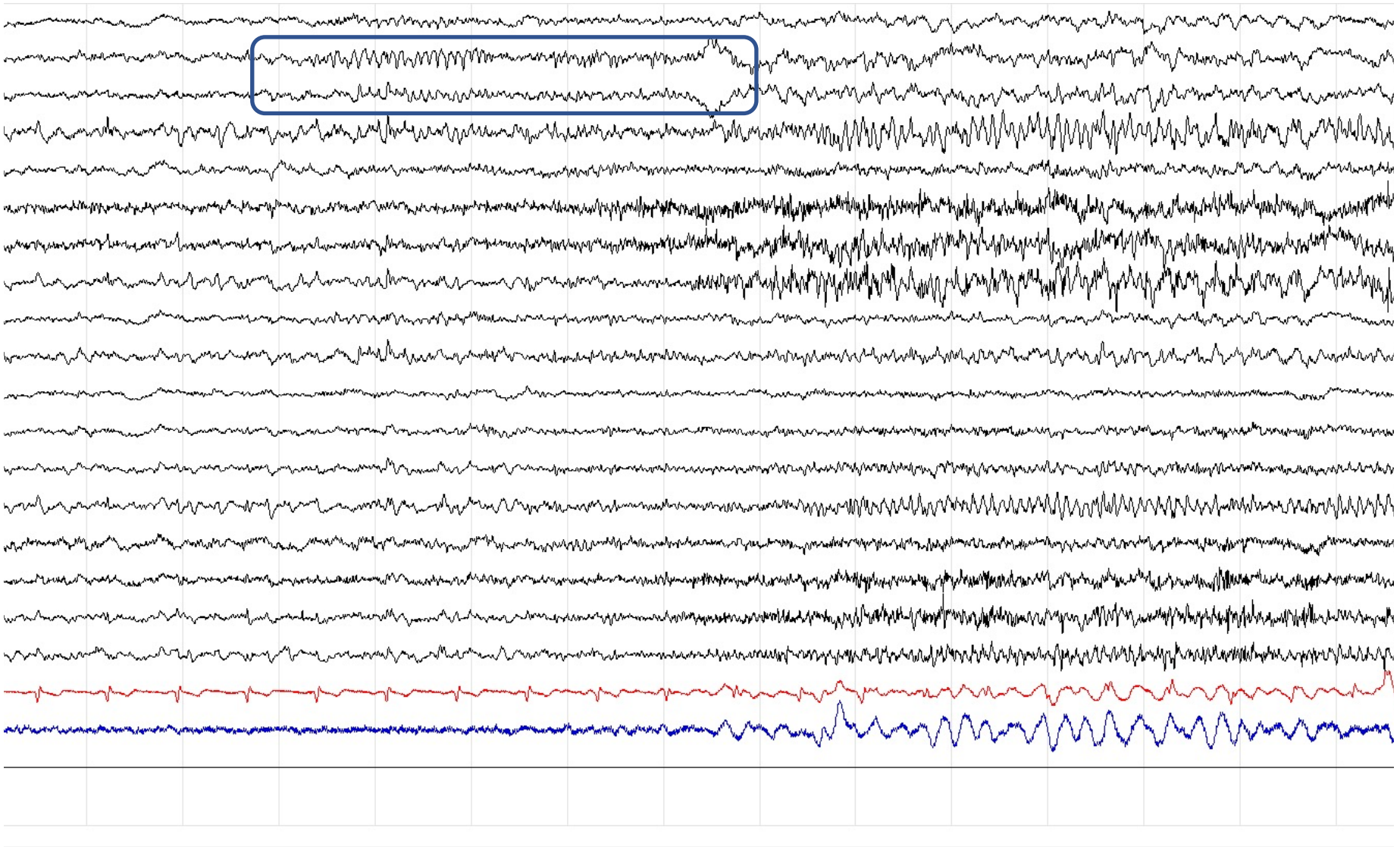
5 µV/mm
F8-T4
5 µV/mm
T4-T6
5 µV/mm
T6-O2
5 µV/mm
Fz-Cz
5 µV/mm
Cz-Pz
5 µV/mm
Fp1-F3
5 µV/mm
F3-C3
5 µV/mm
C3-P3
5 µV/mm
P3-O1
5 µV/mm
Fp1-F7
5 µV/mm
F7-T3
5 µV/mm
T3-T5
5 µV/mm
T5-O1
5 µV/mm
ECG
140 µV/m

EEG

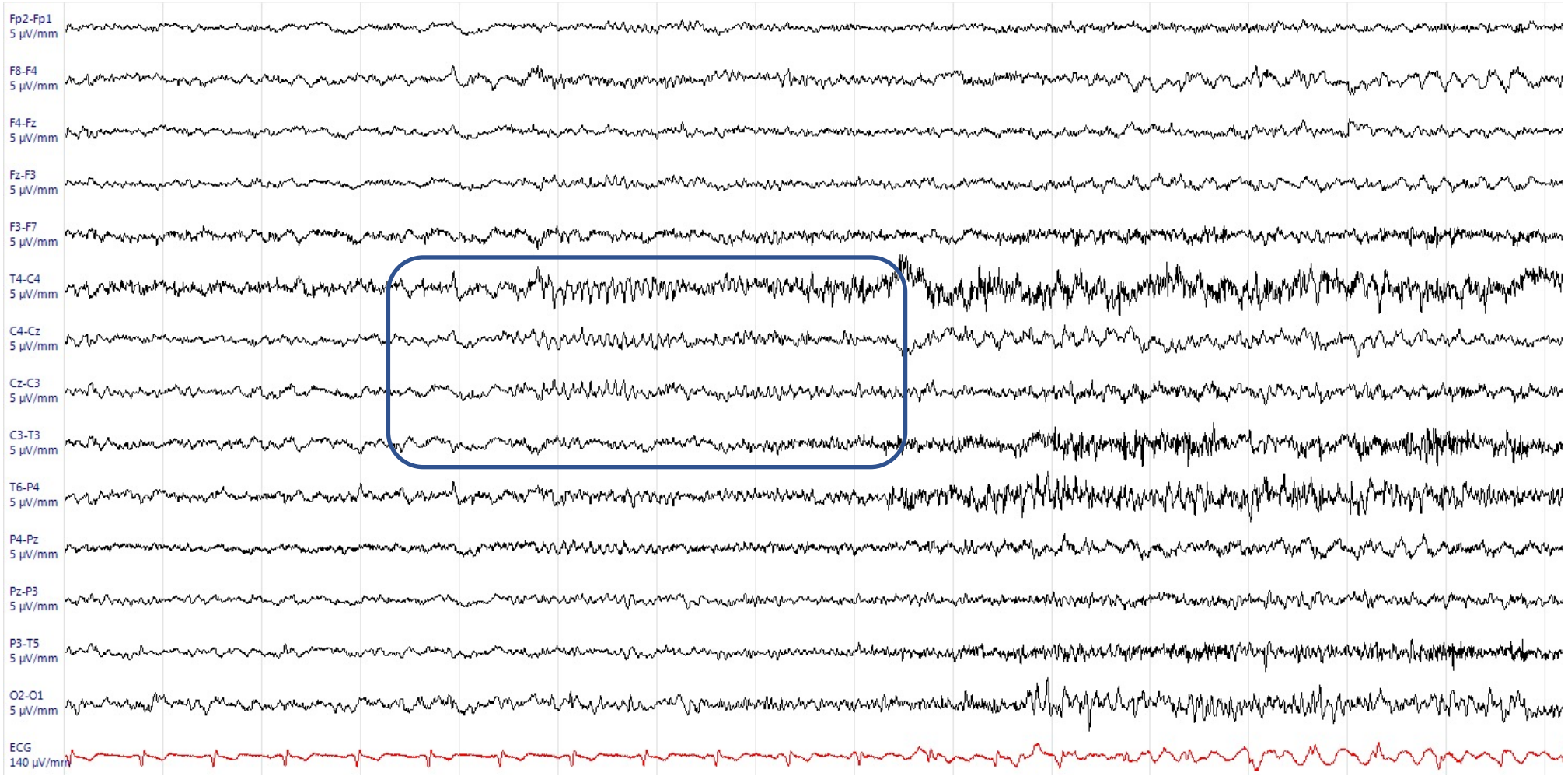
Crisi 2



EEG

Crisi 3

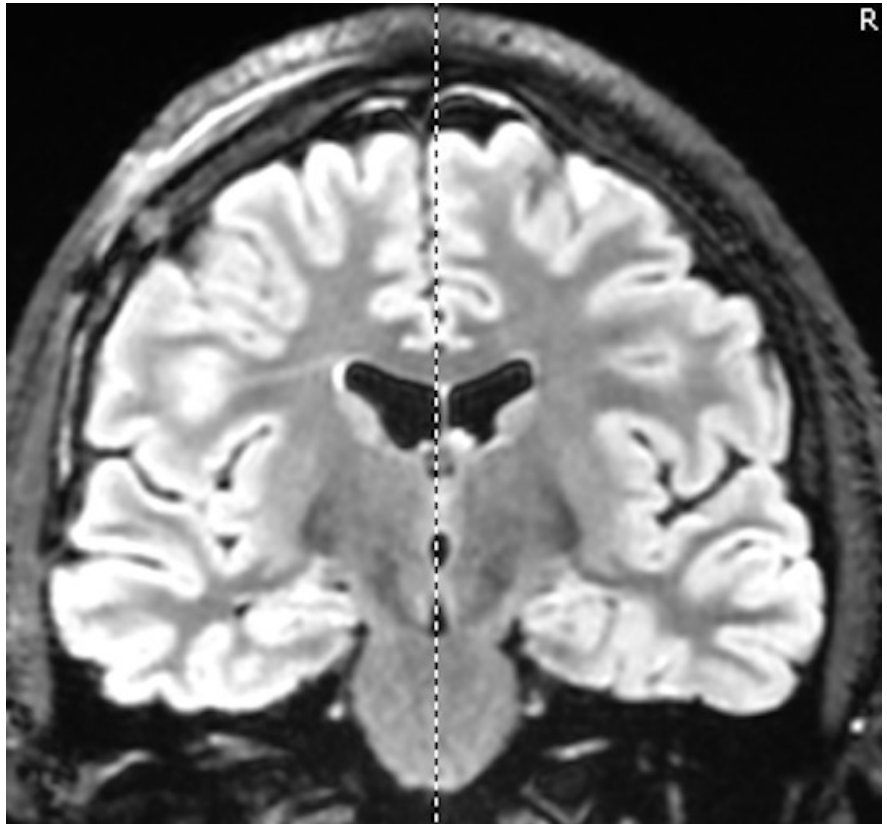
Montaggio «trasversale»



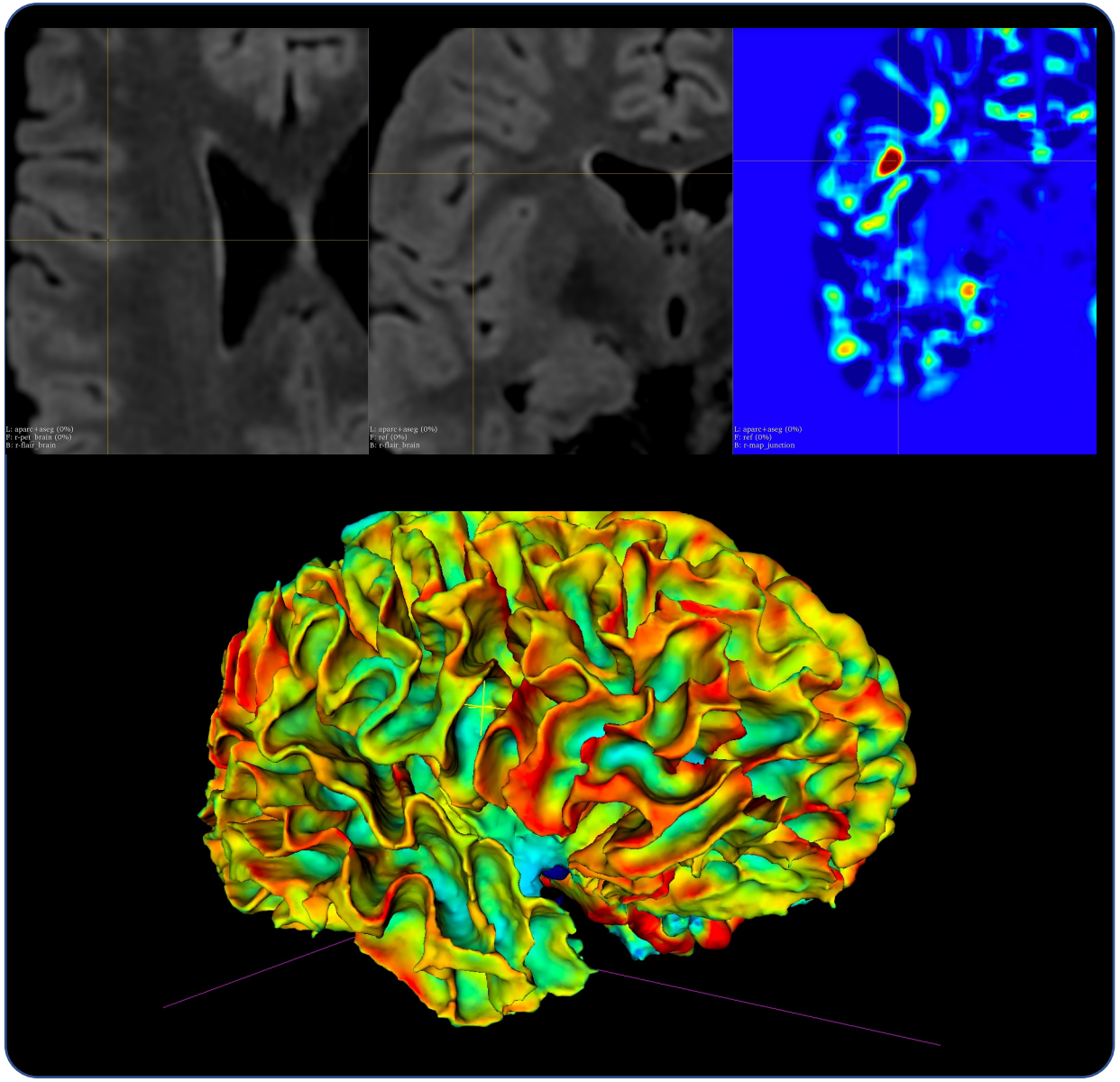
Corteccie premotorie

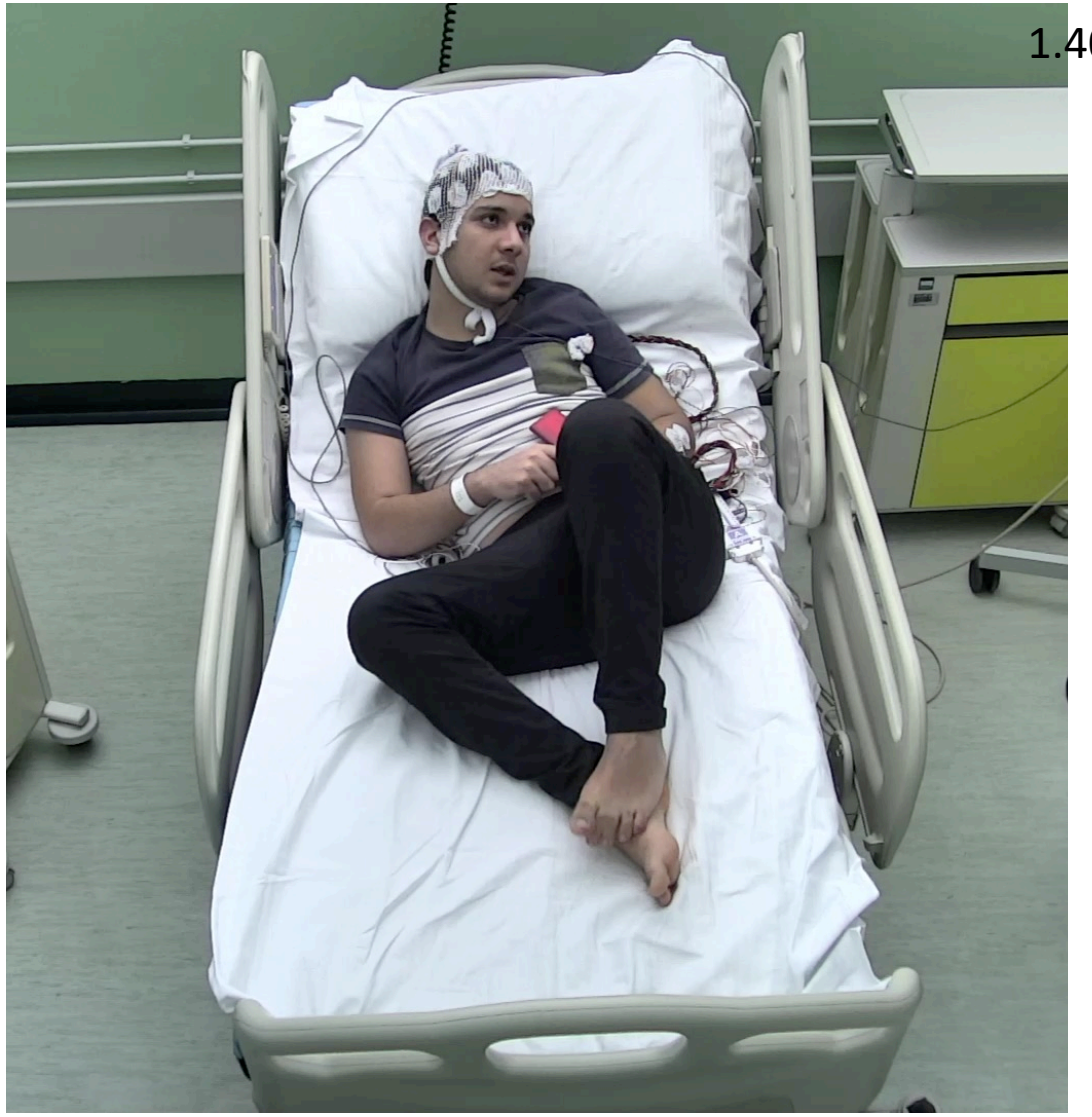
- ✓Età di insorgenza delle crisi: 8-9 aa
- ✓Semeiologia delle crisi:
  - ✓ senso di tensione e dispercezione dell'arto superiore sinistro; irrigidimento AA di sinistra. Possono seguire clonie. Contatto preservato.

