Dichiariamo l’assenza di conflitto di interesse, e la assoluta autonomia dei contenuti

Teaching course

LA NEUROFISIOLOGIA NEI DISTURBI FUNZIONALI

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Chapter 6

Neurophysiologic studies of functional neurologic disorders

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Functional weakness/paralysis

Functional sensory loss

Functional movement disorders

Tremor

Myoclonus

Dystonia

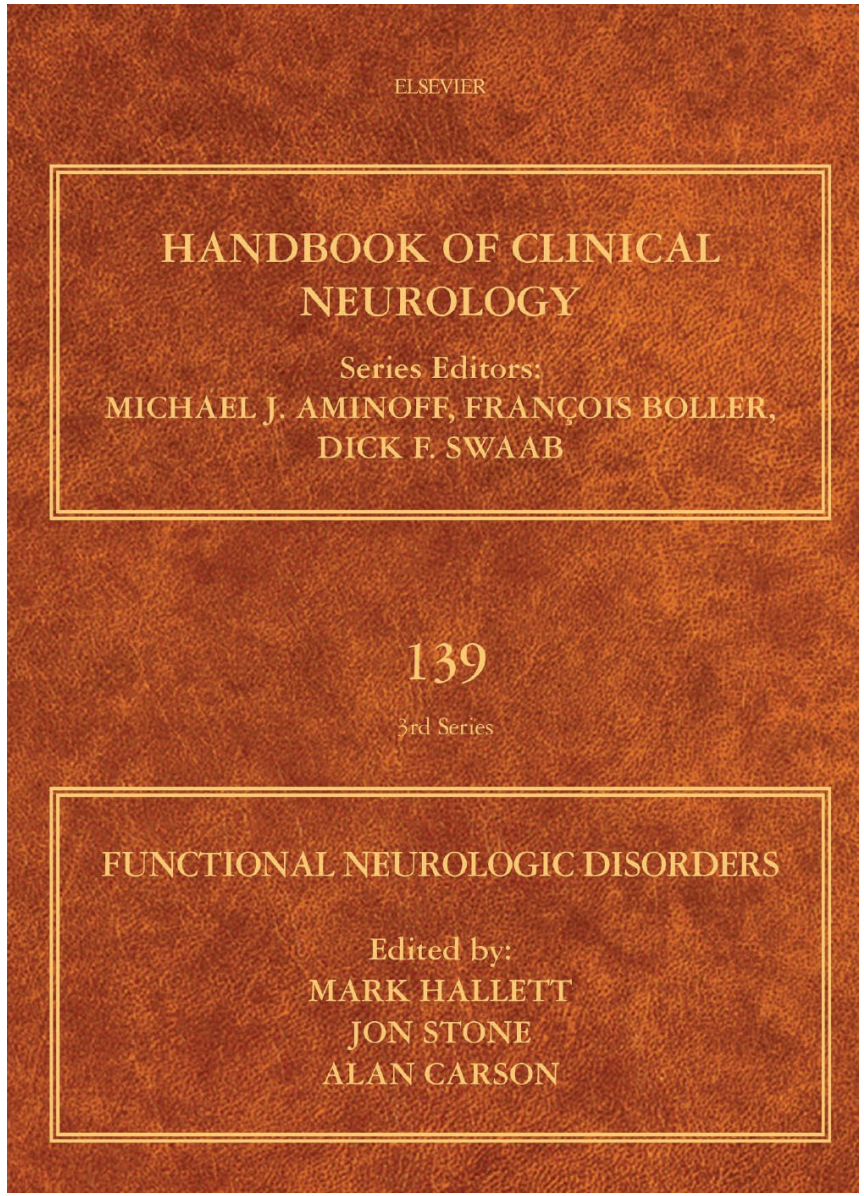
Paroxysmal disorders

Rigidity

Others

Gait disorders

Psychogenic nonepileptic seizures (PNES)