Frequenza: quotidiana; sia in veglia che in sonno

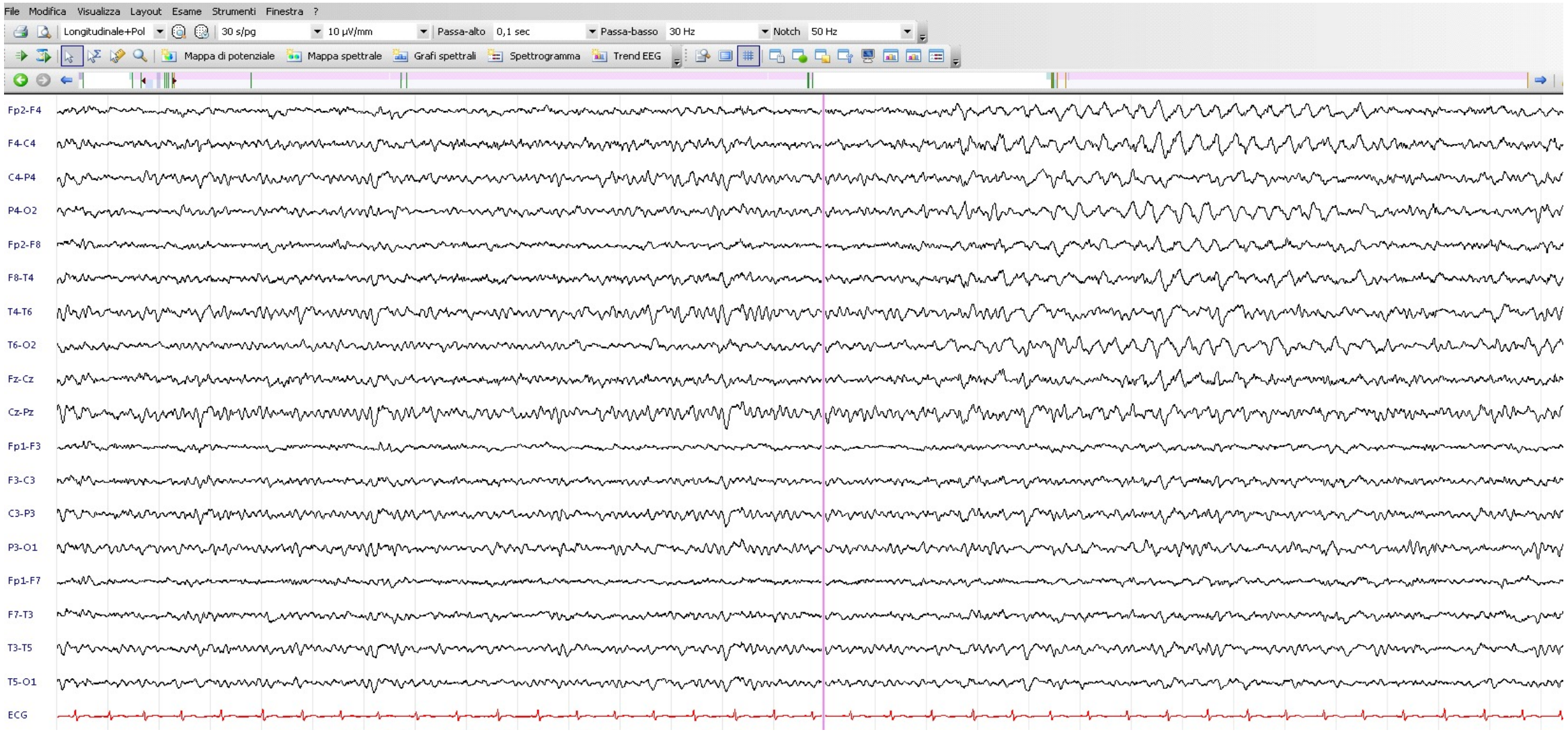


Corteccie premotorie: *tonic posturing*

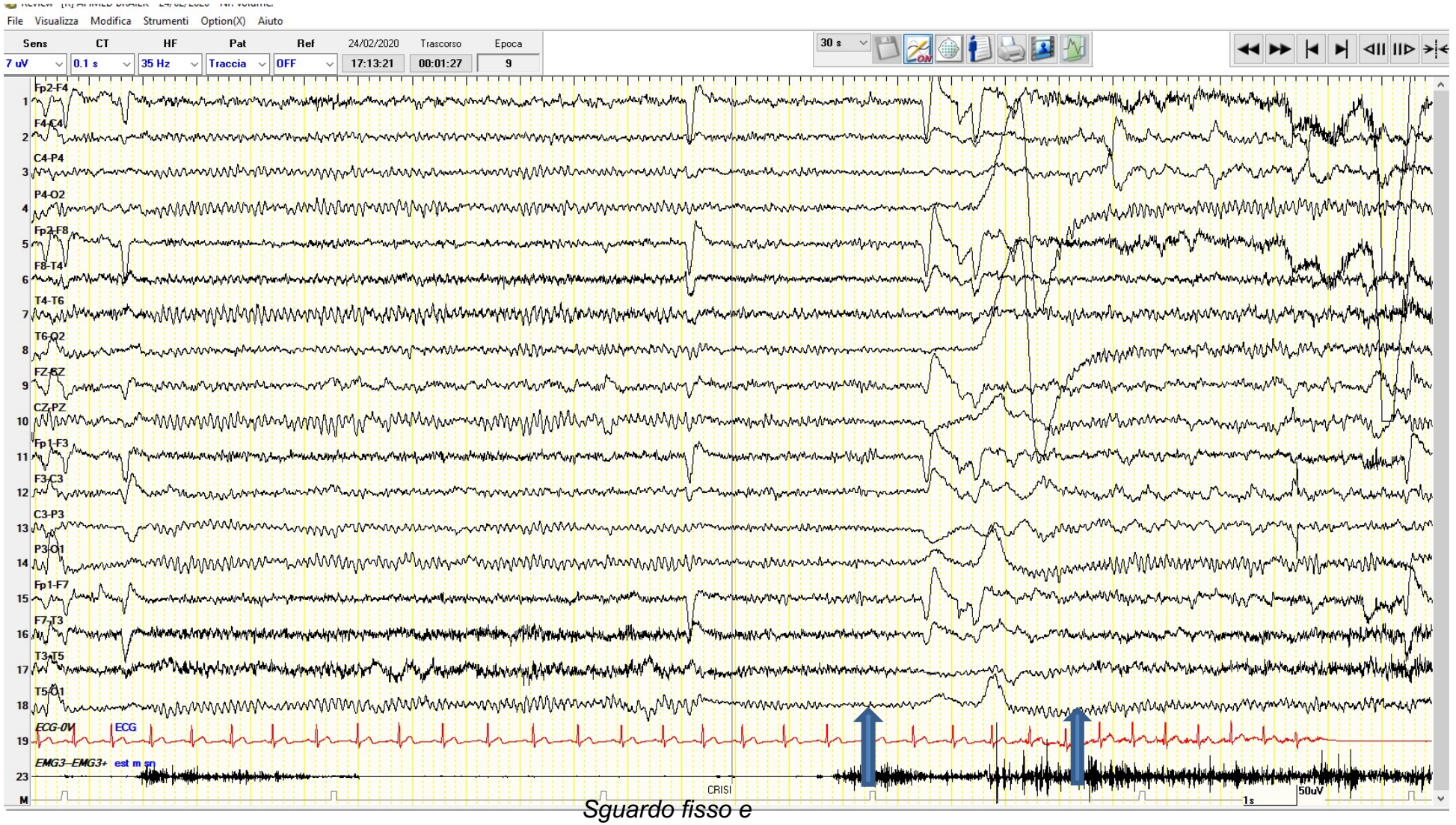




EEG intercritico



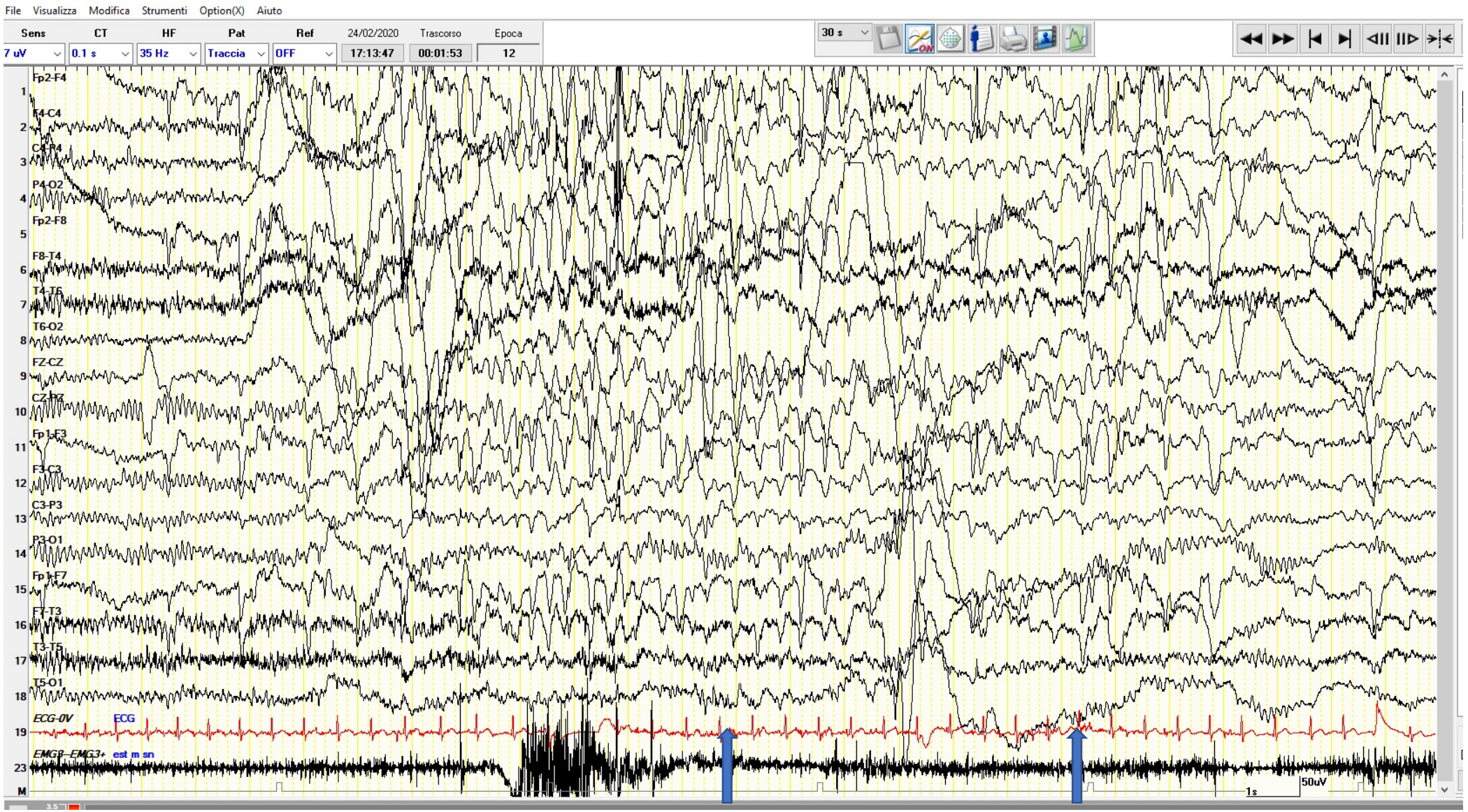
EEG



Sguardo fisso e
muove la mano sx come se sentisse fastidio

Inizio distonia

EEG



Dice di sentire il TNFP

Stringe solo con la mano dx

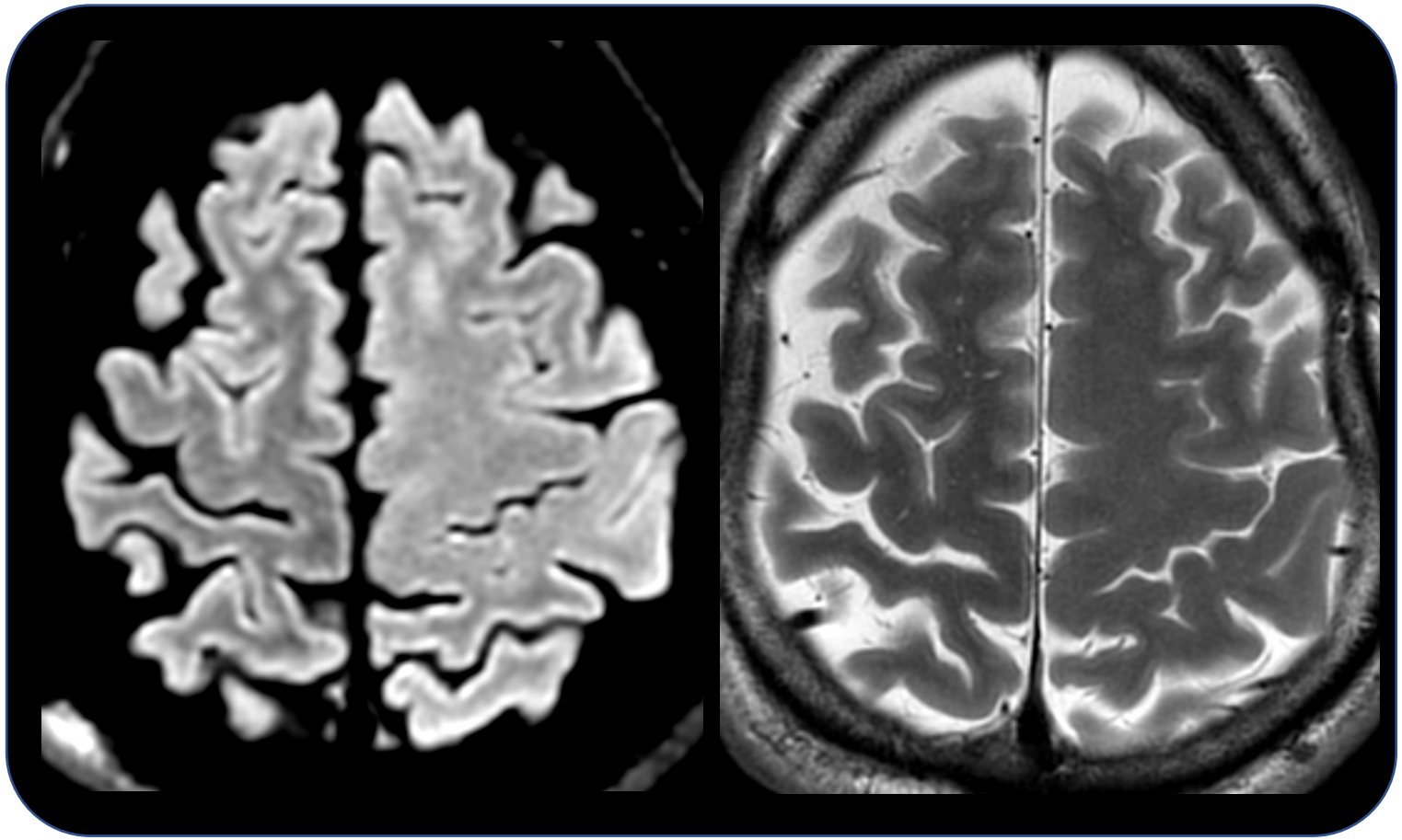
EEG

Parla e risponde correttamente

Corteccie premotorie

- ✓Età di insorgenza delle crisi: 9 aa
- ✓Semeiologia delle crisi:
  - ✓ crisi emitoniche
  - ✓ crisi con versione capo e sguardo verso destra, alterazione della consapevolezza; possibili cadute

Frequenza: quotidiane; sia in veglia che in sonno

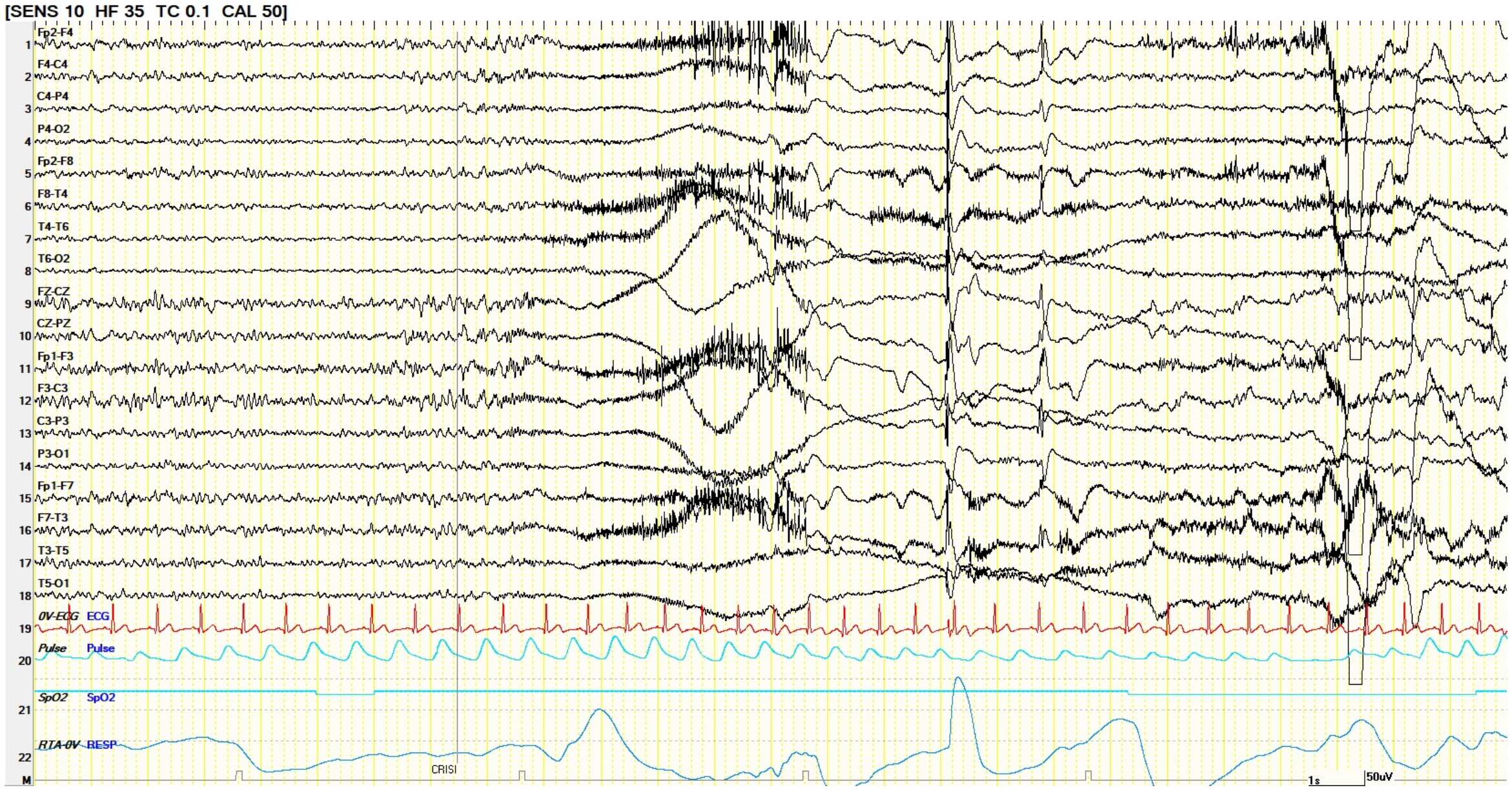


Corteccie premotorie

0.59’’

1.03’’

EEG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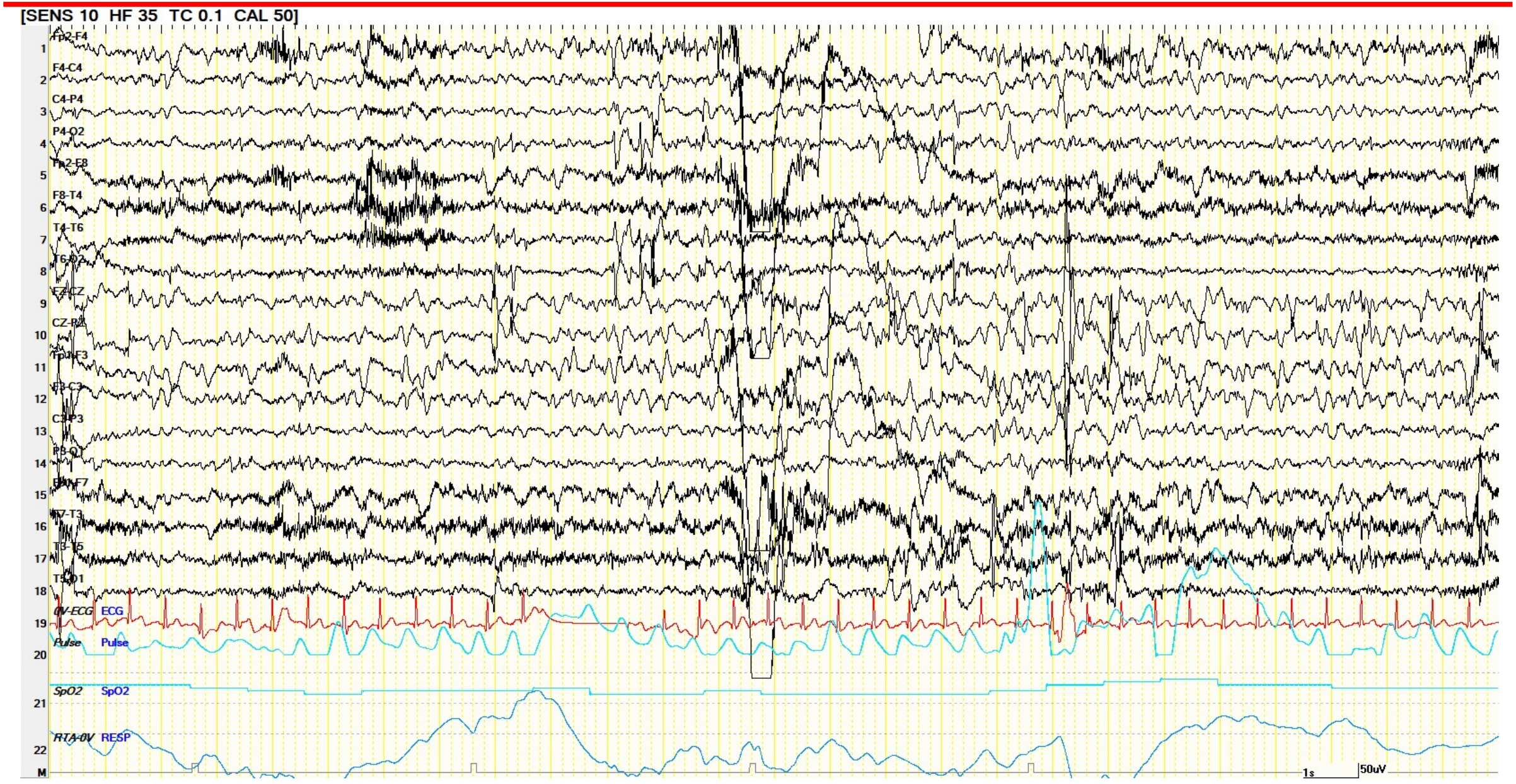
1 Fp2-F4
2 F4-C4
3 C4-P4
4 P4-O2
5 Fp2-F8
6 F8-T4
7 T4-T6
8 T6-O2
9 FZ-CZ
10 CZ-PZ
11 Fp1-F3
12 F3-C3
13 C3-P3
14 P3-O1
15 Fp1-F7
16 F7-T3
17 T3-T5
18 T5-O1
19 0V-ECG ECG
20 Pulse Pulse
21 SpO2 SpO2
22 RTA-0V RESP
M
CRISI
1s
50uV

EEG


[SENS 10 HF 35 TC 0.1 CAL 50]
Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
FZ-CZ
CZ-PZ
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
OV-ECG ECG
Pulse Pulse
SpO2 SpO2
RTA-0V RESP
1s
50uV

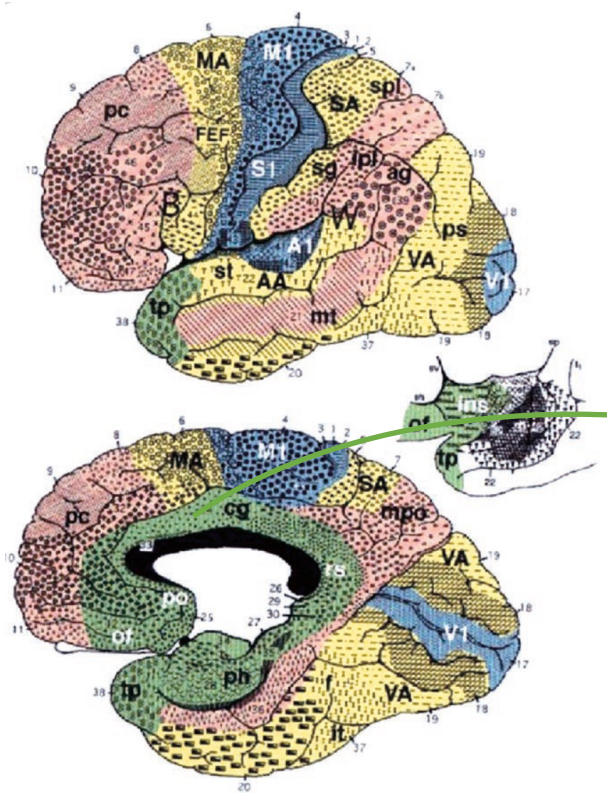
EEG


[SENS 10 HF 35 TC 0.1 CAL 50]
1 Fp2-F4
2 F4-C4
3 C4-P4
4 P4-O2
5 Fp2-F8
6 F8-T4
7 T4-T6
8 T6-O2
9 FZ-CZ
10 CZ-PZ
11 Fp1-F3
12 F3-C3
13 C3-P3
14 P3-O1
15 Fp1-F7
16 F7-T3
17 T3-T5
18 T5-O1
19 0V-ECG ECG
20 Pulse Pulse
21 SpO2 SpO2
22 RTA-0V RESP
M
1s
50uV

EEG


[SENS 10 HF 30 TC 0.1 CAL 50]
1 Fp2-F4
2 F4-C4
3 C4-P4
4 P4-O2
5 Fp2-F8
6 F8-T4
7 T4-T6
8 T6-O2
9 FZ-CZ
10 CZ-PZ
11 Fp1-F3
12 F3-C3
13 C3-P3
14 P3-O1
15 Fp1-F7
16 F7-T3
17 T3-T5
18 T5-O1
19 0V-ECG ECG
20 Pulse Pulse
21 SpO2 SpO2
22 RTA-0V RESP
M
CRISI
1s
50uV

M & EEG - *localizzazione*



Emotion
Automatism
Hyperkinteic

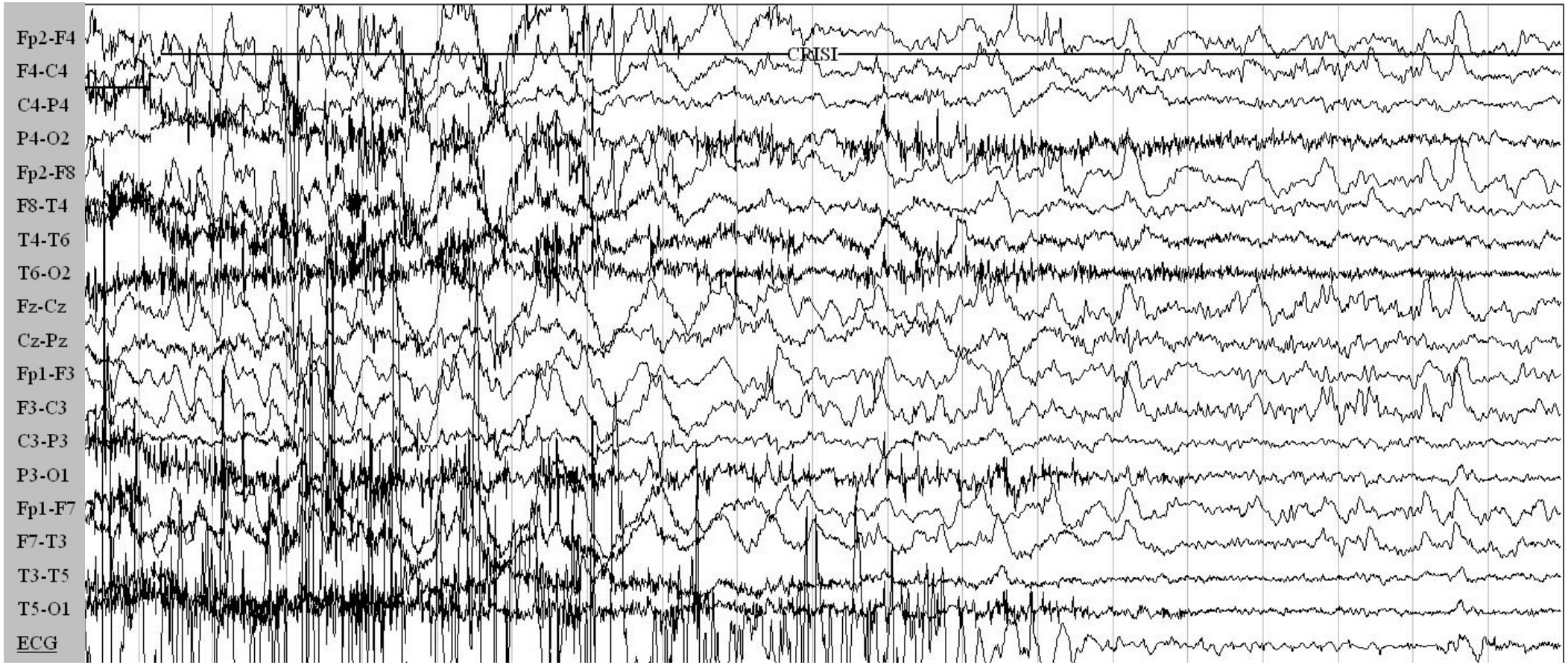
Corteccia del cingolo: SHE

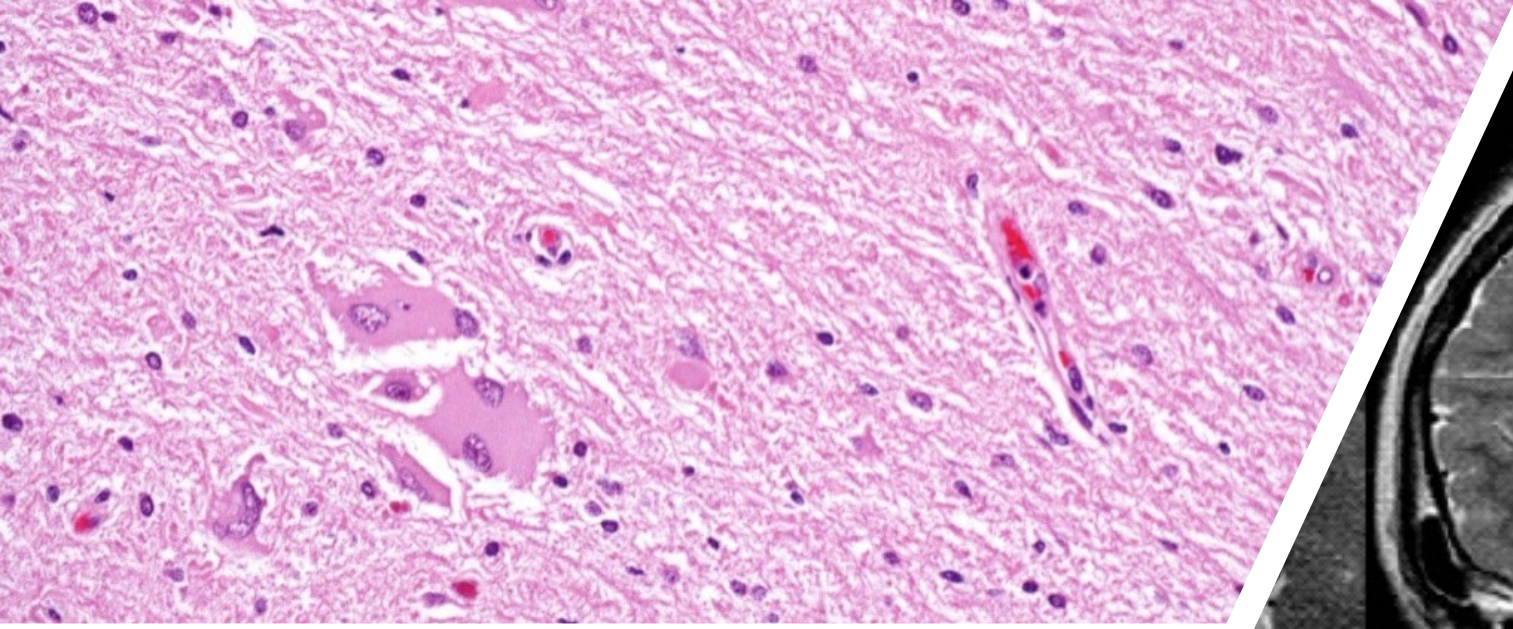
Semiology: Sleep-related Hypermotor Seizures

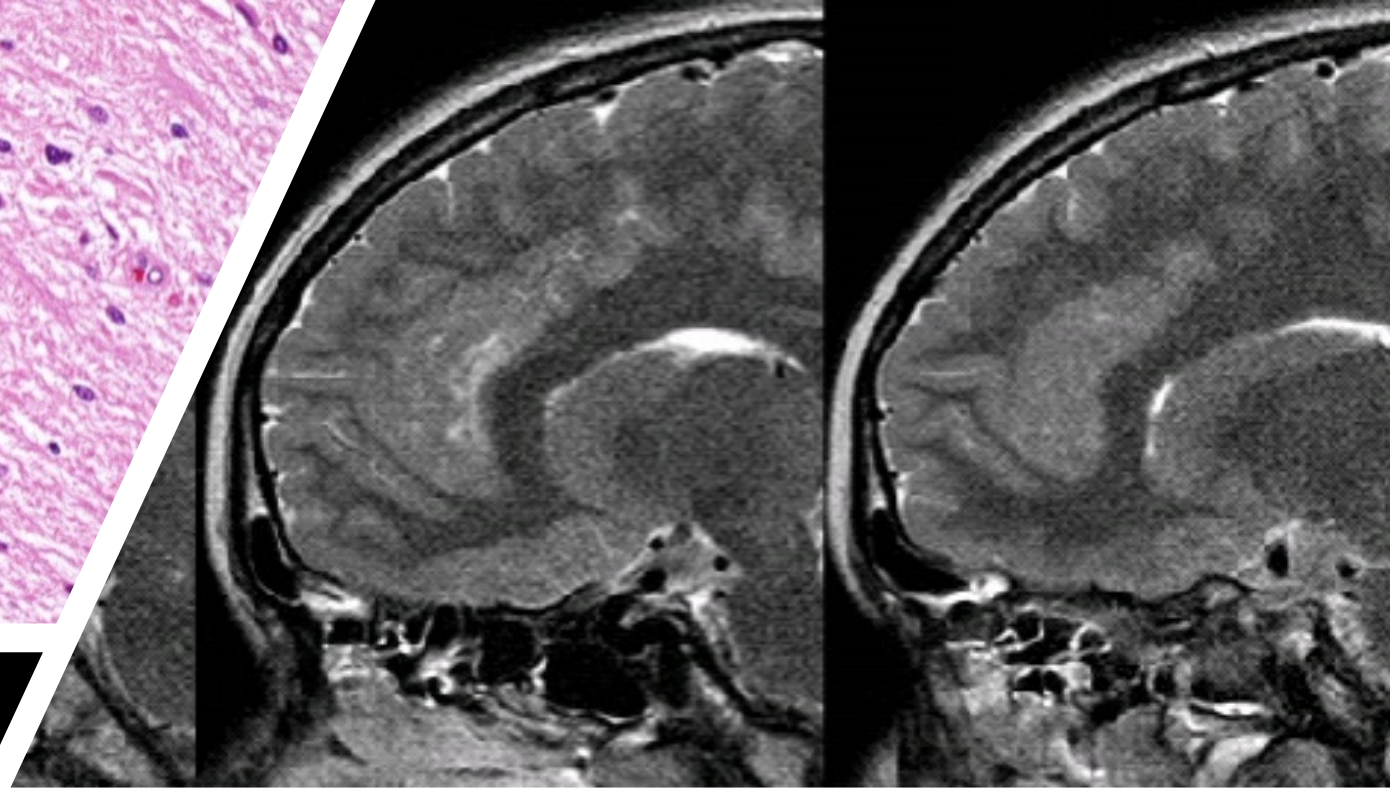
-Sudden onset from sleep
-Facial expression of fear, marked anxiety, vocalizations
-Hyperkinetic movements :
cycling
fishing

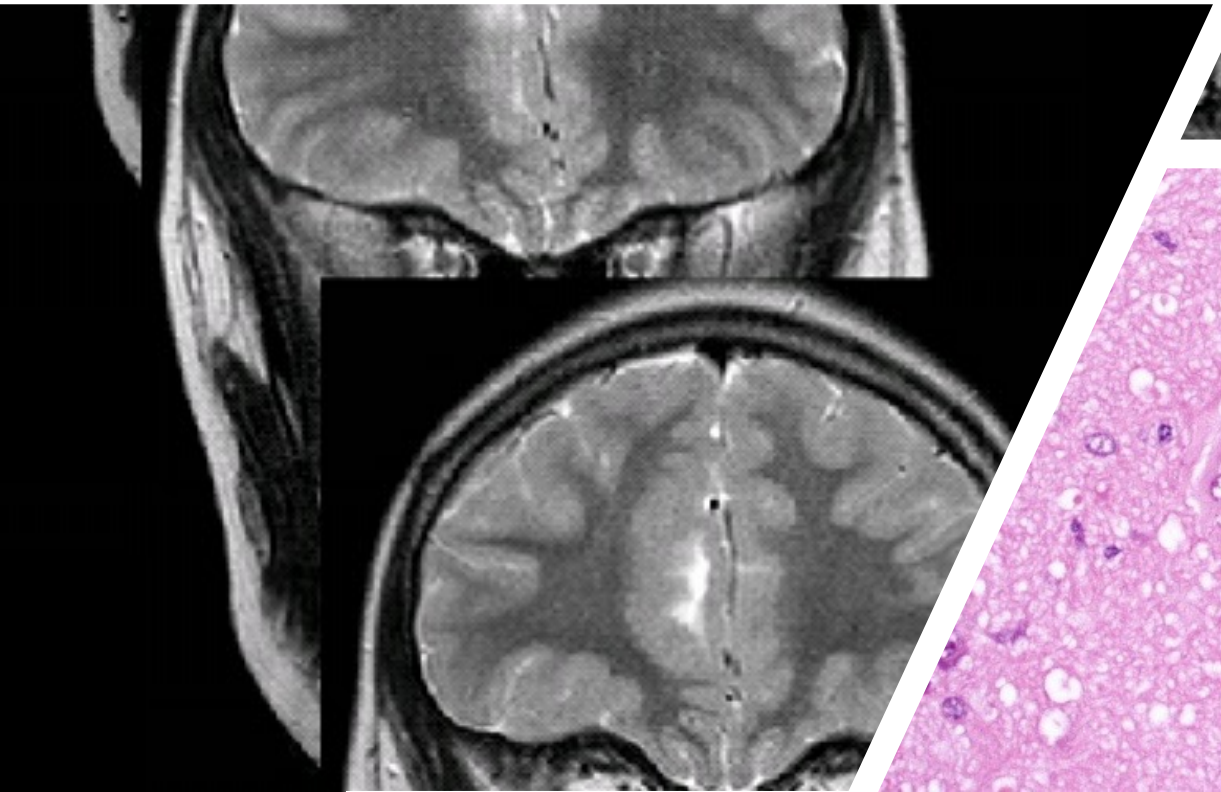
-Figure 4 sign (left leg extended, right leg flexed)

EEG


Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
Fz-Cz
Cz-Pz
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
ECG
CPISI



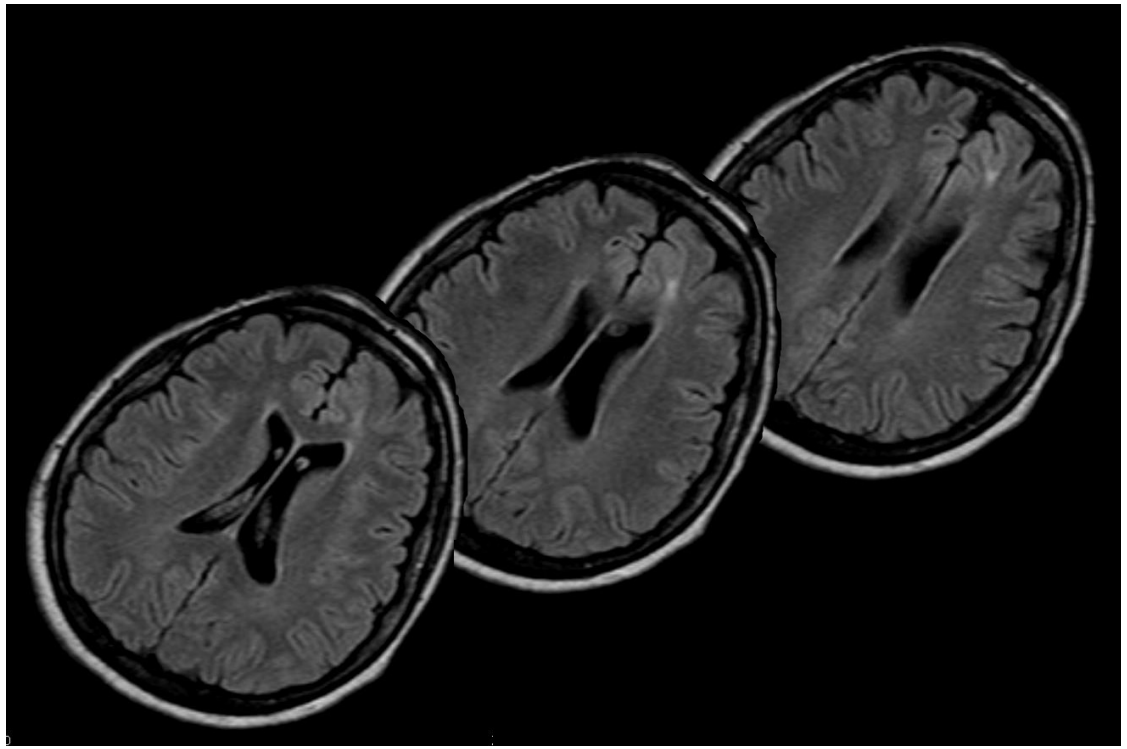




Follow-up a 48 mesi:

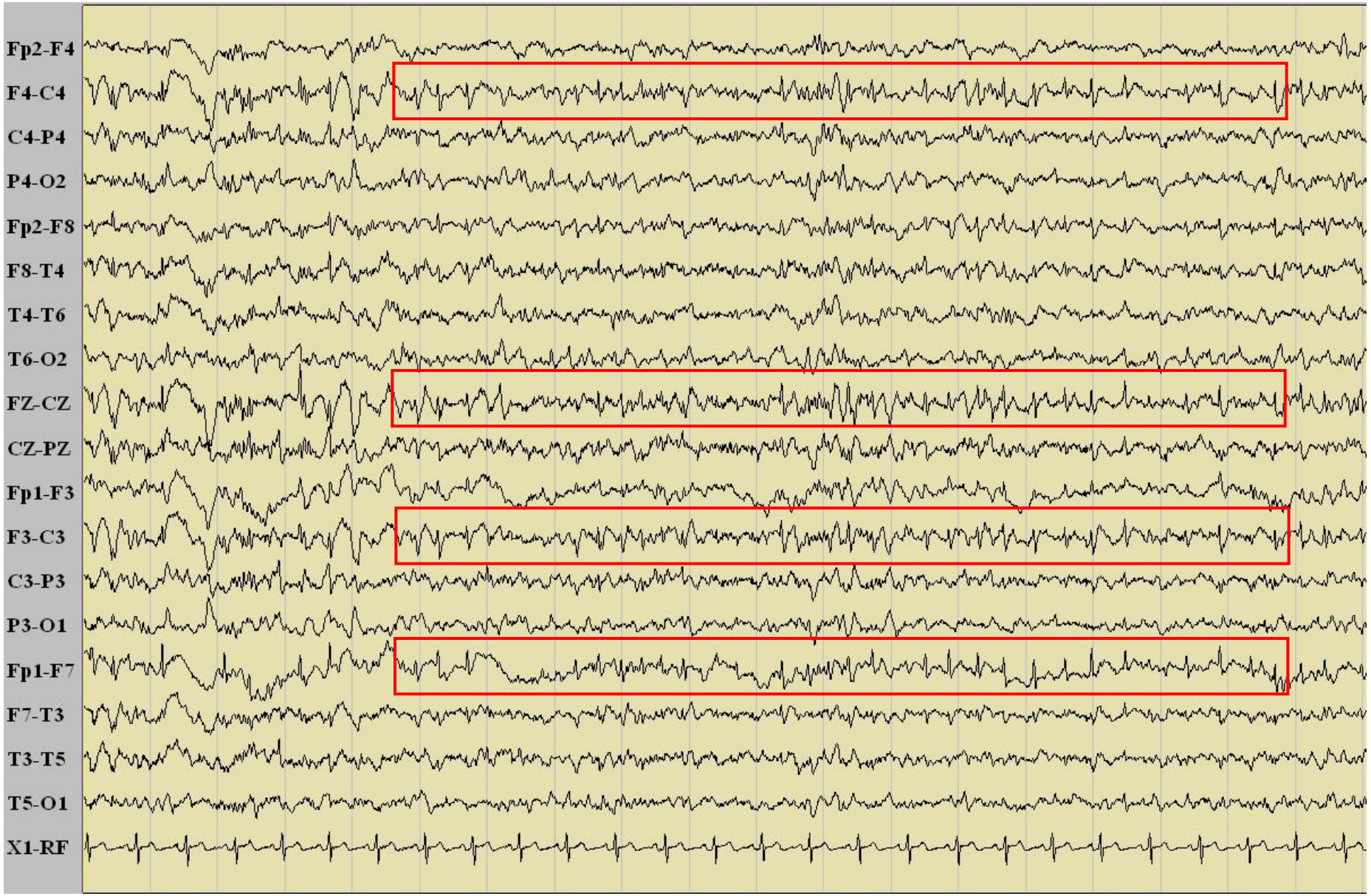
- Nessuna recidiva di crisi

Corteccia del cingolo: SHE

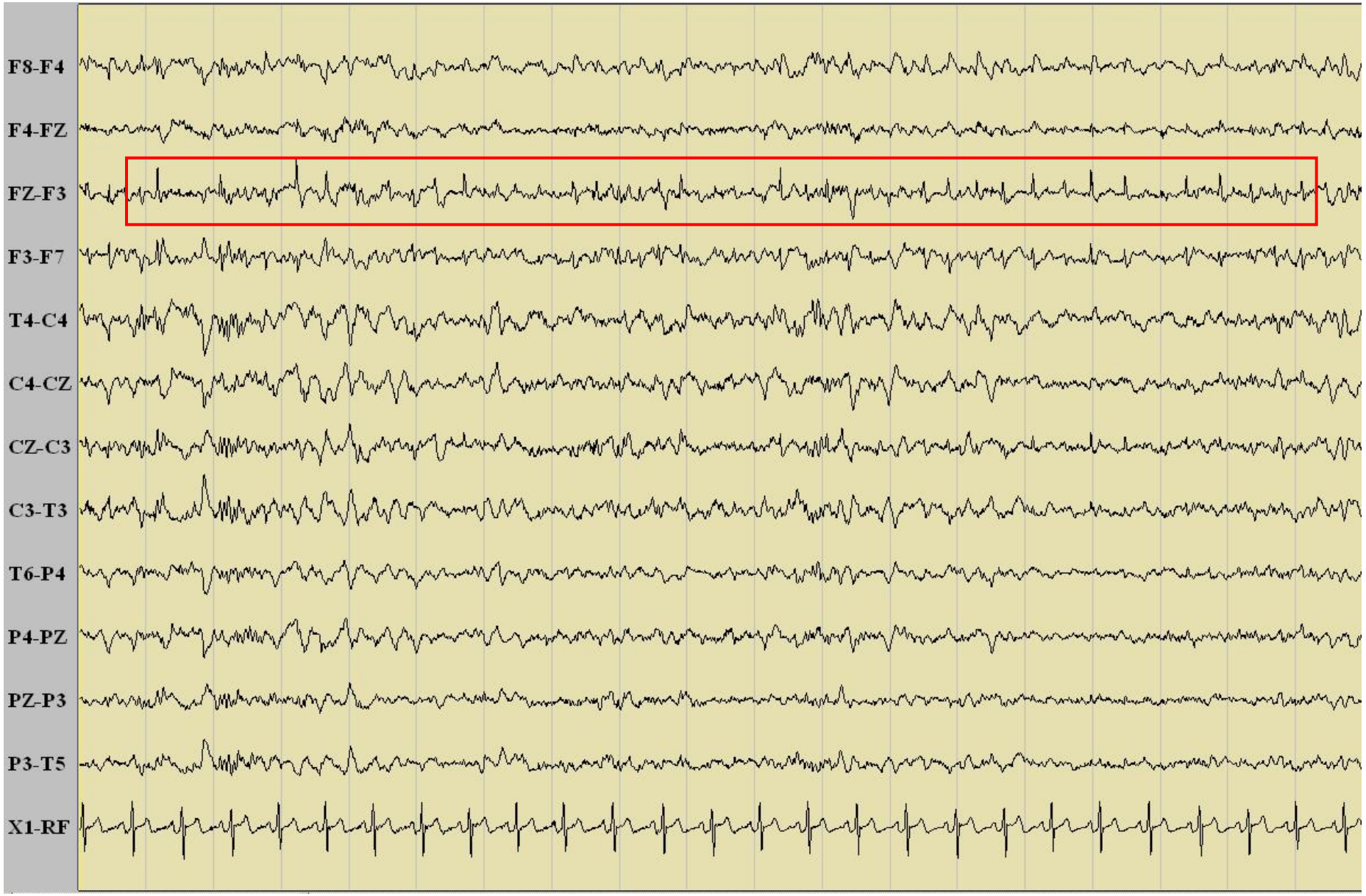


- ✓ Esordio nell' infanzia (all'età di 8-9anni) di episodi notturni caratterizzati da espressione di paura, gemiti o pianto. Non contatto. La paziente tende a "rigirarsi" nel letto e ad accovacciarsi. Rapida ripresa del contatto.
- ✓ Rare crisi convulsive.
- ✓ Crisi sempre legate al sonno. Eccezionalmente in veglia.
- ✓ Frequenza: plurisettimanale. Negli anni ha presentato anche periodi brevi riferiti senza crisi.

EEG intercritico



EEG intercritico (trasversale)



EEG crisi

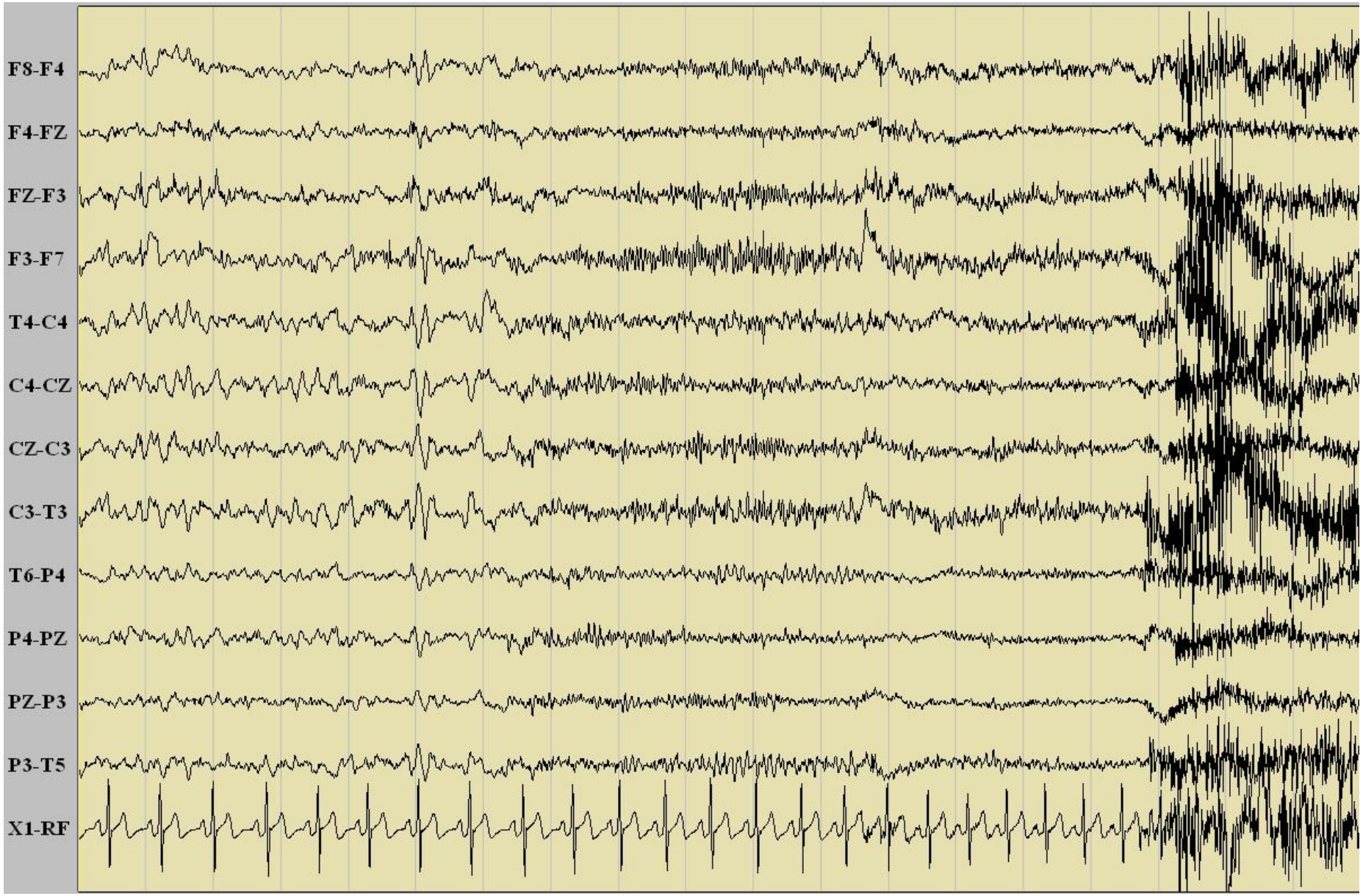

Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
FZ-CZ
CZ-PZ
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
X1-RF

EEG crisi (trasvesale)

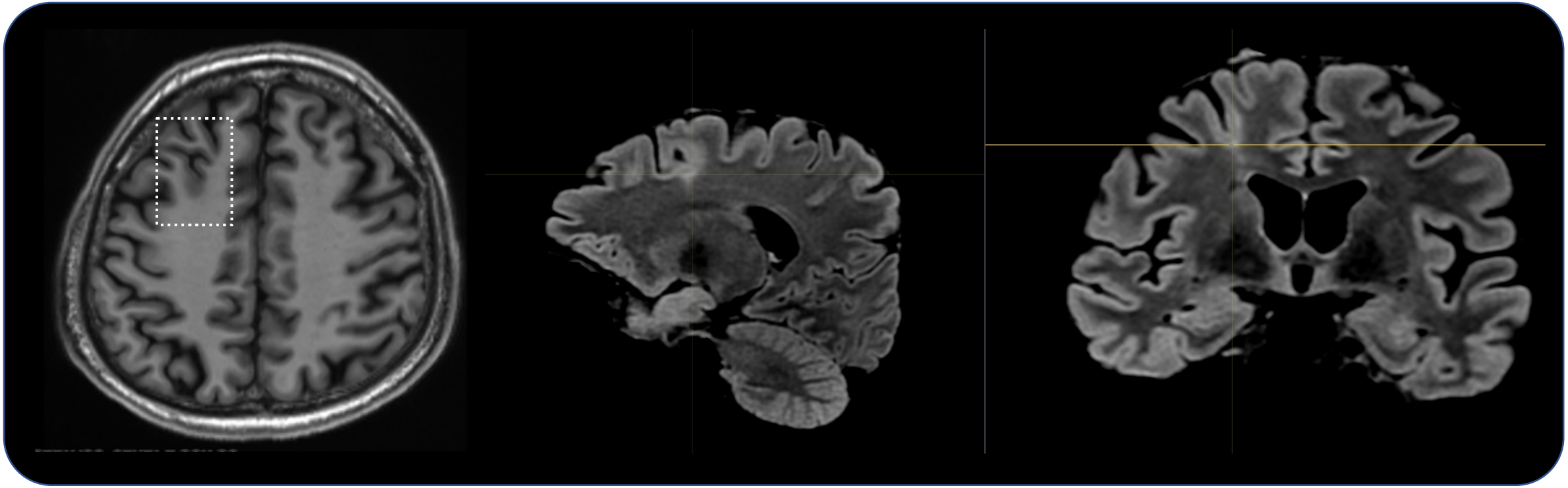
Cortectomia della lesione

FCD type II

Seizure-free a 10 anni



Corteccia prefrontale: “hyper – gelastic”