Abrupt onset

Static course

Paroxysmal, periods of spontaneous remission

Inconsintent over time (increase with attention, decrease with distraction)

Incongruent

Selective and exaggerated disability

Mild physical trauma or precipitating event before onset

Previous exposure do a disease model

Response to placebo

Psychiatric comorbidities

Multiple somatizations/undiagnosed conditions

Secondary gain

Diagnostic criteria of Functional movement disorders

Fahn and Williams criteria (1988)
Documented, clinically established, probable, possible

Williams et al (1995)
Clinically definite and NF supported [EEG (BP for myoclonus), poligraphy (entrainment for tremor)]
probable, possible

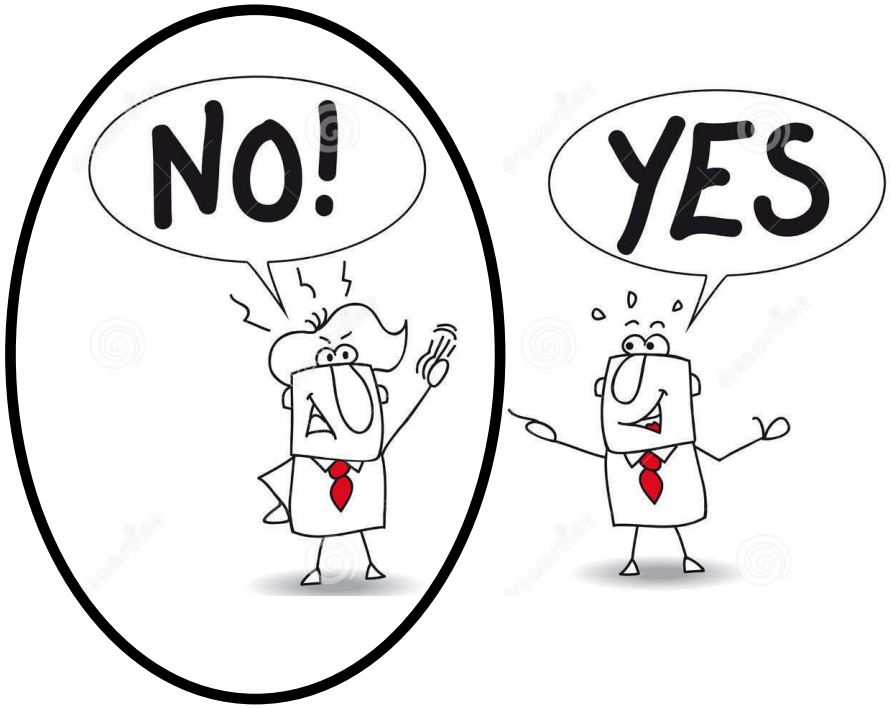
Shill and Gerber criteria (2006)
Clinically proven (+ EEG for BP for myoclonus only)
Clinically definite, probable, possible

Gupta and Lang (2009)
Clinically definite (also in the absence of psychiatric disturbance/false neurological signs)
Laboratory supported definite [EEG (BP for myoclonus), poligraphy (entrainment for tremor)]

Movement Disorders, Vol. 27, No. 4, 2012

Diagnostic Agreement in Patients with Psychogenic Movement Disorders

Francesca Morgante, PhD,[1] Mark J. Edwards, PhD,[2]
Alberto J. Espay, PhD,[3] Alfonso Fasano, PhD,[4]
Pablo Mir, PhD,[5,6] and Davide Martino, PhD,[7,8*]
on behalf of the DISMOV-SIN study group on psychogenic movement disorders[8†]



Dichotomous Judgment	MDS Experts κ (SE, 95% CI)	Non-MDS Experts κ (SE, 95% CI)
Video	0.40 (0.06, 0.34–0.46)	0.34 (0.08, 0.27–0.42)
Video+historical details	0.81 (0.04, 0.78–0.85)	0.74 (0.03, 0.71–0.7)

In conclusion, our data suggest that the diagnostic agreement on PMD is poor, based on review of phenomenology by video alone, and strongly relies upon **clinical interpretation of historical features** and diagnostic workup. The limited usefulness of currently available clinical criteria for PMD in reliably classifying uncertain cases suggests the need for new diagnostic criteria.