Semiology: Sleep-related Hypermotor Seizures

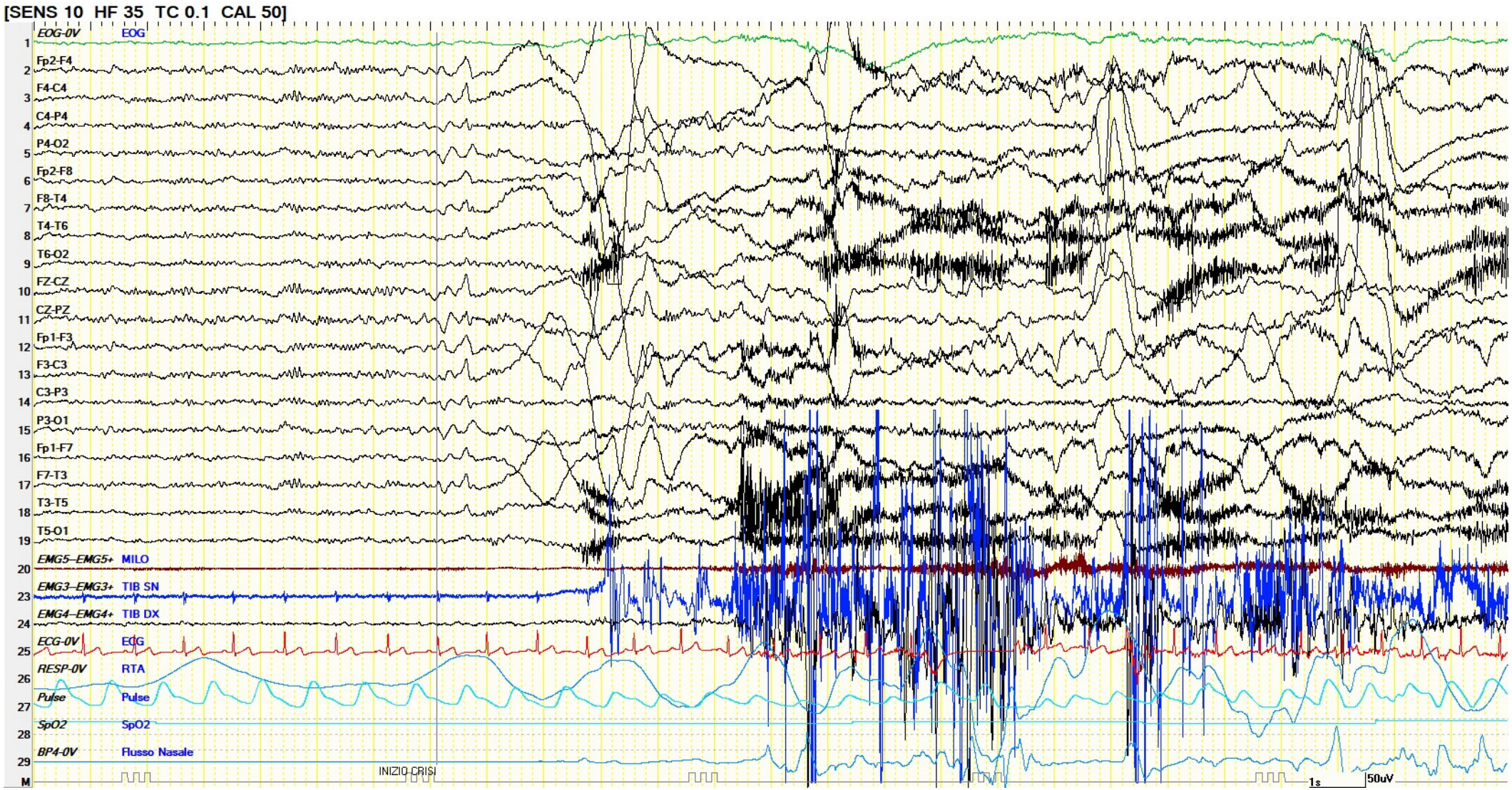
-Sudden onset from sleep
-Change in facial expression, vocalizations
-Hyperkinetic movements + forced laugh

Corteccia prefrontale: “hyper – gelastic”

1.30’

0.15’

EEG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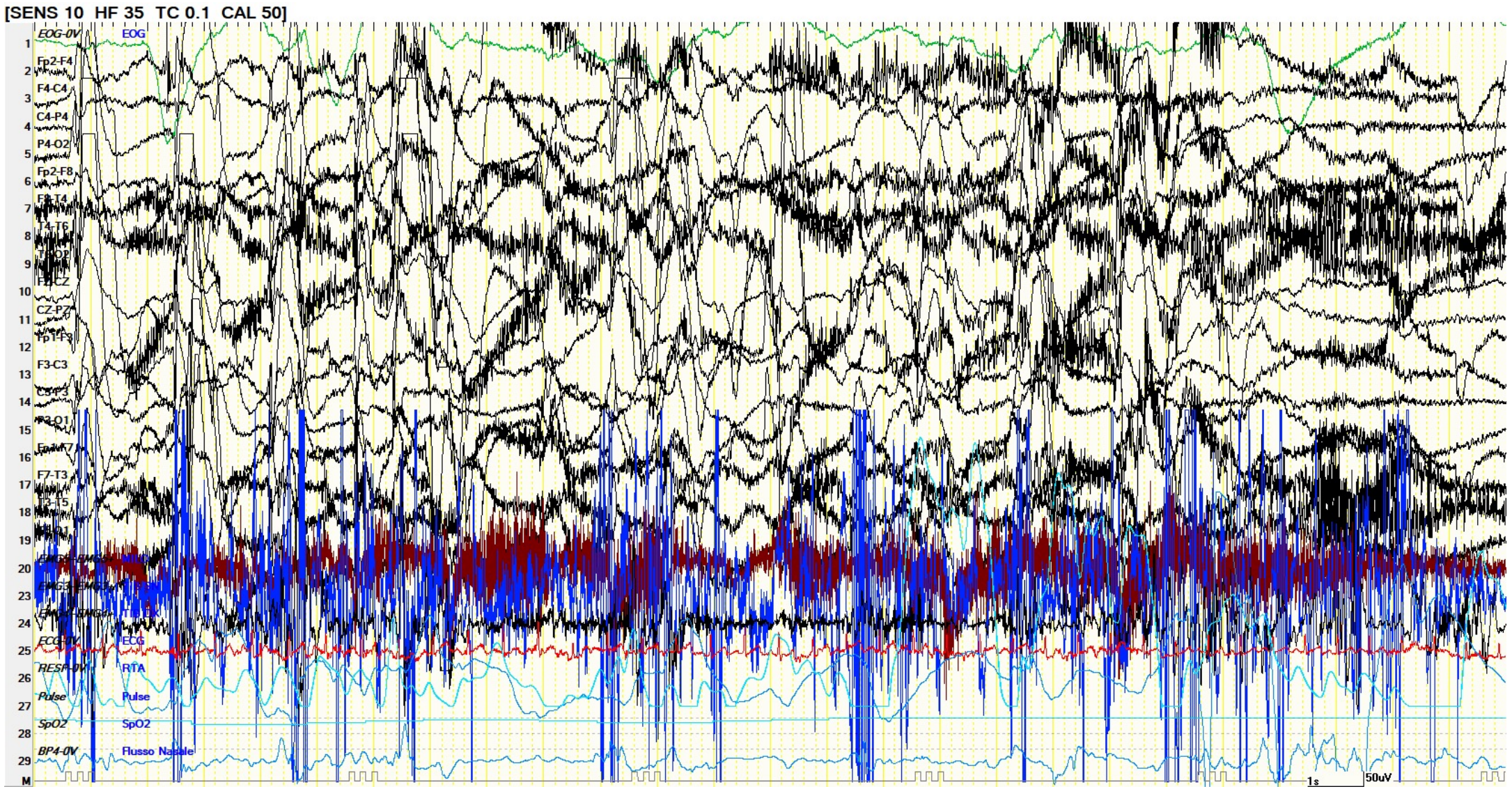
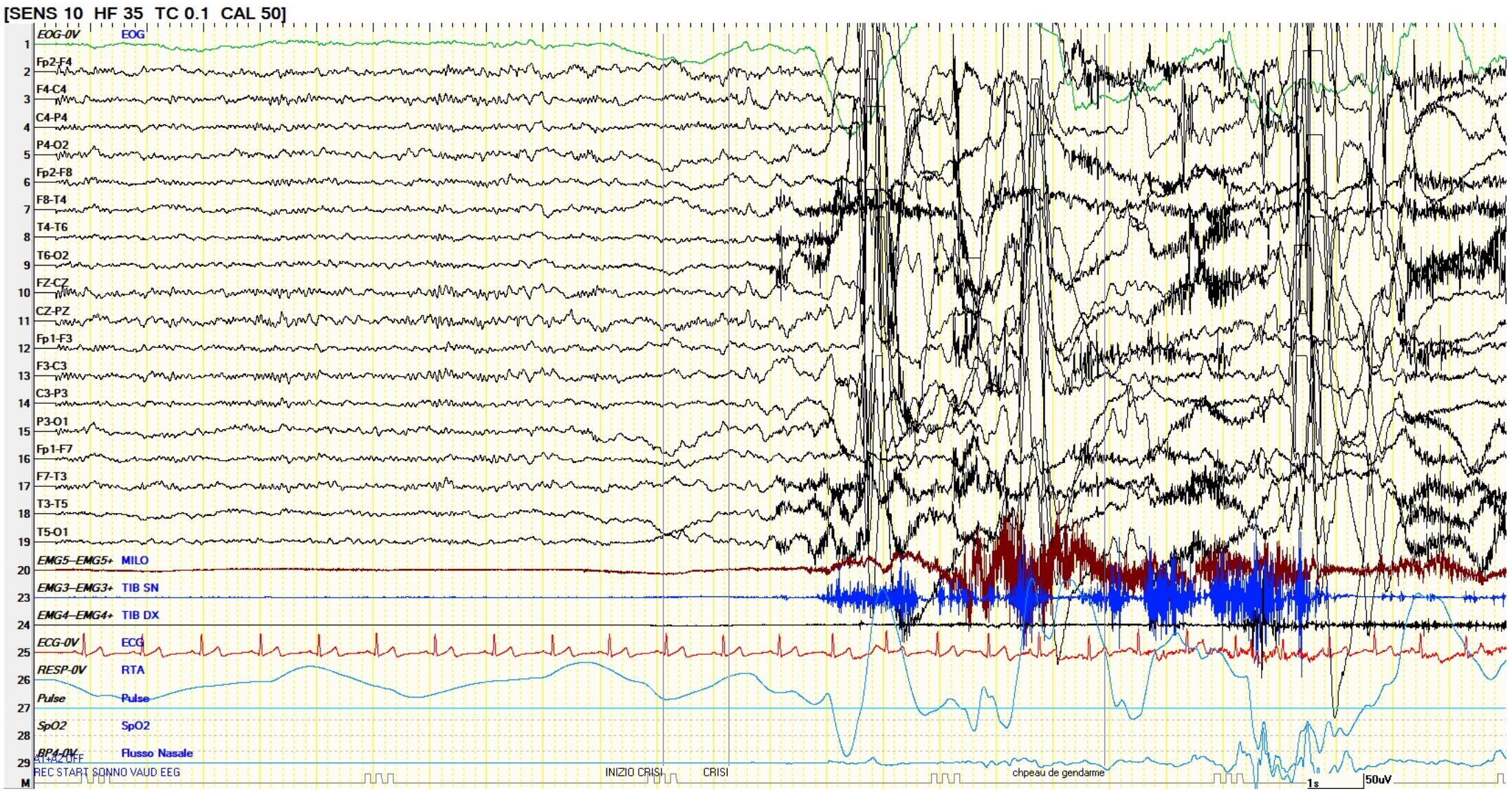
EOG-0V EOG
Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
FZ-CZ
CZ-PZ
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
EMG5–EMG5+ MILO
EMG3–EMG3+ TIB SN
EMG4–EMG4+ TIB DX
ECG-0V ECG
RESP-0V RTA
Pulse Pulse
SpO2 SpO2
BP4-0V Flusso Nasale
INIZIO CRISI
1s
50uV

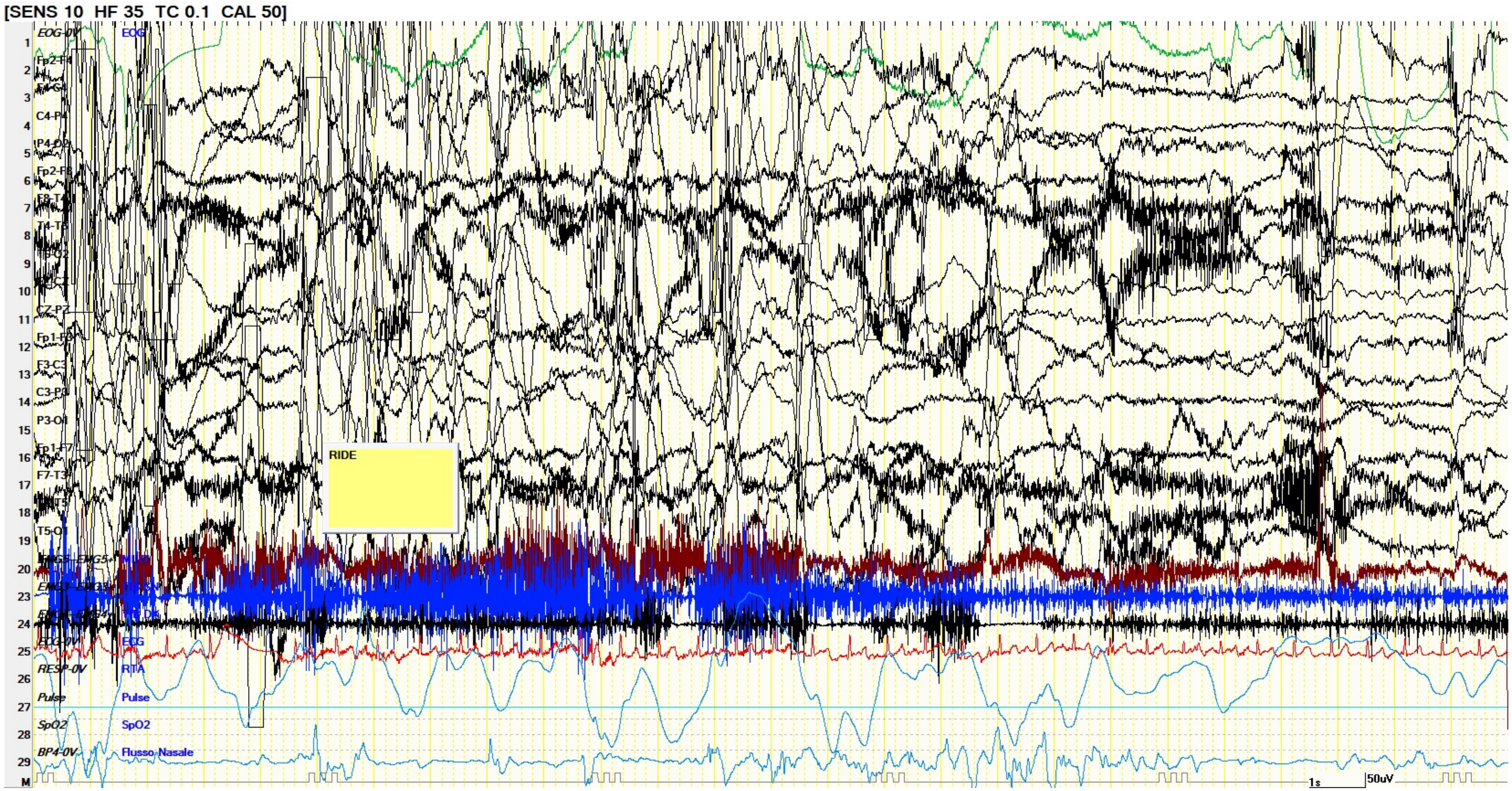
EEG


[SENS 10 HF 35 TC 0.1 CAL 50]
EOG-0V
EOG
Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
Fp1-F3
CZ-PZ
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
ECG-0V
ECG
RESP-0V
RTA
Pulse
Pulse
SpO2
SpO2
BP4-0V
Flusso Nasale
1s
50uV

EEG

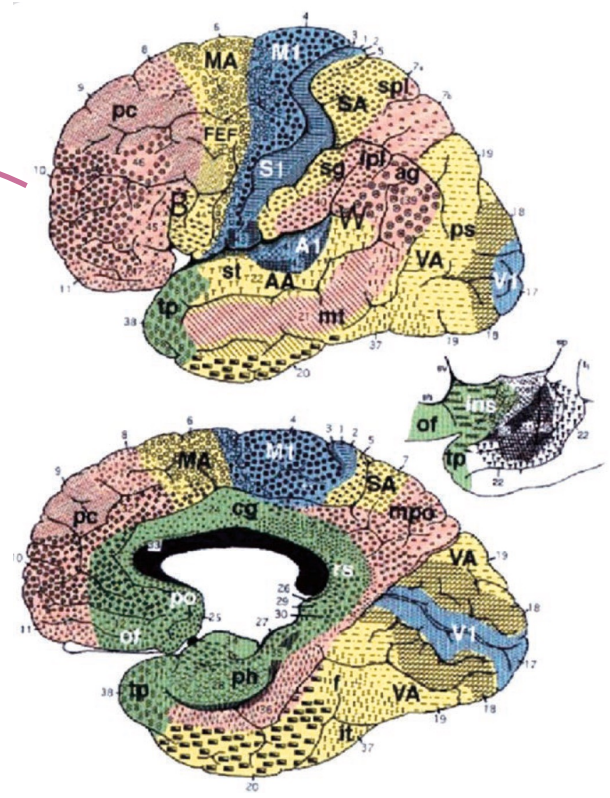

[SENS 10 HF 35 TC 0.1 CAL 50]
EOG-0V EOG
Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
FZ-CZ
CZ-PZ
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
EMG5–EMG5+ MILO
EMG3–EMG3+ TIB SN
EMG4–EMG4+ TIB DX
ECG-0V ECG
RESP-0V RTA
Pulse Pulse
SpO2 SpO2
BP4-0V Flusso Nasale
A1+A2 CUFF
REC START SONNO VAUD EEG
INIZIO CRISI
CRISI
chpeau de gendarme
1s
50uV

EEG


[SENS 10 HF 35 TC 0.1 CAL 50]
EOG-0V
EOG
Fp2-F4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
CZ-P7
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T5-O1
ECG-0V
ECG
RESP-0V
RTA
Pulse
Pulse
SpO2
SpO2
BP4-0V
Flusso Nasale
RIDE
1s
50uV
M

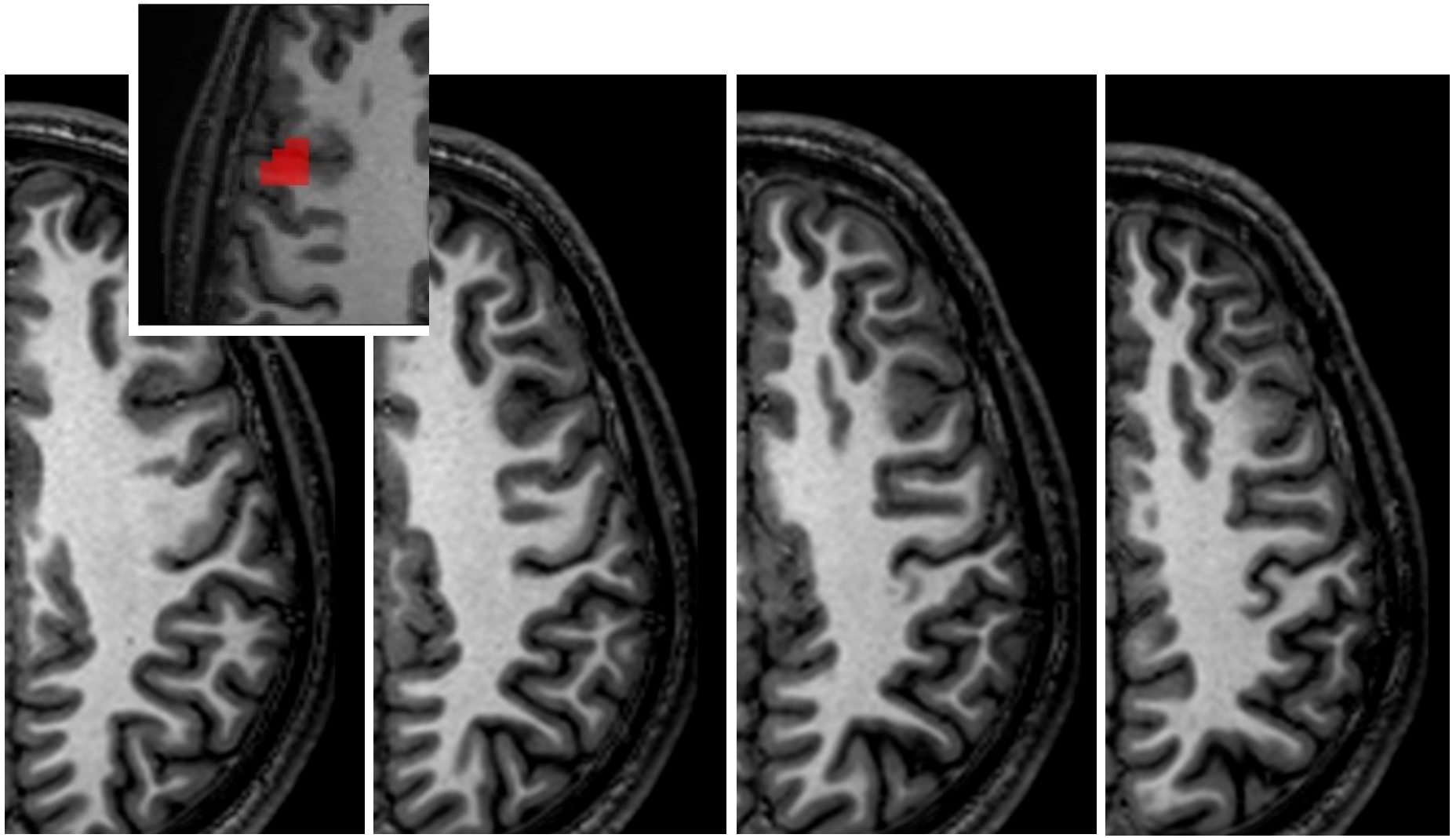
M & EEG - *localizzazione*

Discognitive - infraclinical

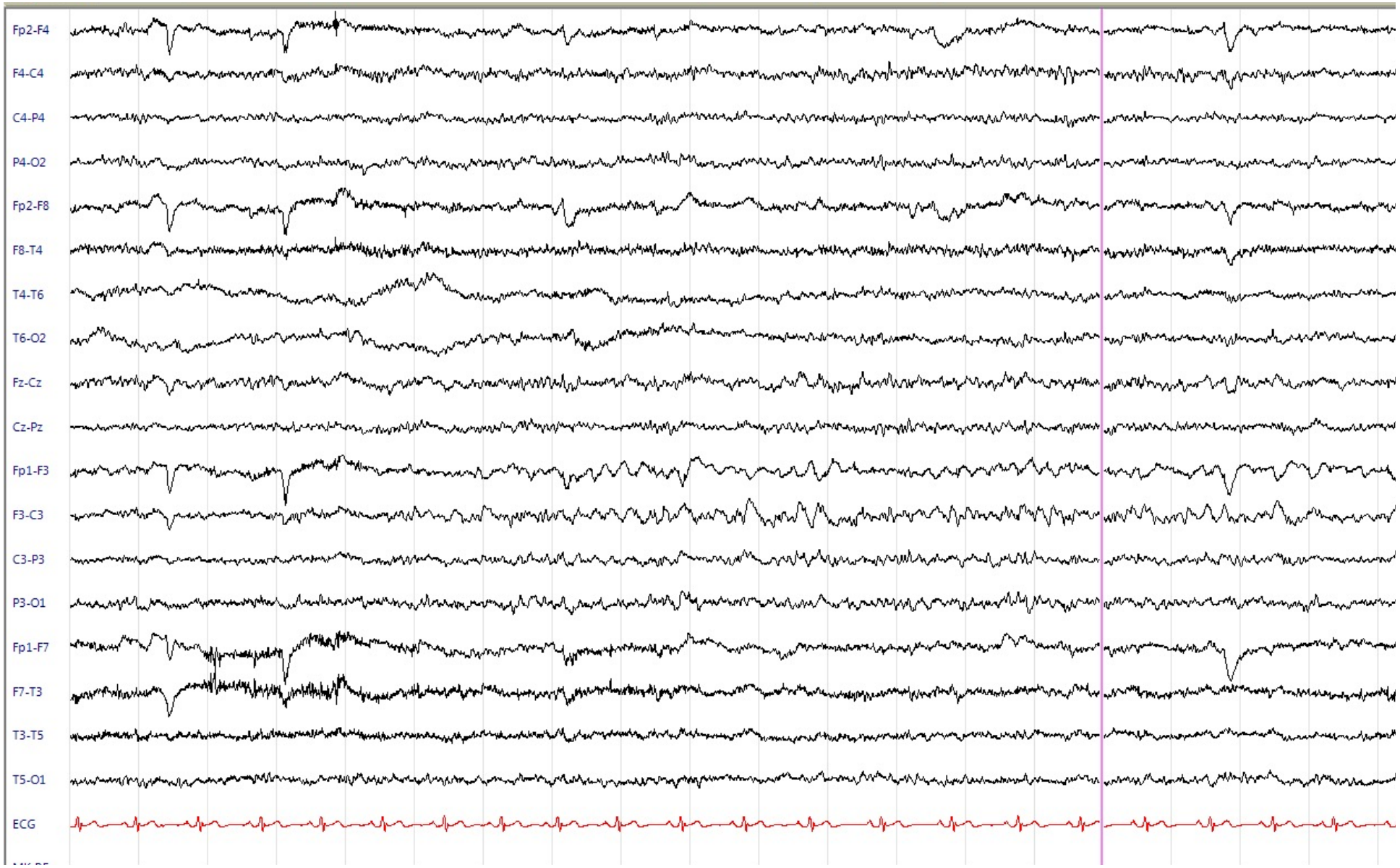


Silent (?) discharges

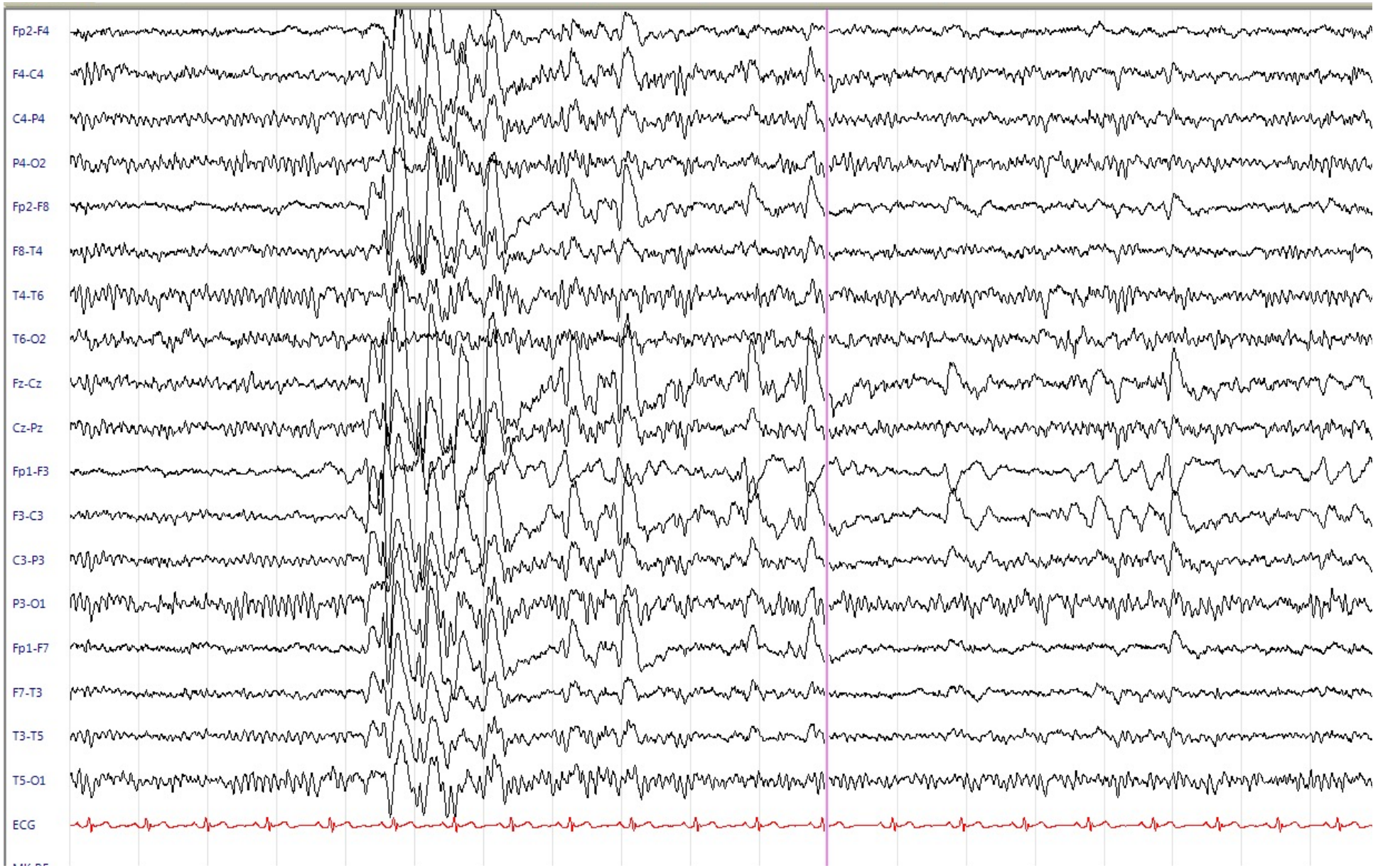
Maschio
16 aa



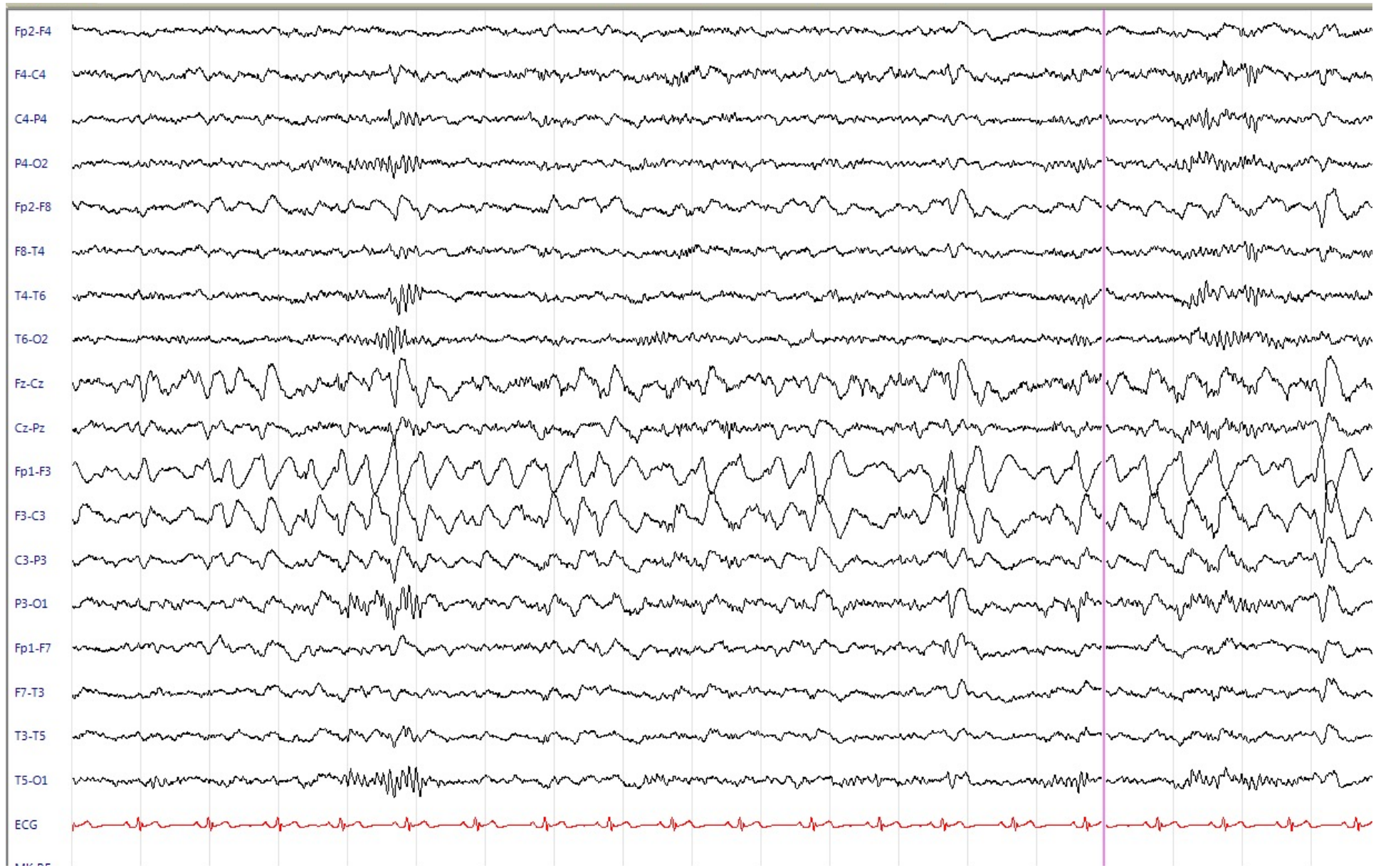
EEG slow waves



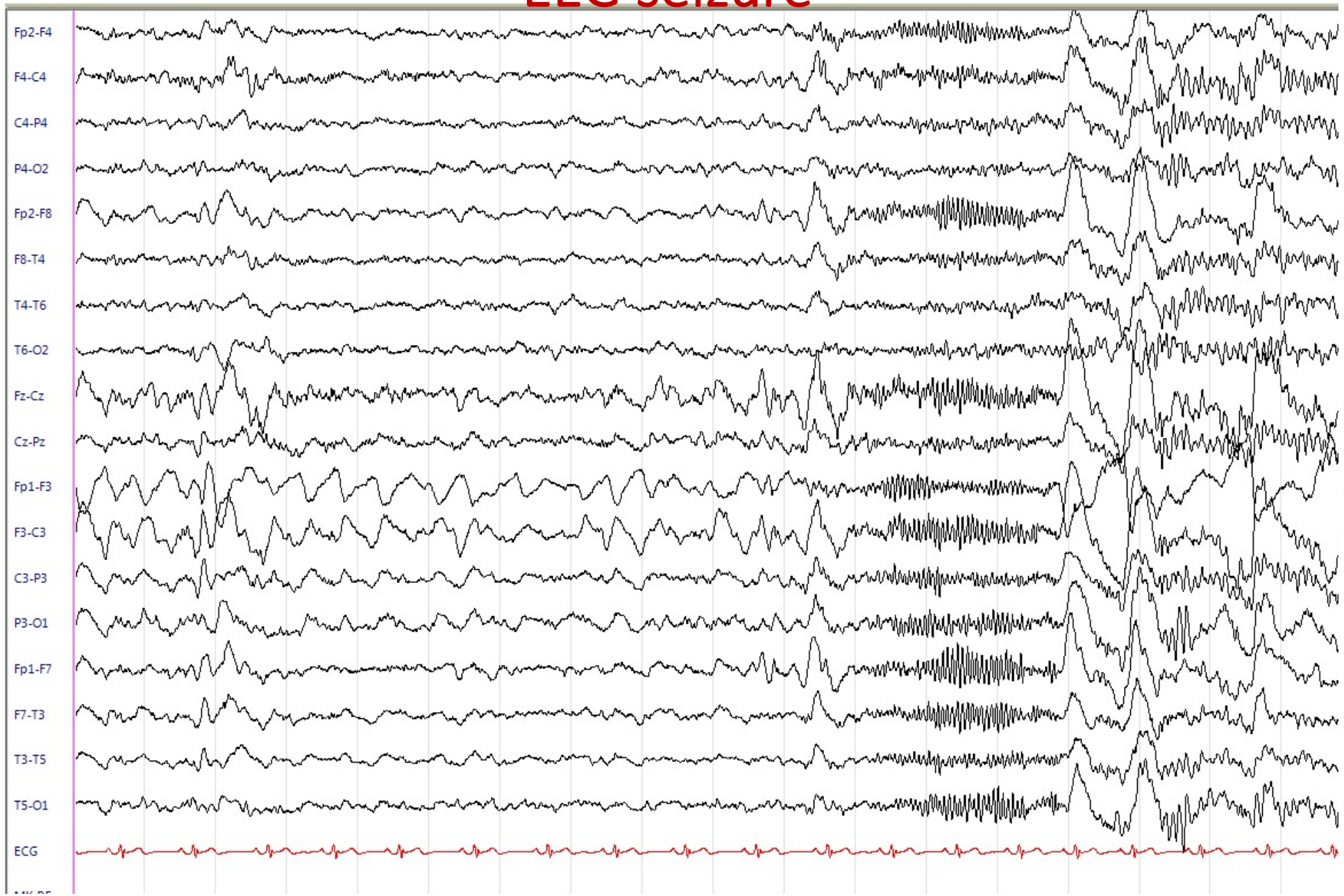
EEG spikes


Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
Fz-Cz
Cz-Pz
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
ECG

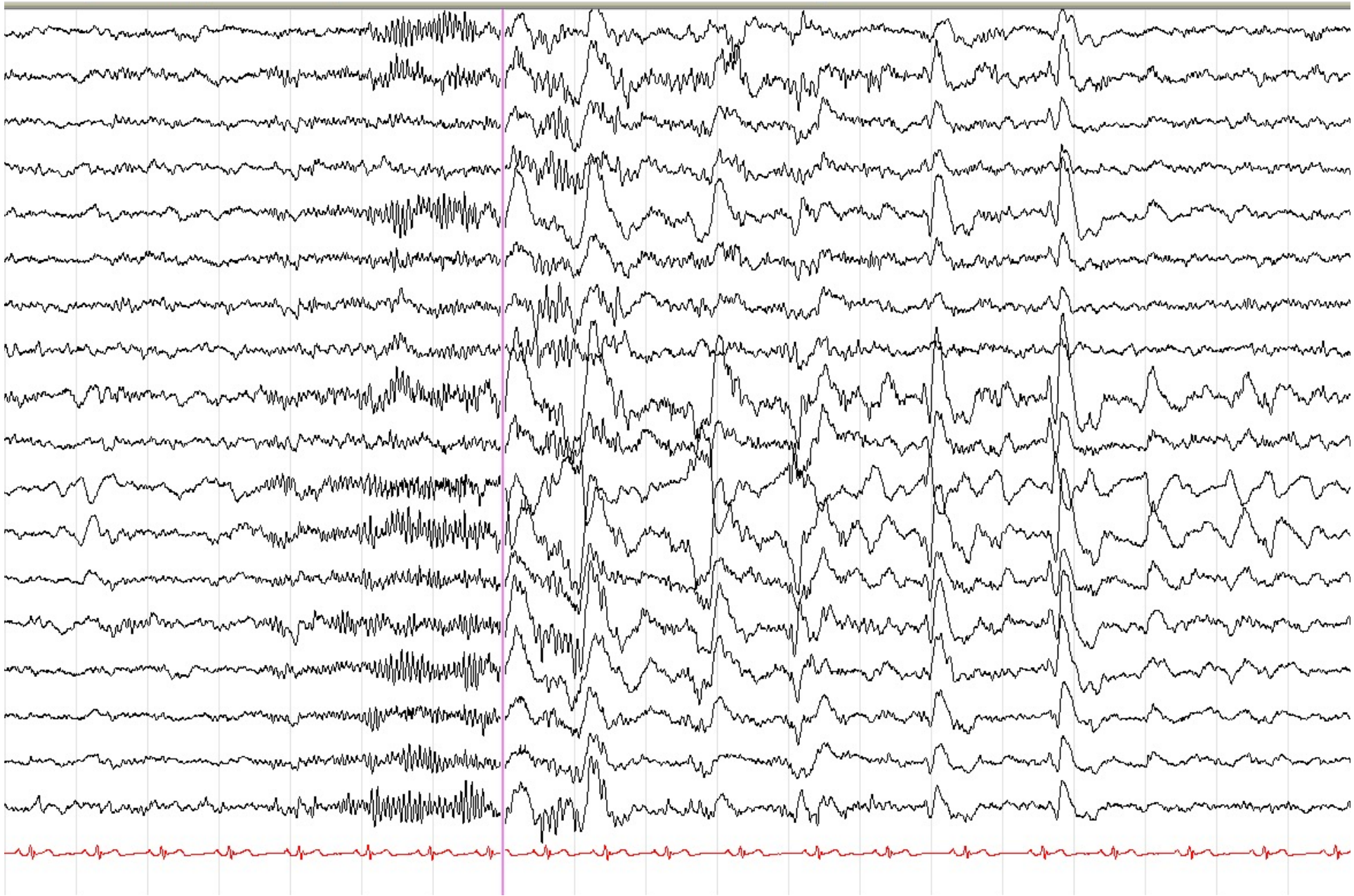
EEG spikes


Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
Fz-Cz
Cz-Pz
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
ECG

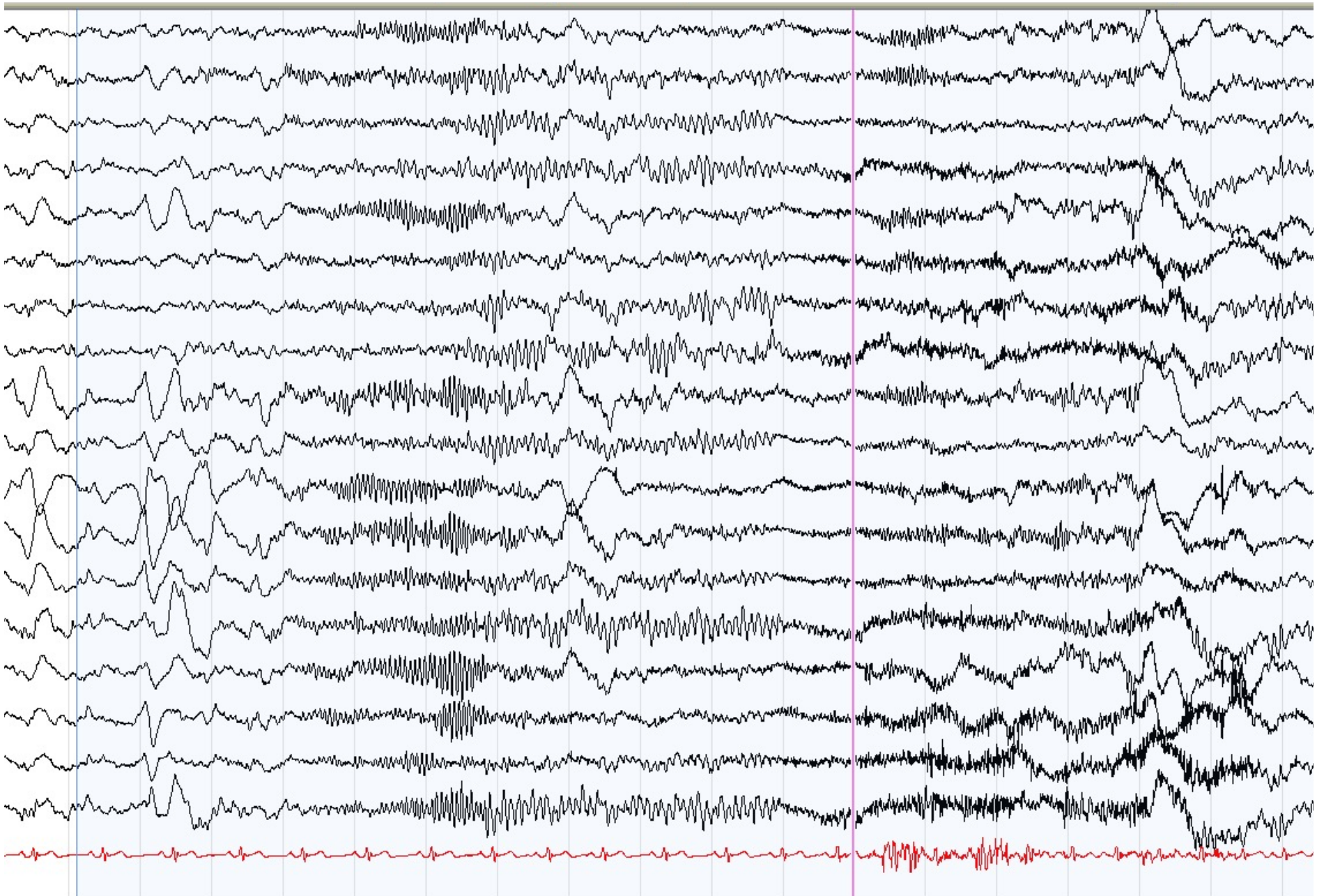
EEG seizure


Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
Fz-Cz
Cz-Pz
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
ECG

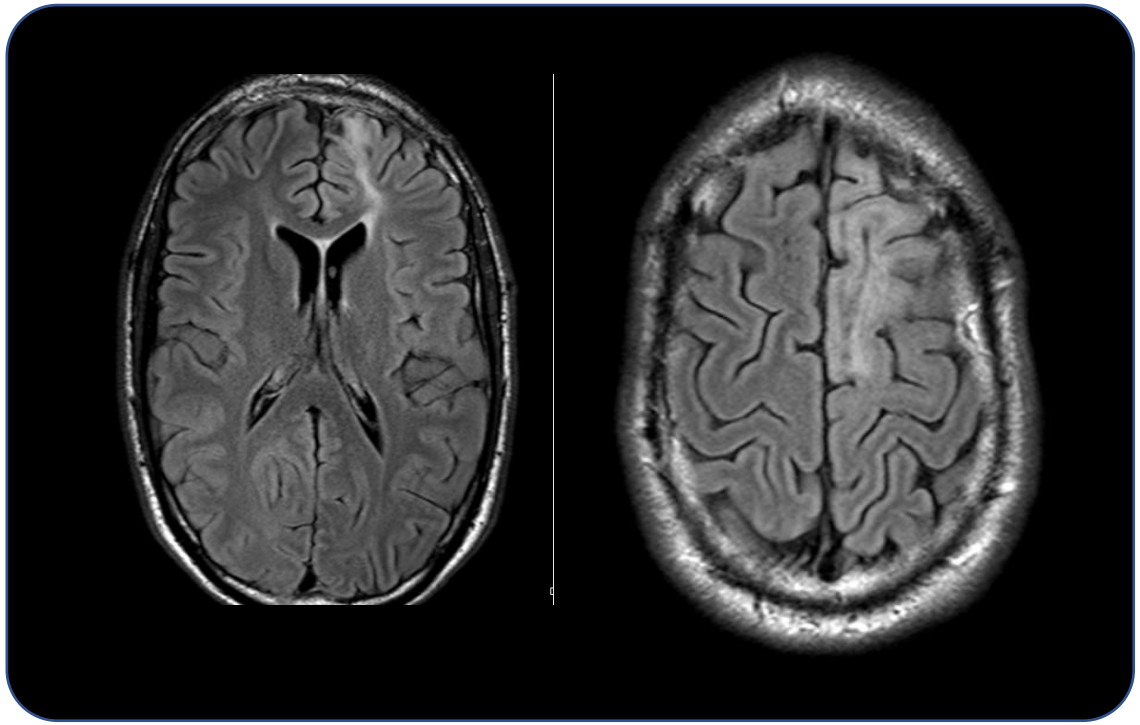
EEG seizure



EEG seizure



Silent (?) discharges



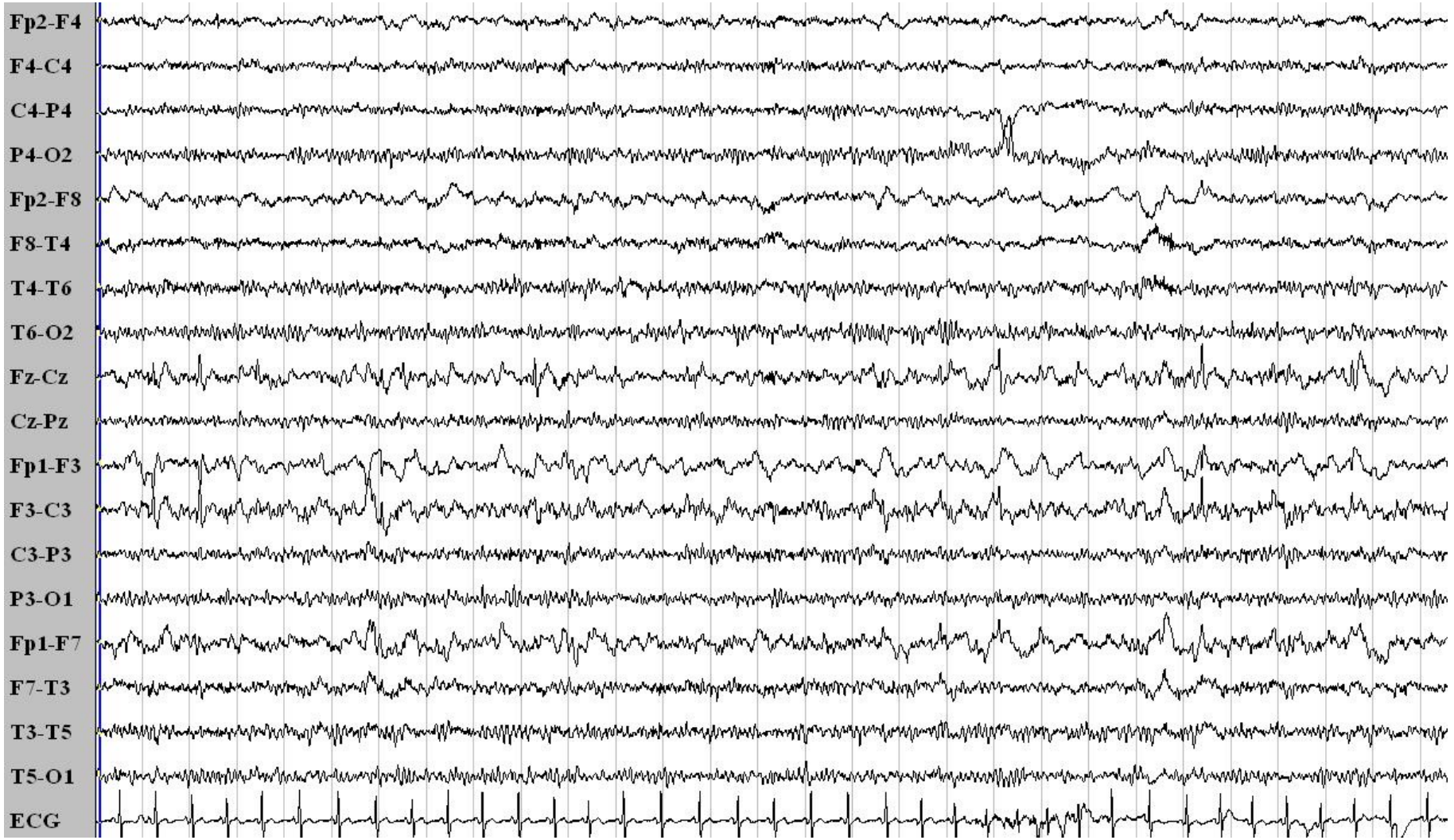
Maschio
30 aa

Aura: sensazione di malessere mal descrivibile a localizzazione vagamente epigastrica (può durare anche un ora)