Functional tremor

Tremor present at rest, posture and action, same frequency in different limbs

Coactivation of antagonistic muscles before tremor onset

Fingers are generally spared

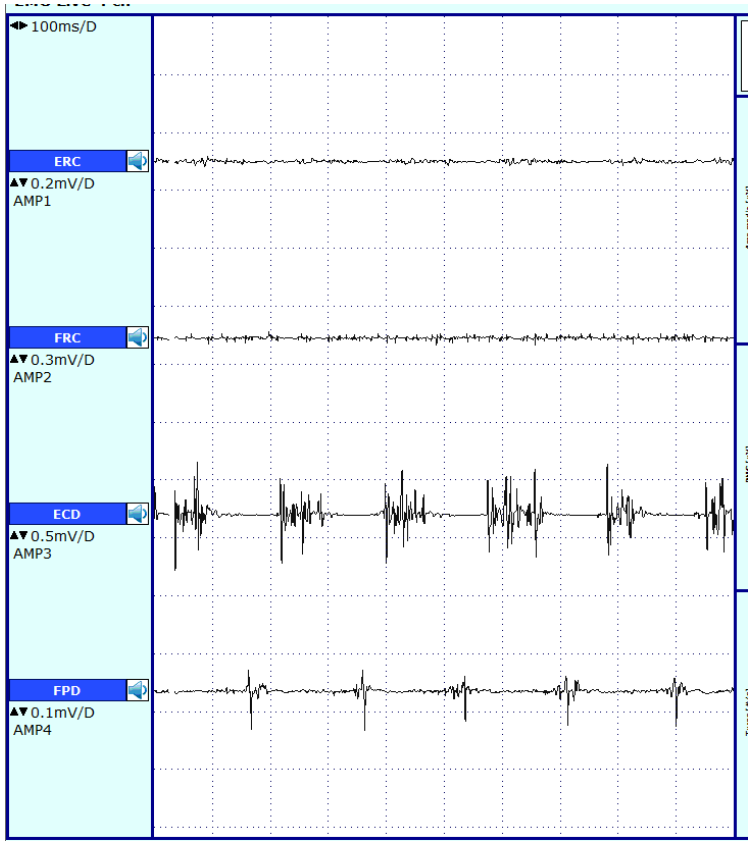
Tremor varying in frequency with distraction and entrainment

Amplitude decrement during contralateral ballistic movement

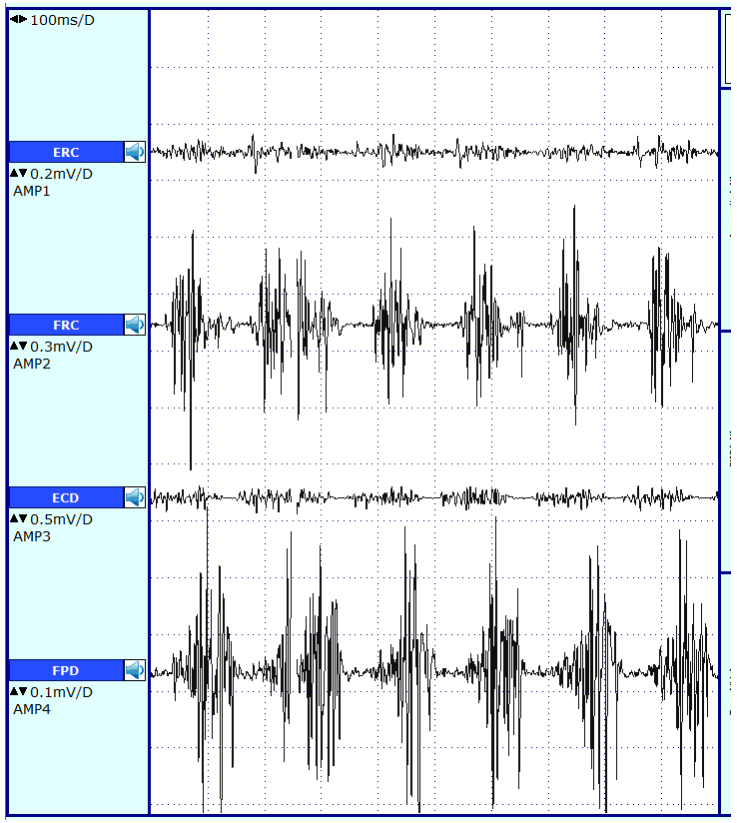
Amplitude and frequency increase during loading (500g-1kg)