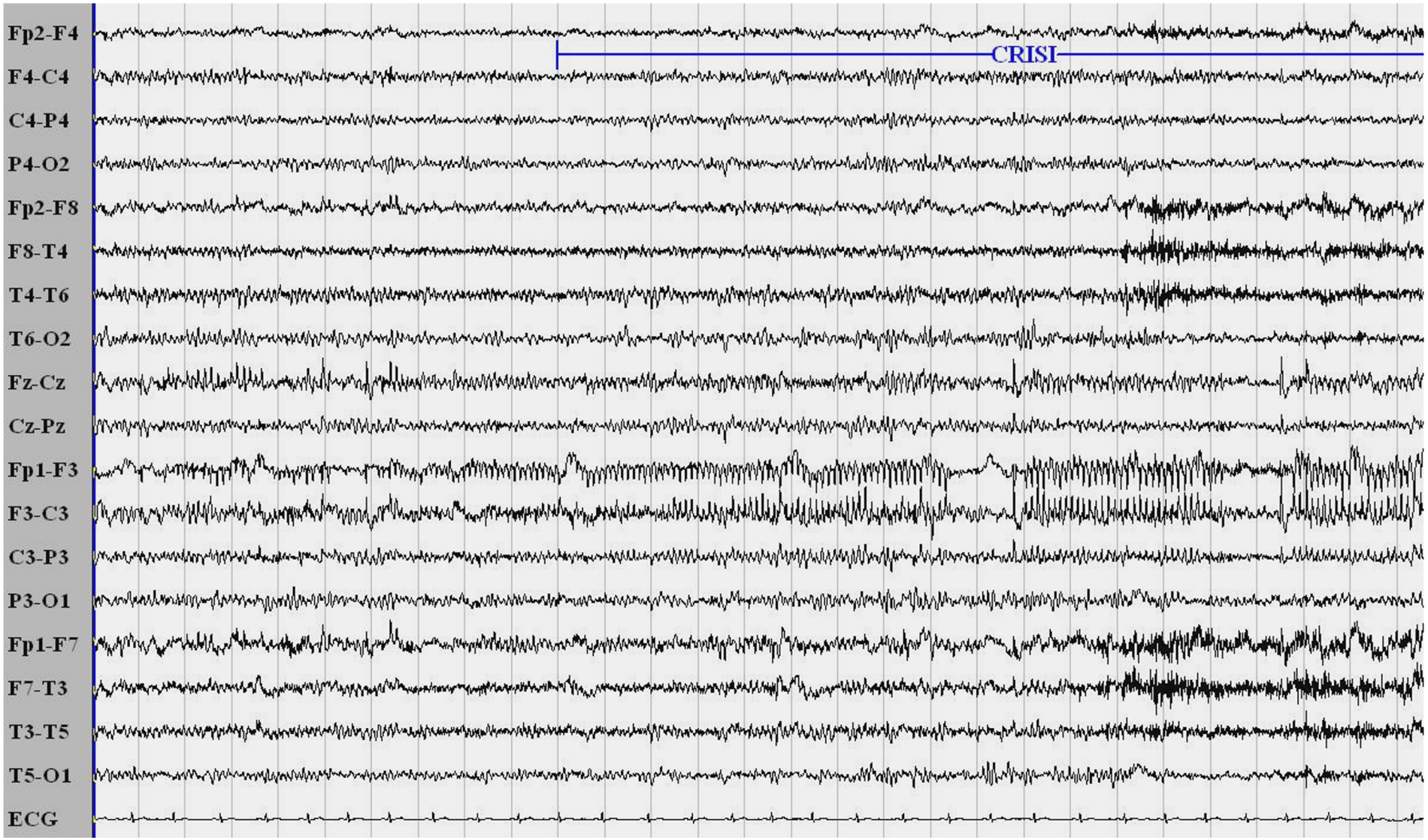
difficoltà nell'eloquio

Irrigidimento agli arti di destra

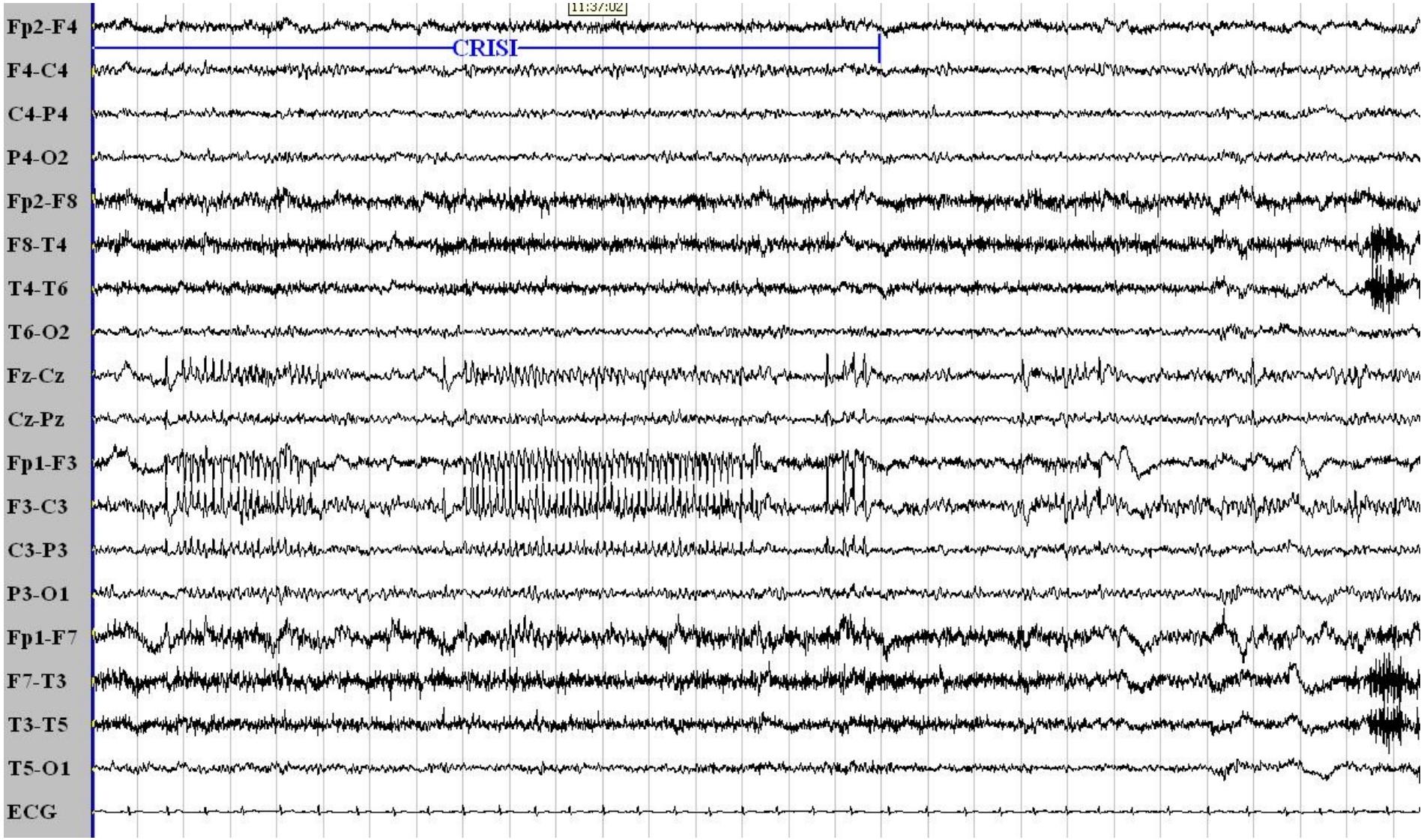
EEG


Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
Fz-Cz
Cz-Pz
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
ECG

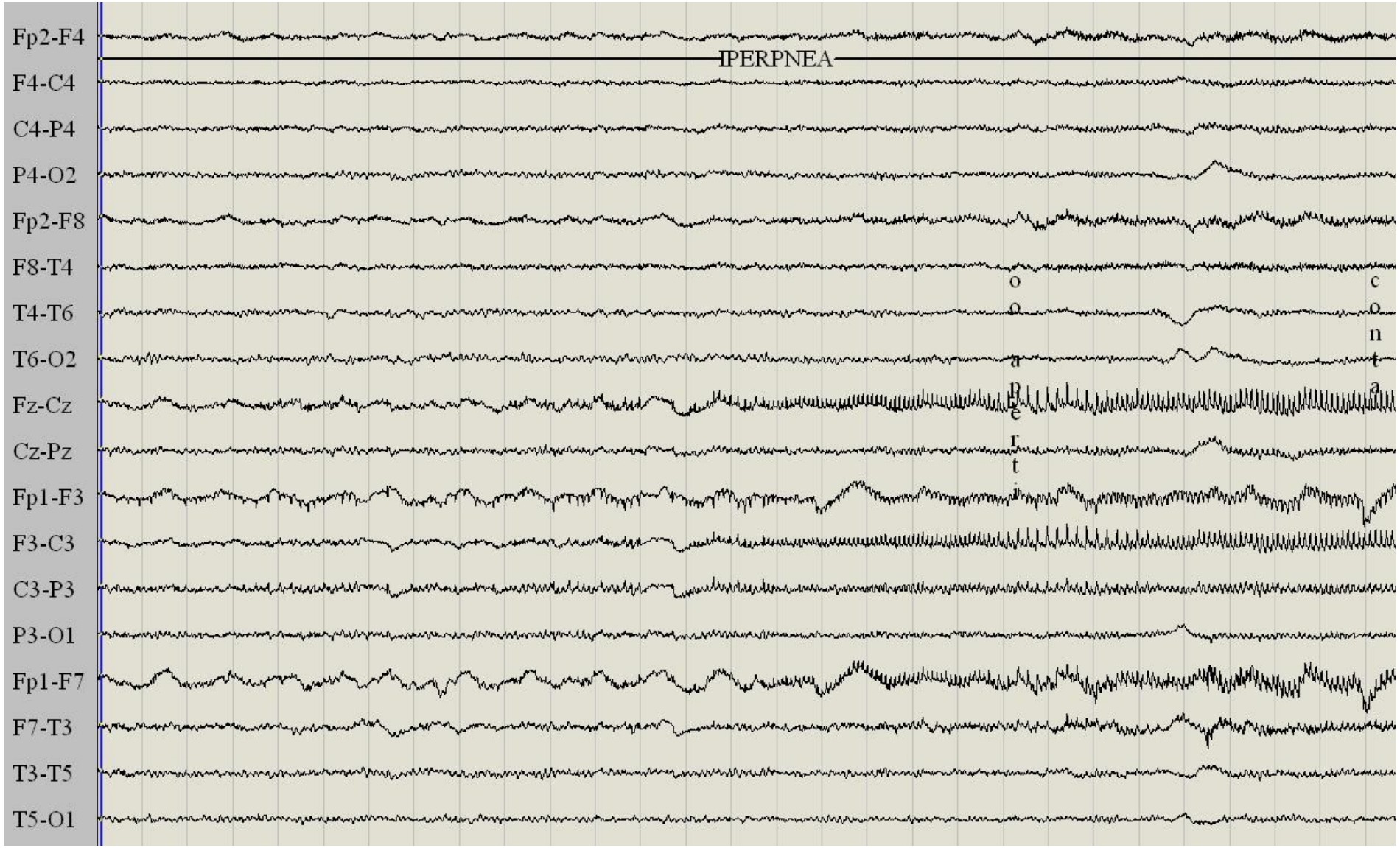
EEG


Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
Fz-Cz
Cz-Pz
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
ECG
CRISI

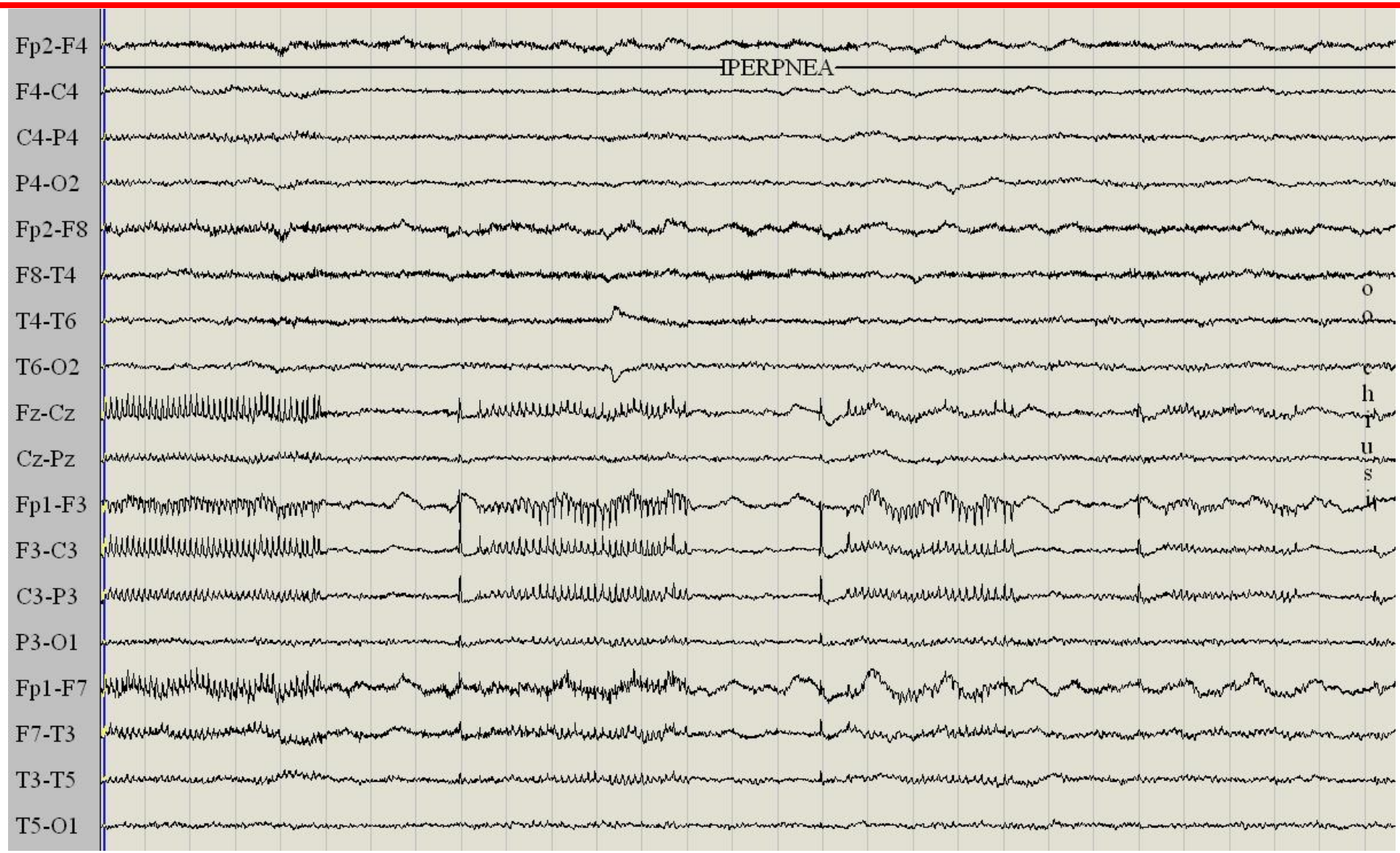
EEG


Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
Fz-Cz
Cz-Pz
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1
ECG
CRISI

EEG


Fp2-F4
IPERPNEA
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
Fz-Cz
Cz-Pz
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1

EEG


Fp2-F4
IPERPNEA
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
Fz-Cz
Cz-Pz
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
F7-T3
T3-T5
T5-O1

Interictal regional paroxysmal fast activity on scalp EEG is common in patients with underlying gliosis

Gopal Krishna Dash [a,1], Chaturbhuj Rathore [a,*,2], Malcolm K. Jeyaraj [a,3], Pandurang Wattamwar [a,4], Sankara P. Sarma [b], Kurupath Radhakrishnan [a,5]

Clinical Neurophysiology 129 (2018) 946–951

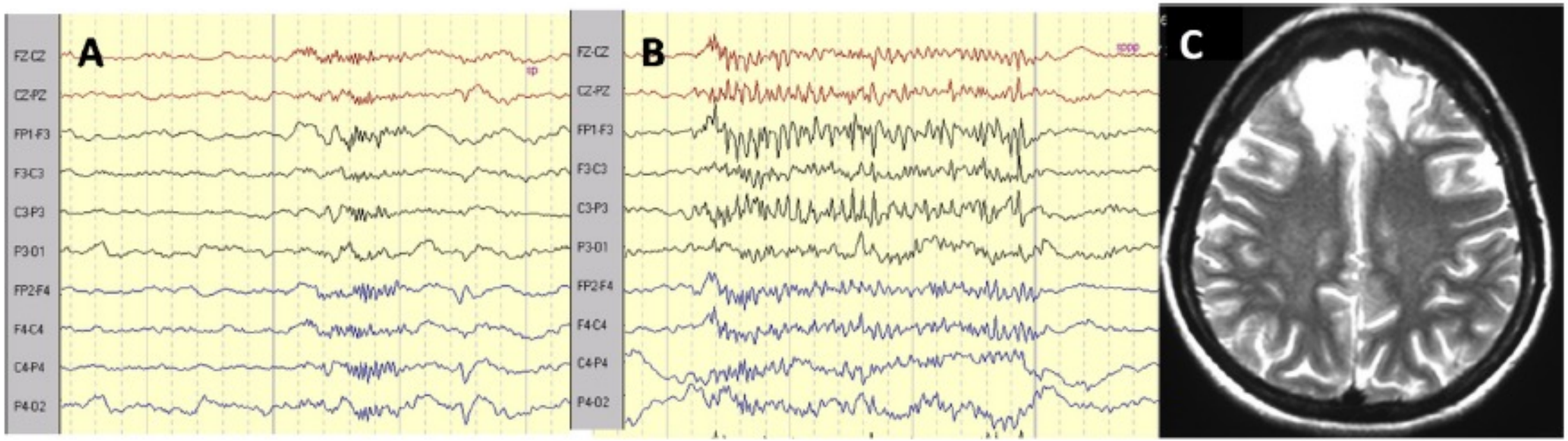
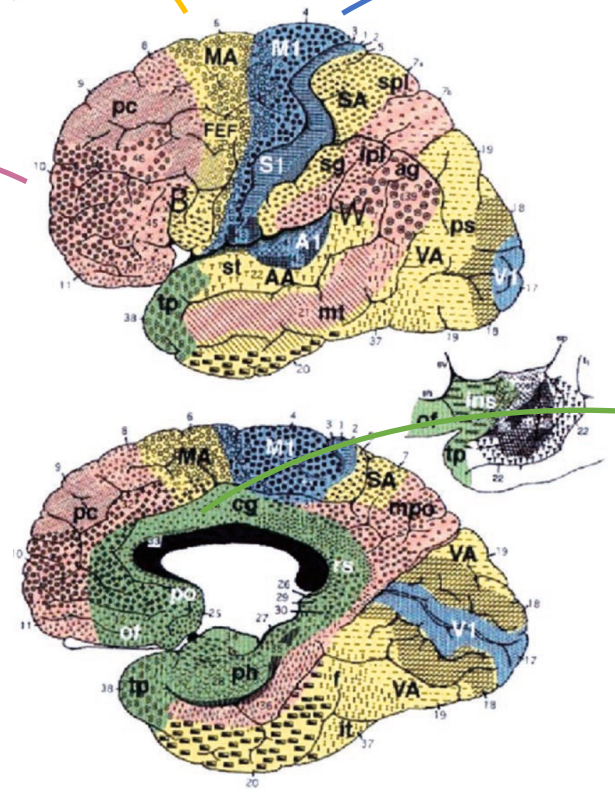


Fig. 3. Interictal EEG in longitudinal bipolar montage showing regional paroxysmal fast activity predominantly over the left frontal region (A, B) in a patient with post-traumatic bifrontal gliosis as noted on axial T2W MRI sequence (C).

M & EEG - *localizzazione*

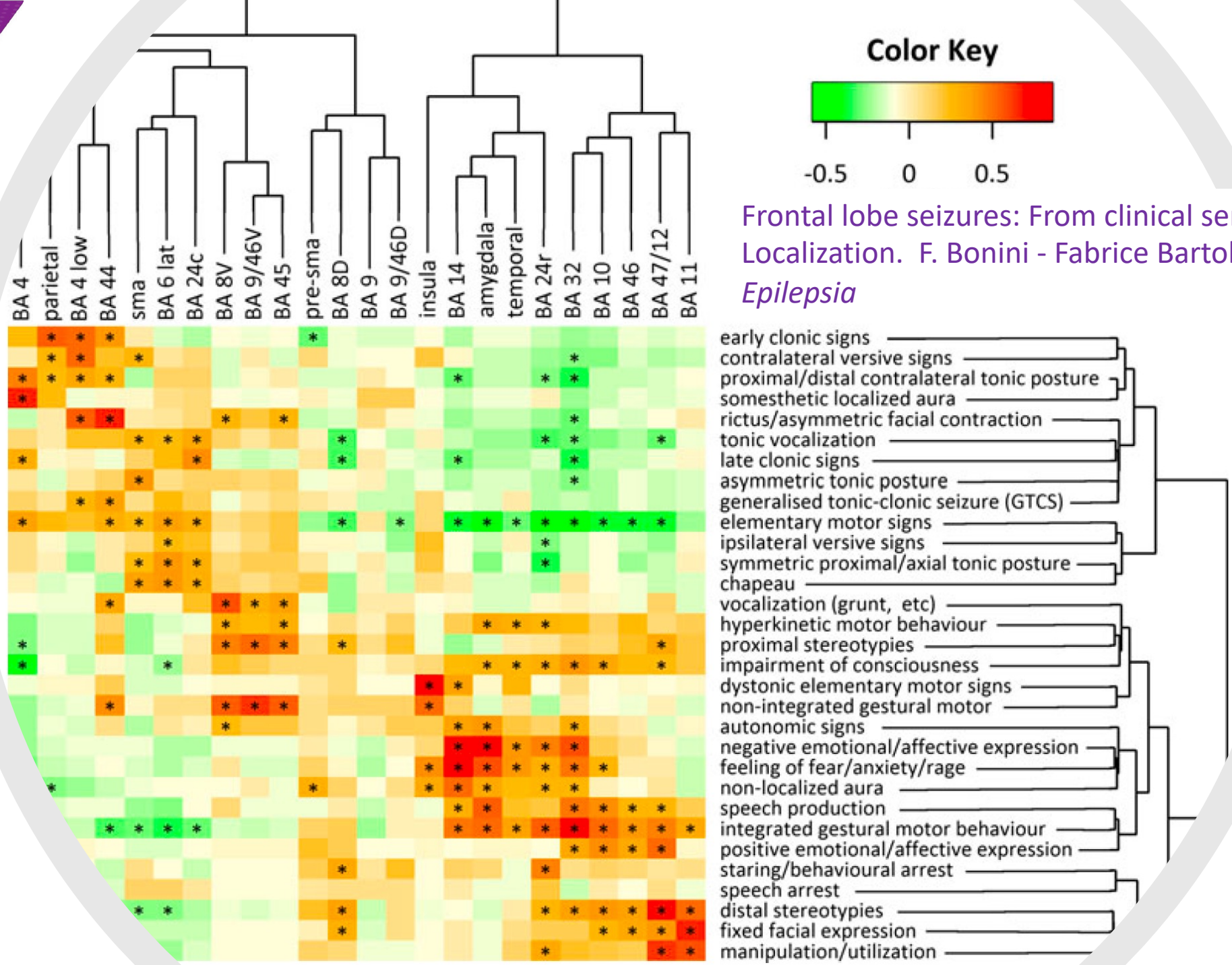
Tonic posturing
Versive
Negative motor

Discognitive



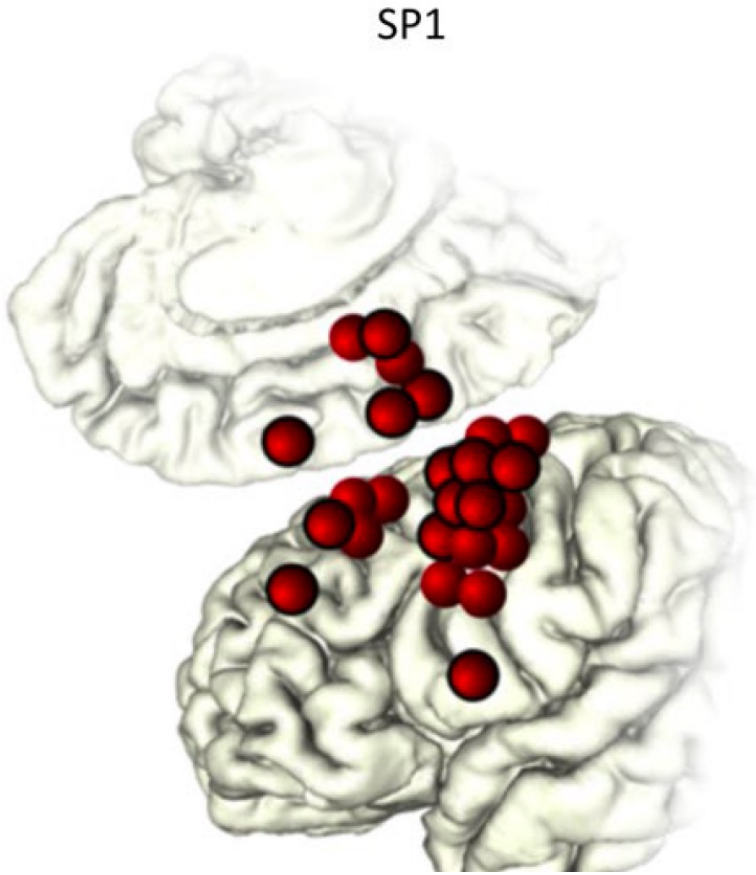
Focal motor
Positive myoclonus
Negative myoclonus

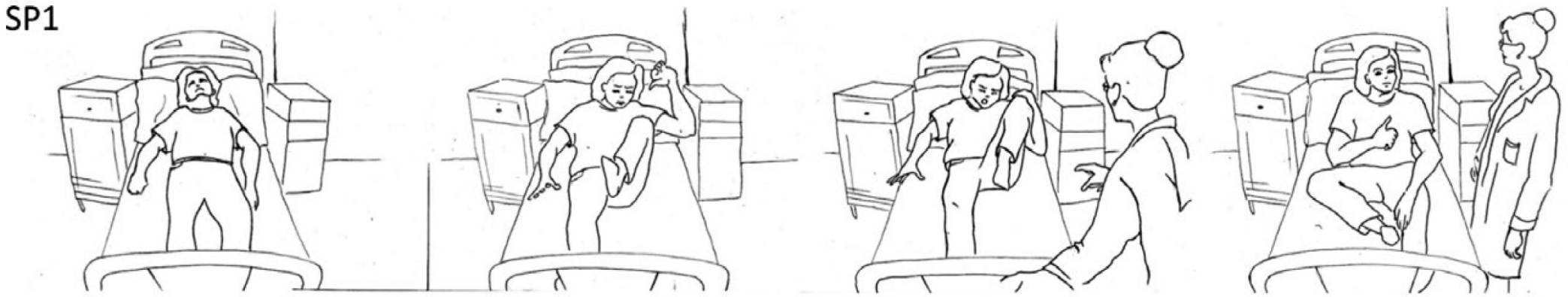
Emotion
Automatism
Hyperkinteic



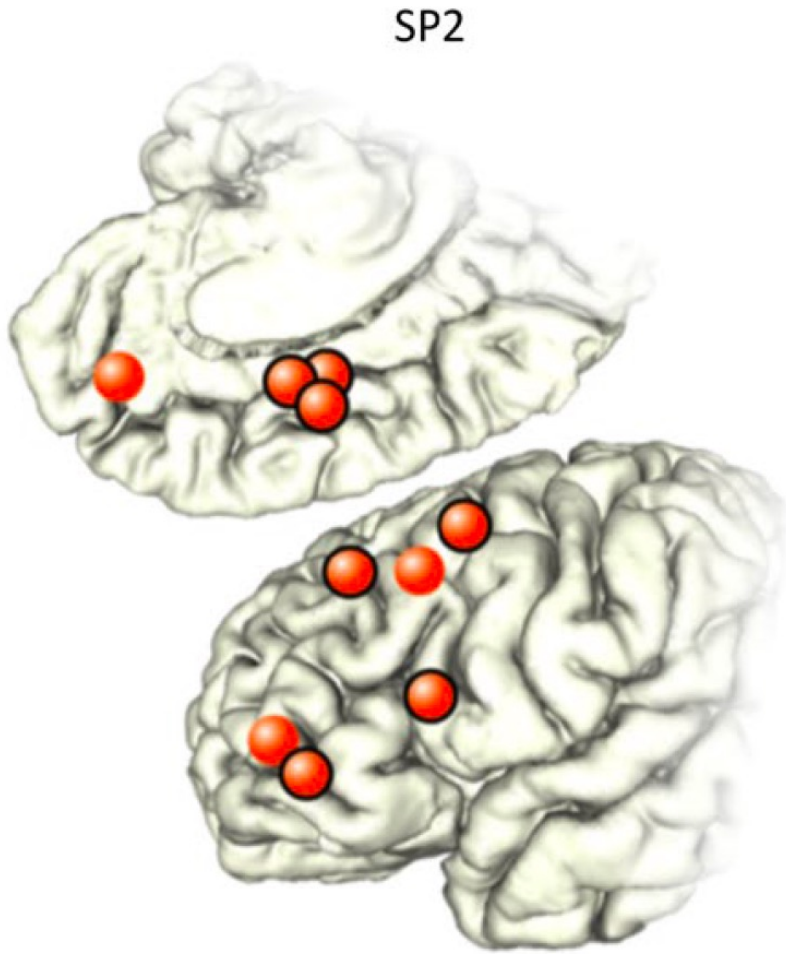
Frontal lobe seizures: From clinical semiology to Localization. F. Bonini - Fabrice Bartolomeri group. *Epilepsia*

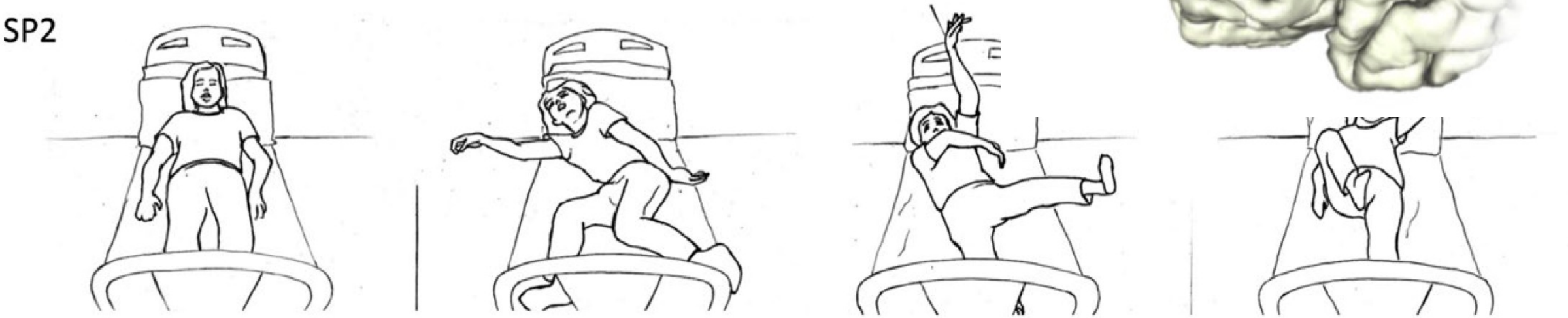
Clinical features of sleep-related hypermotor epilepsy in relation to the seizure-onset zone: A review of 135 surgically treated cases. Gibbs et al., 2019 Epilepsia



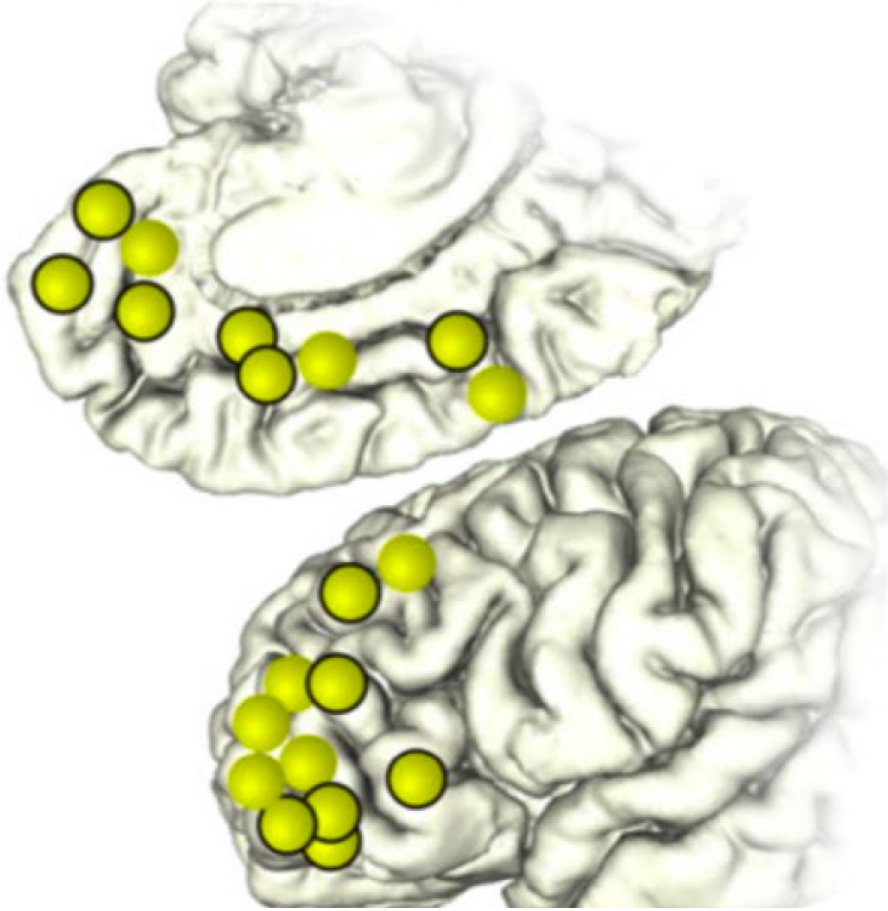


Clinical features of sleep-related hypermotor epilepsy in relation to the seizure-onset zone: A review of 135 surgically treated cases. Gibbs et al., 2019 Epilepsia

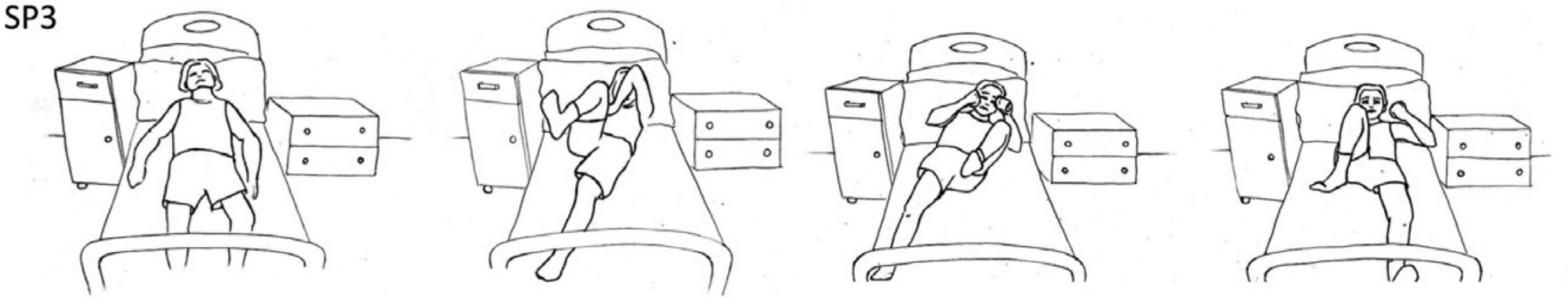




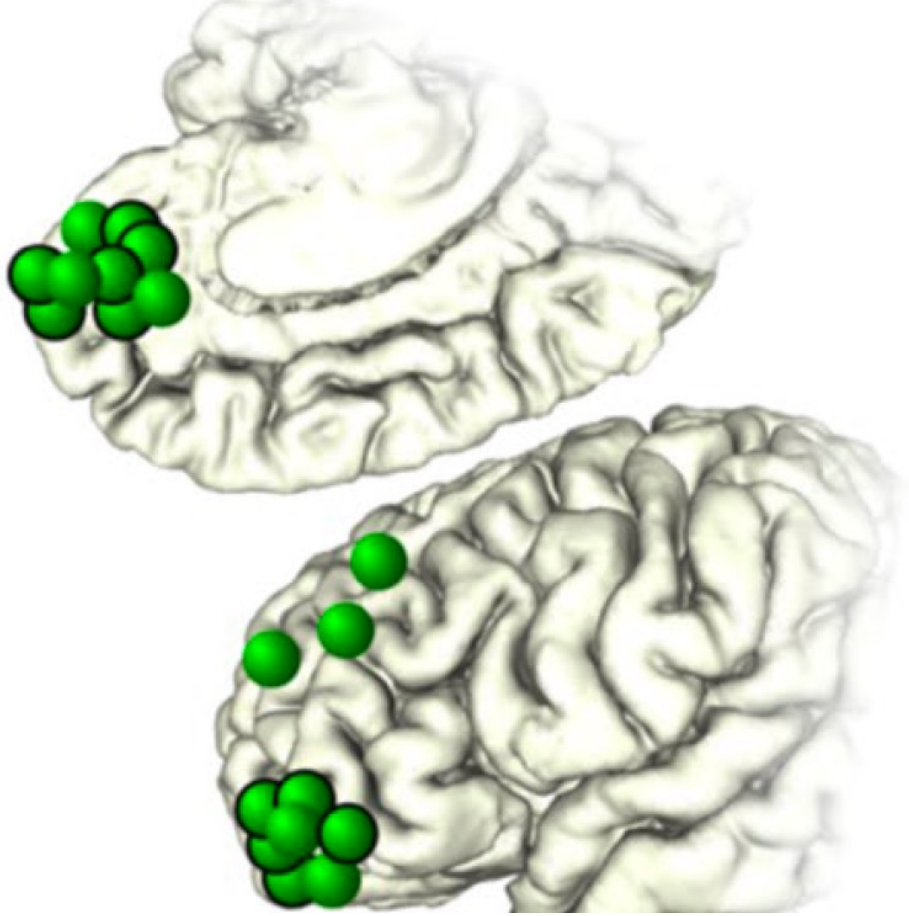
SP3



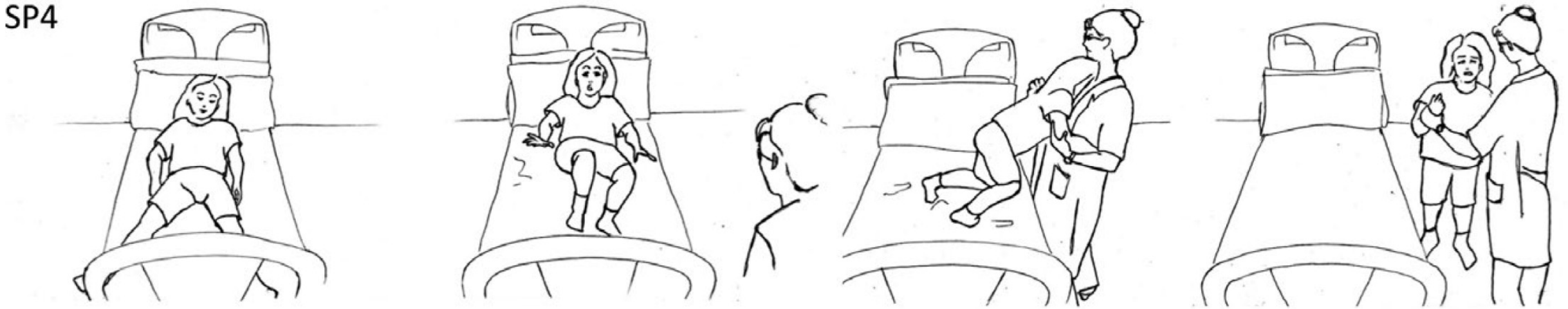
Clinical features of sleep-related hypermotor epilepsy in relation to the seizure-onset zone: A review of 135 surgically treated cases. Gibbs et al., 2019 Epilepsia



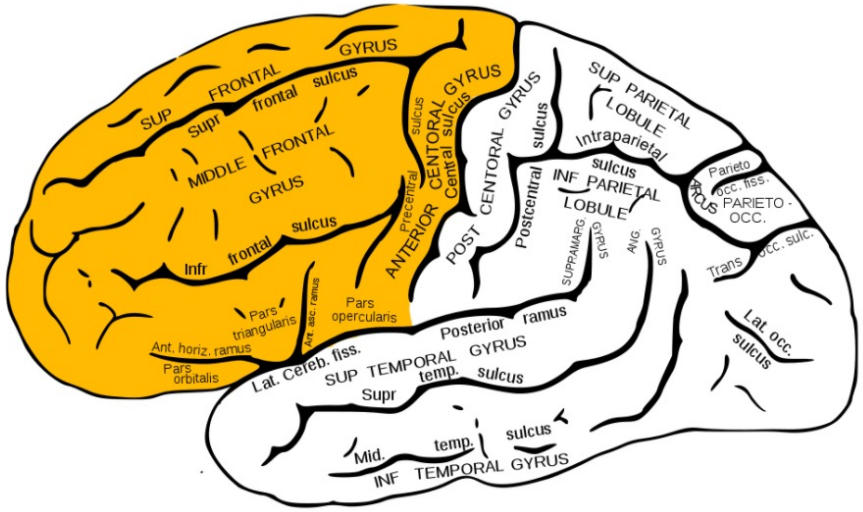
SP4



Clinical features of sleep-related hypermotor epilepsy in relation to the seizure-onset zone: A review of 135 surgically treated cases. Gibbs et al., 2019 Epilepsia



FRONTAL LOBE SEIZURE



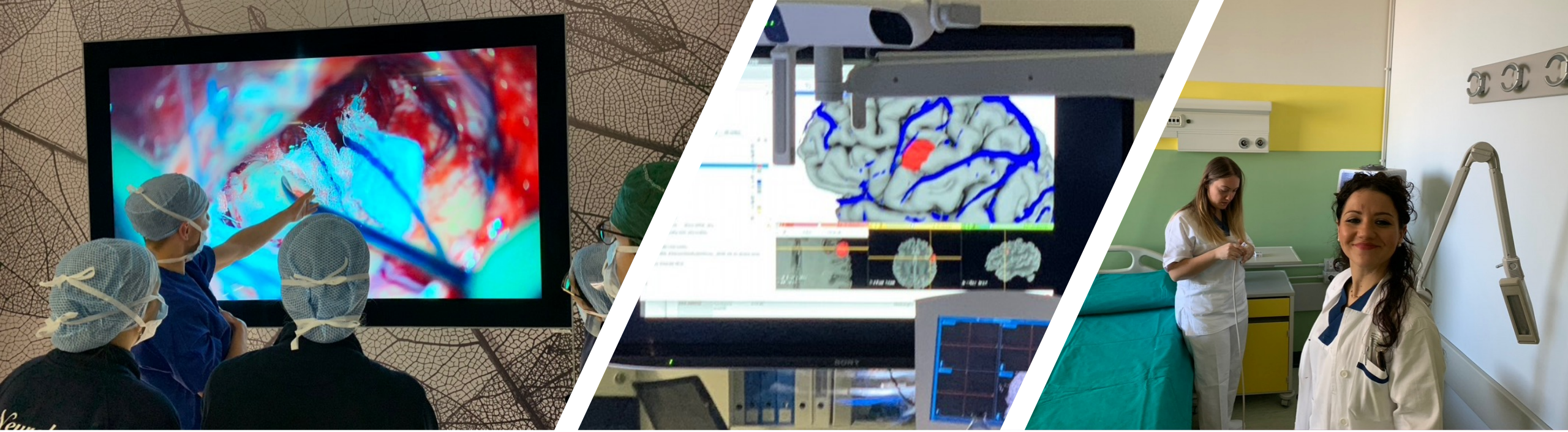
Overview

The frontal lobe is the largest lobe and gives rise to seizures with distinctive features depending on the area of the frontal lobe involved. Motor features are prominent and motor seizure types seen range from focal hyperkinetic seizures with pelvic thrusting and bipedal kicking or pedalling to focal bilateral motor seizures with asymmetric tonic posturing. Frontal lobe seizures may begin with a brief aura, even when seizures occur from sleep. Seizures are typically brief, and can have prominent vocalization, bizarre behavior, urinary incontinence, and head and eye deviation. Frontal lobe seizures may be exclusively nocturnal and often cluster. The ictal EEG may not show ictal patterns or may be obscured by movement artifact.

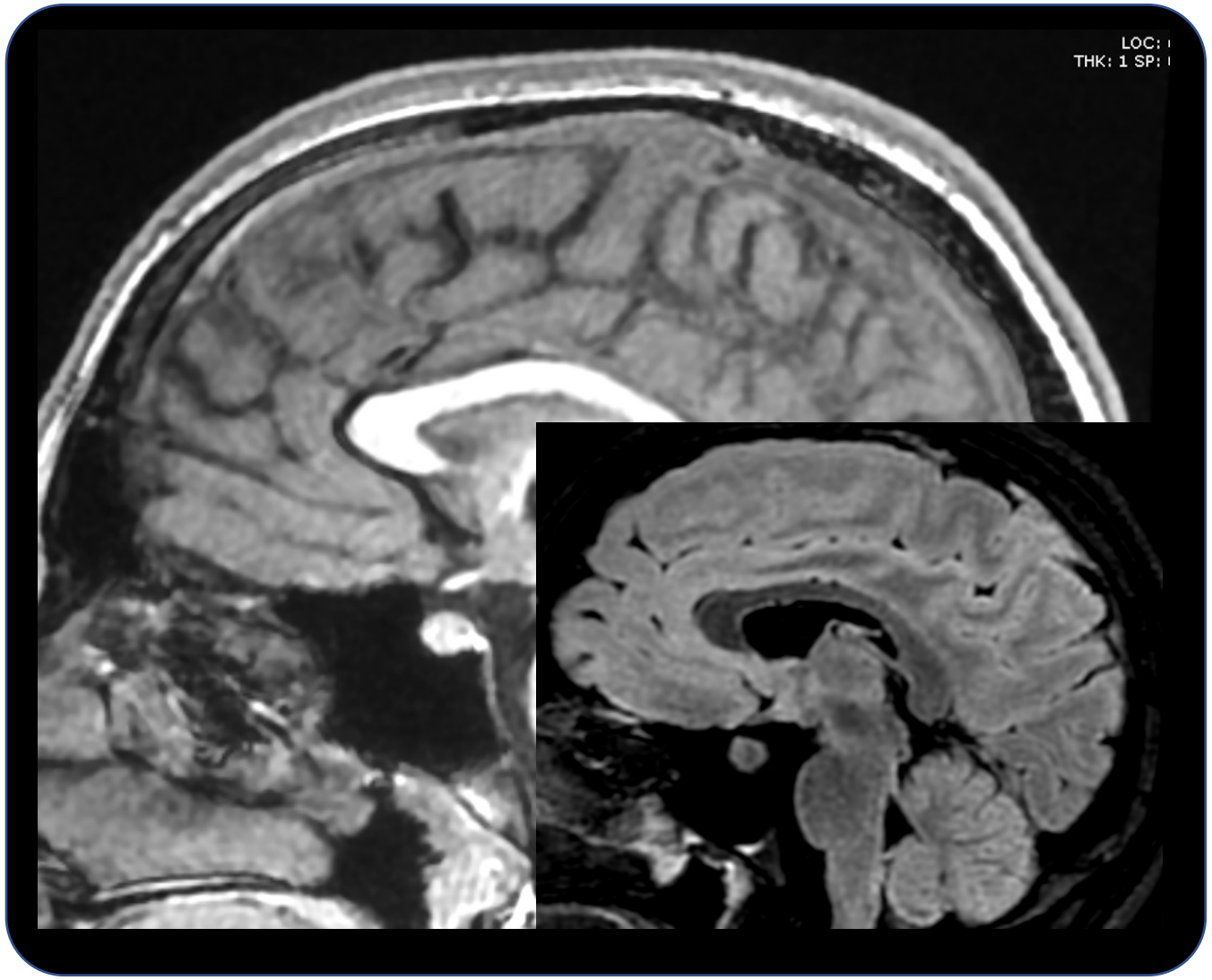
CAUTION When awareness is impaired, frontal focal impaired awareness seizures can be difficult to distinguish from absence seizures.