Tremore essenziale ‘vero’

Posizione primaria



Carico



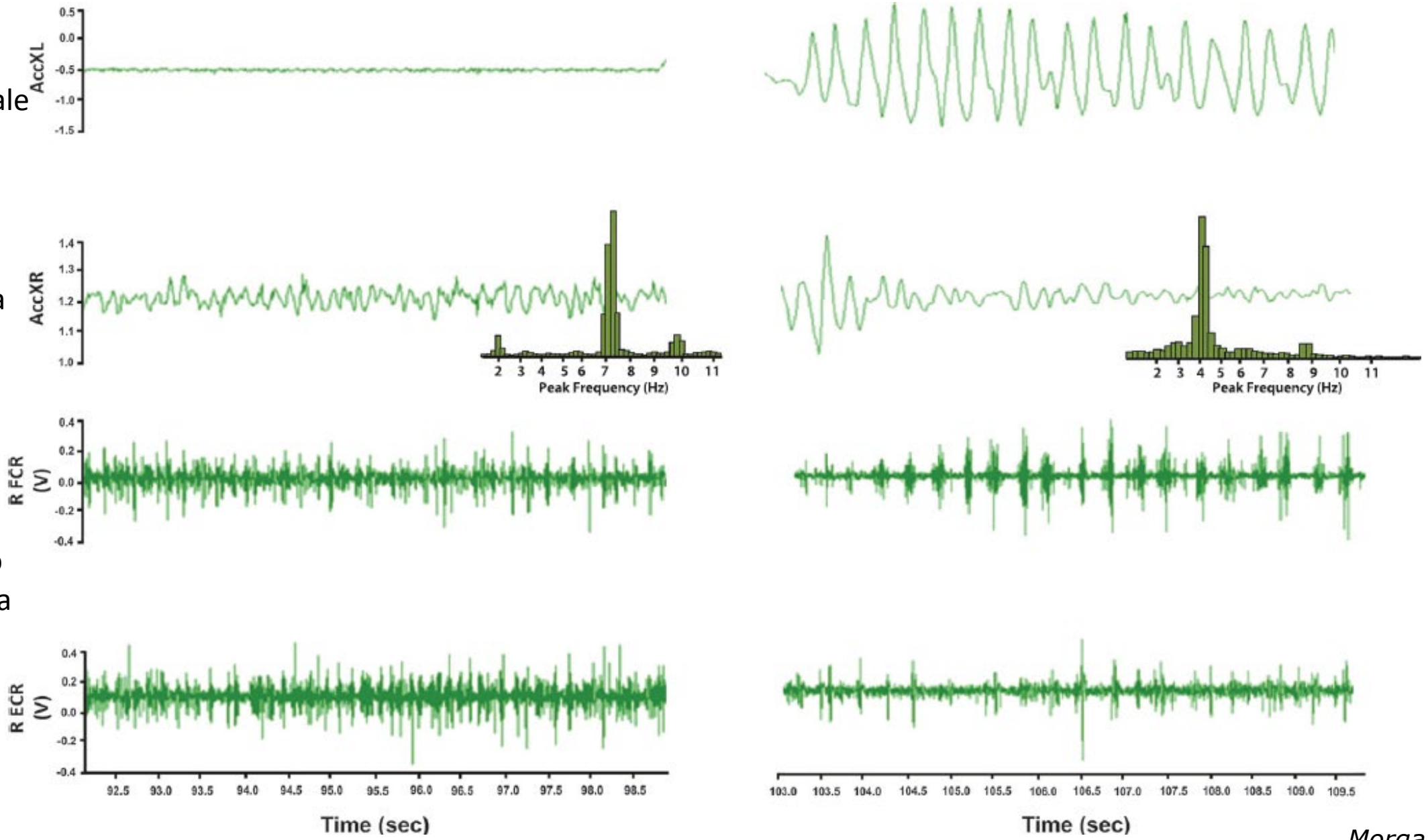
Riposo

Entrainment 4 Hz

Mano normale

Mano affetta

Mano affetta



Morgante et al 2013