Grazie per l'attezione

Epilepsy monitoring Unit
& surgery team
AOU Modena



Corteccia del cingolo: SHE

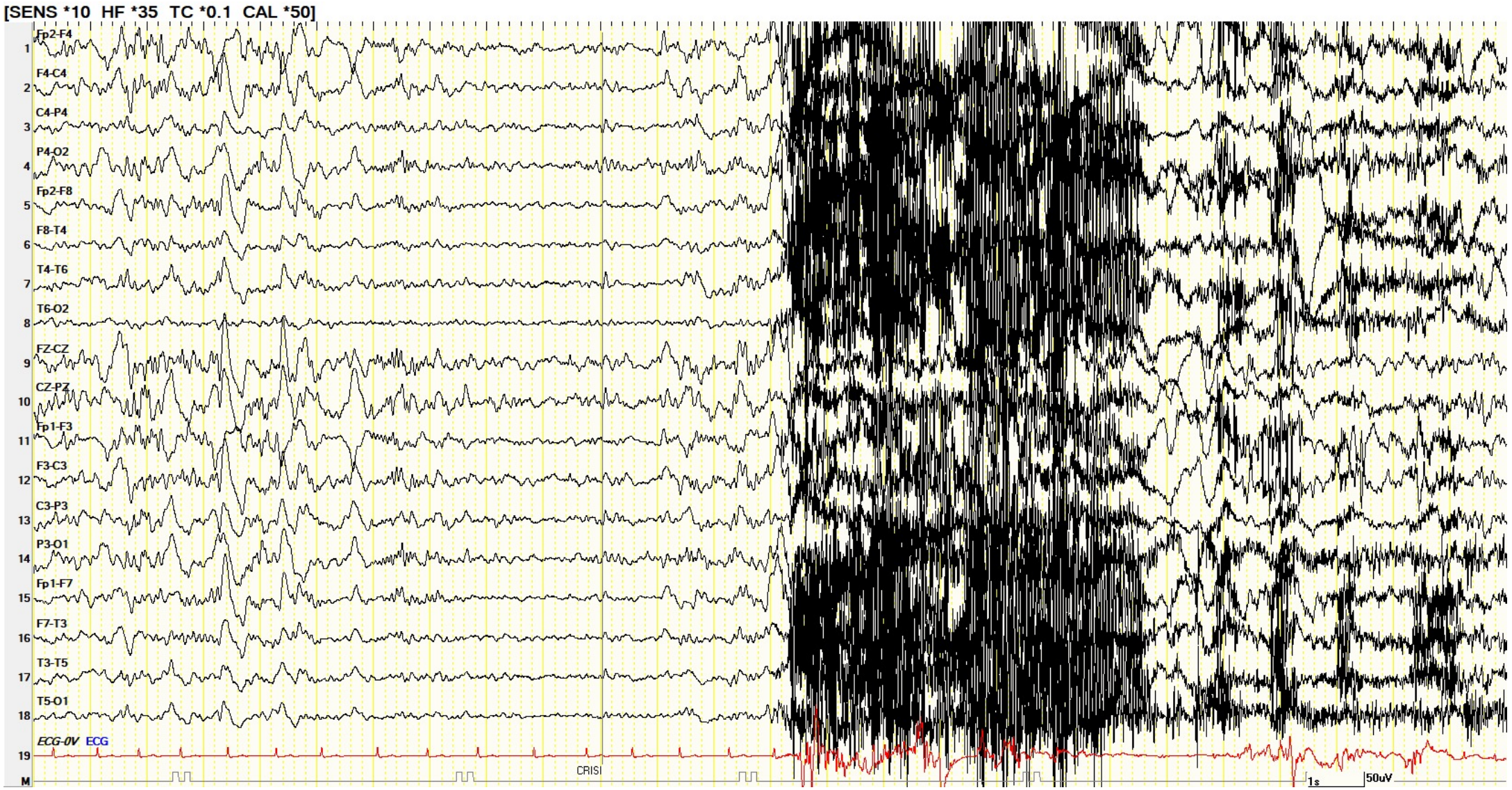


- ✓ Esordio nell' infanzia (all'età di 3 anni) di episodi notturni caratterizzati da scatto improvviso. La paziente tende a "rigirarsi" nel letto e ad estendere e muovere ritmicamente gli arti. Rapida ripresa del contatto.
- ✓ Rare crisi convulsive.
- ✓ Crisi sempre legate al sonno. Eccezionalmente in veglia.
- ✓ Frequenza: plurisettimanale. Mai libera da crisi

Corteccia del cingolo: SHE

0.50’’

EEG


[SENS *10 HF *35 TC *0.1 CAL *50]
1 Fp2-F4
2 F4-C4
3 C4-P4
4 P4-O2
5 Fp2-F8
6 F8-T4
7 T4-T6
8 T6-O2
9 FZ-CZ
10 CZ-PZ
11 Fp1-F3
12 F3-C3
13 C3-P3
14 P3-O1
15 Fp1-F7
16 F7-T3
17 T3-T5
18 T5-O1
19 ECG-0V ECG
M
CRISI
1s
50uV

EEG


[SENS *10 HF *35 TC *0.1 CAL *50]
Fp2-F4
F4-C4
C4-P4
P4-O2
Fp2-F8
F8-T4
T4-T6
T6-O2
FZ-CZ
CZ-PZ
Fp1-F3
F3-C3
C3-P3
P3-O1
Fp1-F7
FZ-T3
T3-T5
T5-O1
ECG-0V ECG
1s
50uV

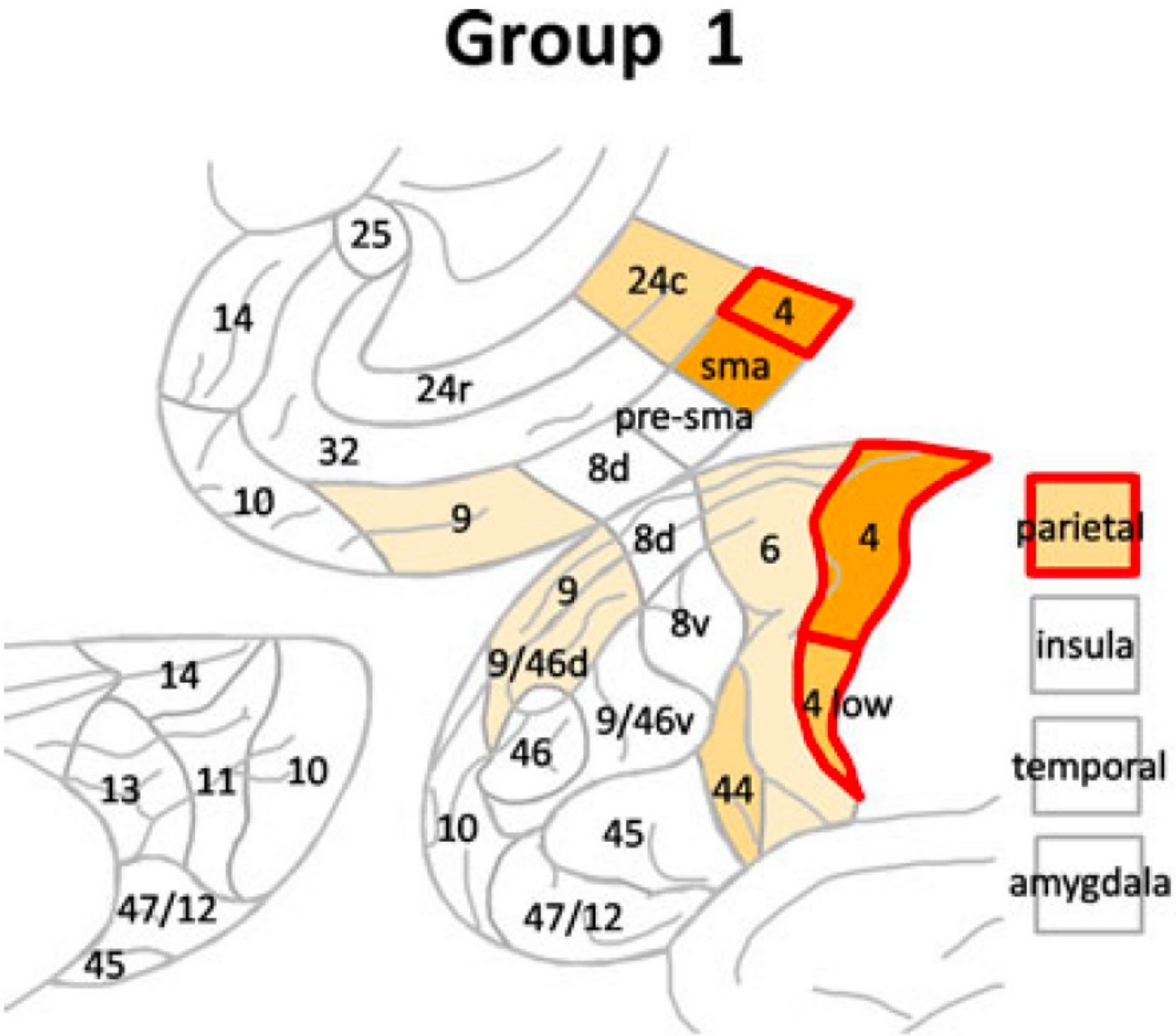
EEG


[SENS *10 HF *35 TC *0.1 CAL *50]
1 Fp2-F4
2 F4-C4
3 C4-P4
4 P4-O2
5 Fp2-F8
6 F8-T4
7 T4-T6
8 T6-O2
9 FZ-CZ
10 CZ-PZ
11 Fp1-F3
12 F3-C3
13 C3-P3
14 P3-O1
15 Fp1-F7
16 F7-T3
17 T3-T5
18 T5-O1
19 ECG-0V ECG
M
1s
50uV

EEG


[SENS *10 HF *35 TC *0.1 CAL *50]
1 Fp2-F4
2 F4-C4
3 C4-P4
4 P4-O2
5 Fp2-F8
6 F8-T4
7 T4-T6
8 T6-O2
9 FZ-CZ
10 CZ-PZ
11 Fp1-F3
12 F3-C3
13 C3-P3
14 P3-O1
15 Fp1-F7
16 F7-T3
17 T3-T5
18 T5-O1
19 ECG-0V ECG
M
1s
50uV

Group 1	
v-Test	Sign
4.59	Early clonic signs*
3.76	Elementary motor signs*
3.61	Proximal/distal contralateral tonic posture*
3.56	Somesthetic localized aura*
3.45	Contralateral versive signs*
3.33	Asymmetric tonic posture*
3.16	Tonic vocalization*
2.04	Generalized tonic–clonic seizure (GTCS)
2.01	Rictus/asymmetric facial contraction
−2.08	Speech production
−2.09	Negative emotional/affective expression
−2.09	Chapeau
−2.10	Nonintegrated gestural motor
−2.11	Autonomic signs
−2.19	Hyperkinetic motor behavior
−2.21	Distal stereotypies
−2.36	Proximal stereotypies*
−2.59	Feeling of fear/anxiety/rage*
−3.12	Integrated gestural motor behavior*
−3.78	Impairment of consciousness*
−3.83	Nonlocalized aura*



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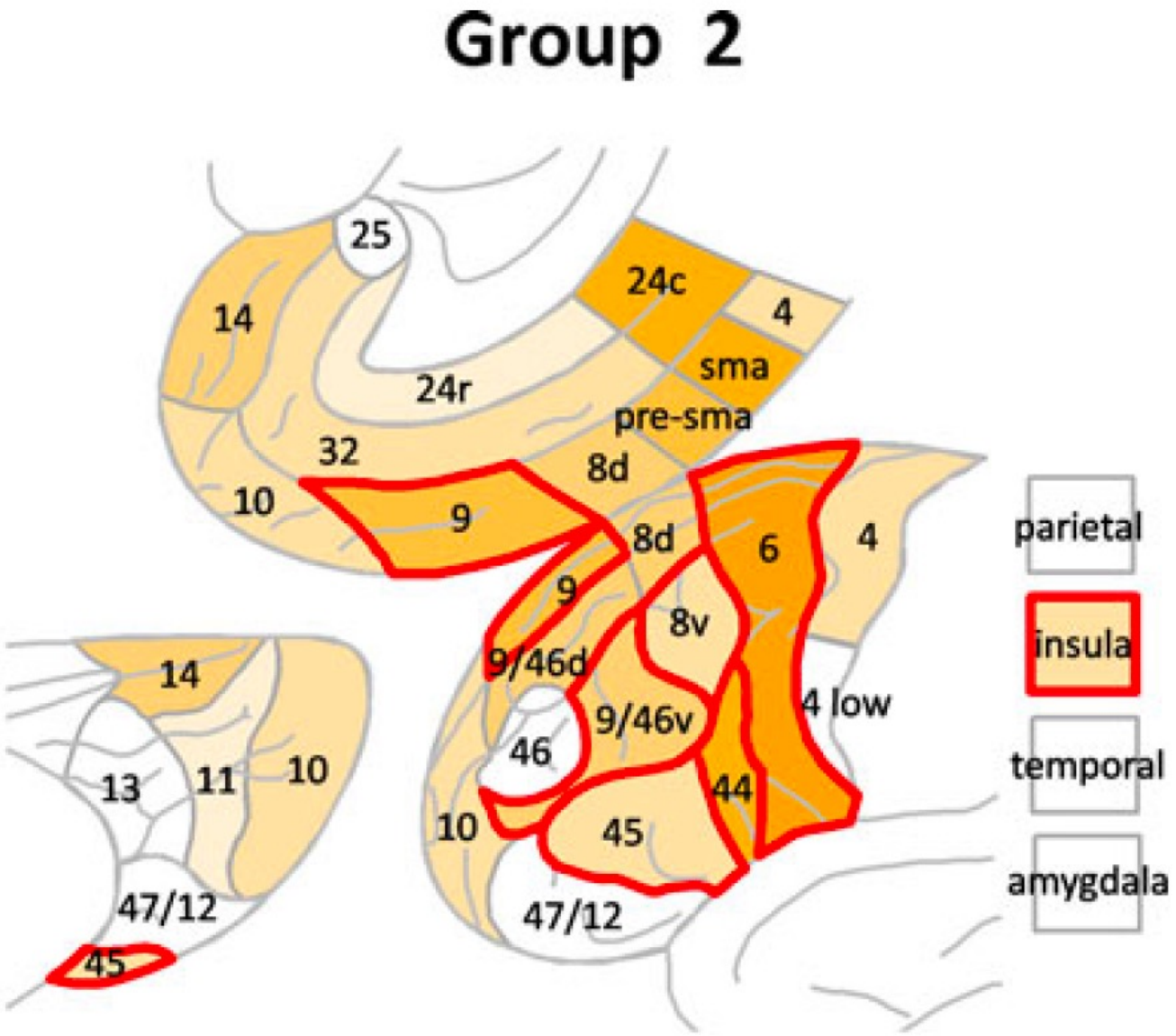
Group 2	
v-Test	Sign
4.38	Symmetric proximal/axial tonic posture*
3.76	Nonintegrated gestural motor *
3.75	Chapeau*
2.43	Nonlocalized aura*
2.24	Elementary motor signs
2.12	Vocalization (grunt, etc.)
−2.00	Manipulation/utilization
−2.17	Speech production
−2.19	Fixed facial expression
−2.57	Early clonic signs*
−2.94	Distal stereotypies*
−3.34	Integrated gestural motor behavior*



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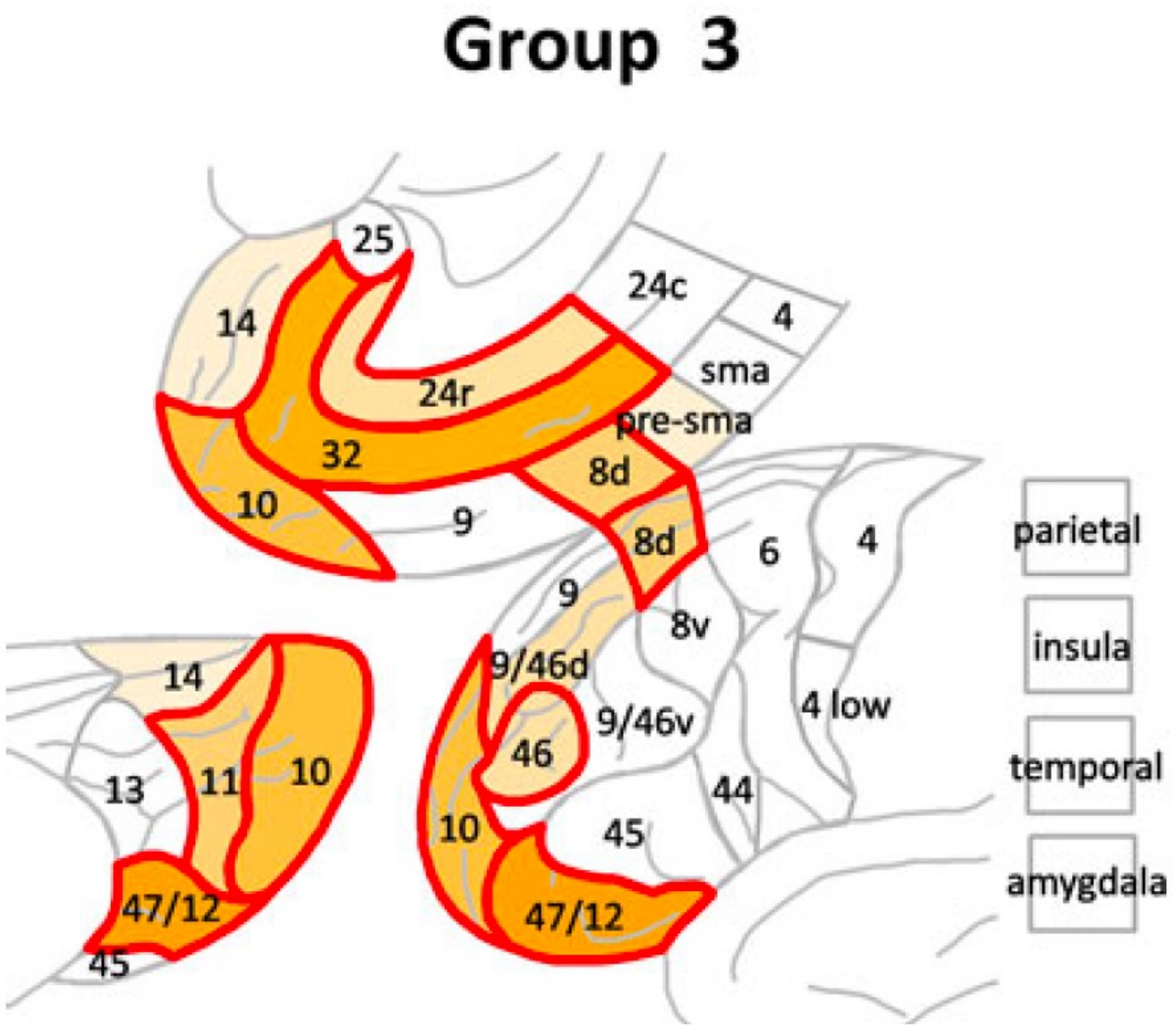
Group 3	
v-Test	Sign
7.16	Distal stereotypies*
5.33	Fixed facial expression*
4.97	Integrated gestural motor behavior*
4.86	Manipulation/utilization*
3.00	Positive emotional/affective expression*
2.90	Proximal stereotypies*
2.66	Impairment of consciousness*
2.07	Speech production
−2.07	Ipsilateral versive signs
−2.09	Proximal/distal contralateral tonic posture
−2.15	Late clonic signs
−2.40	Symmetric proximal/axial tonic posture*
−2.51	Tonic vocalization*
−4.73	Elementary motor signs*



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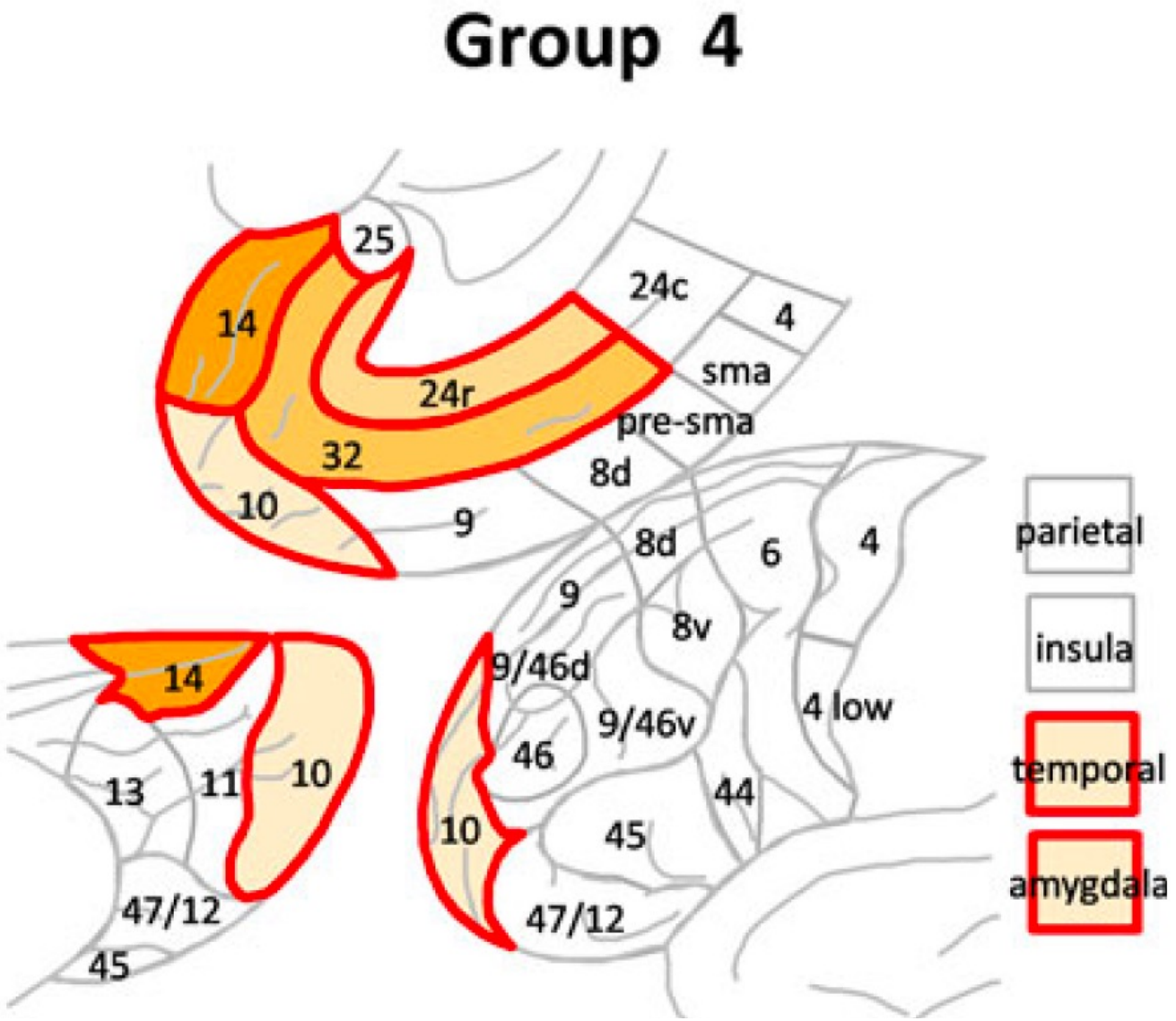
Group 4	
v-Test	Sign
5.77	Negative emotional/affective expression*
4.58	Feeling of fear/anxiety/rage*
4.21	Speech production*
3.94	Integrated gestural motor behavior*
3.04	Autonomic signs*
2.49	Nonlocalized aura*
2.47	Hyperkinetic motor behavior*
2.09	Impairment of consciousness
−3.39	Elementary motor signs*



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