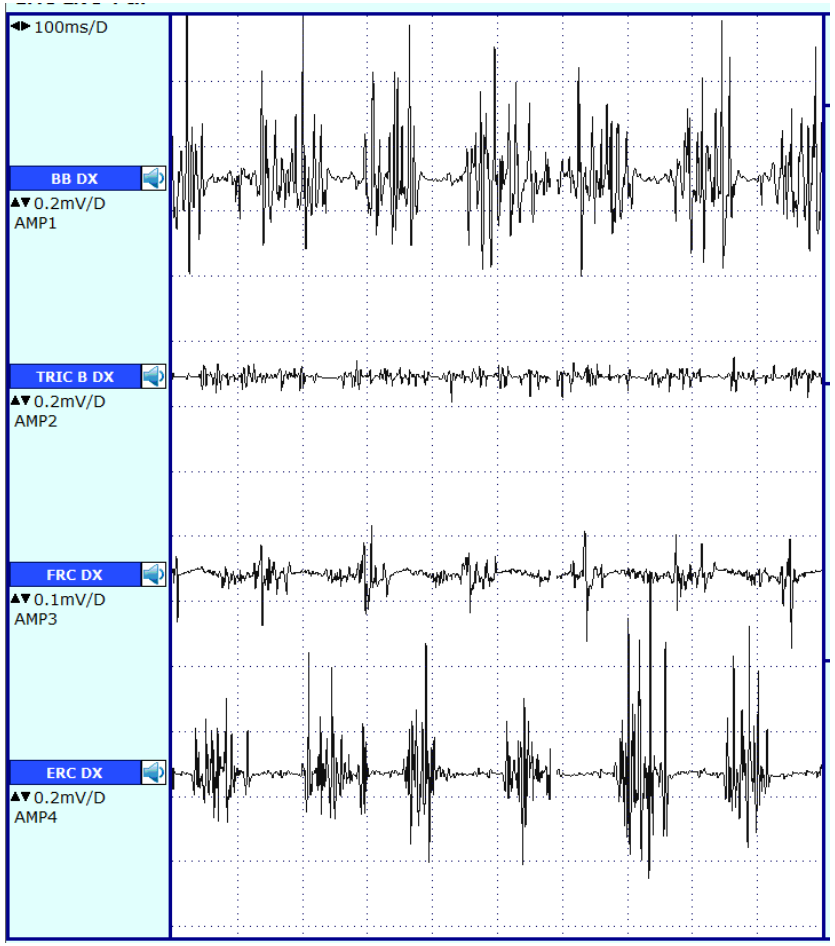
Caso clinico 1

Pz di 50aa sottoposta a trapianto renale, in tacrolimus
Comparsa progressiva di tremore posturale e cinetico agli arti

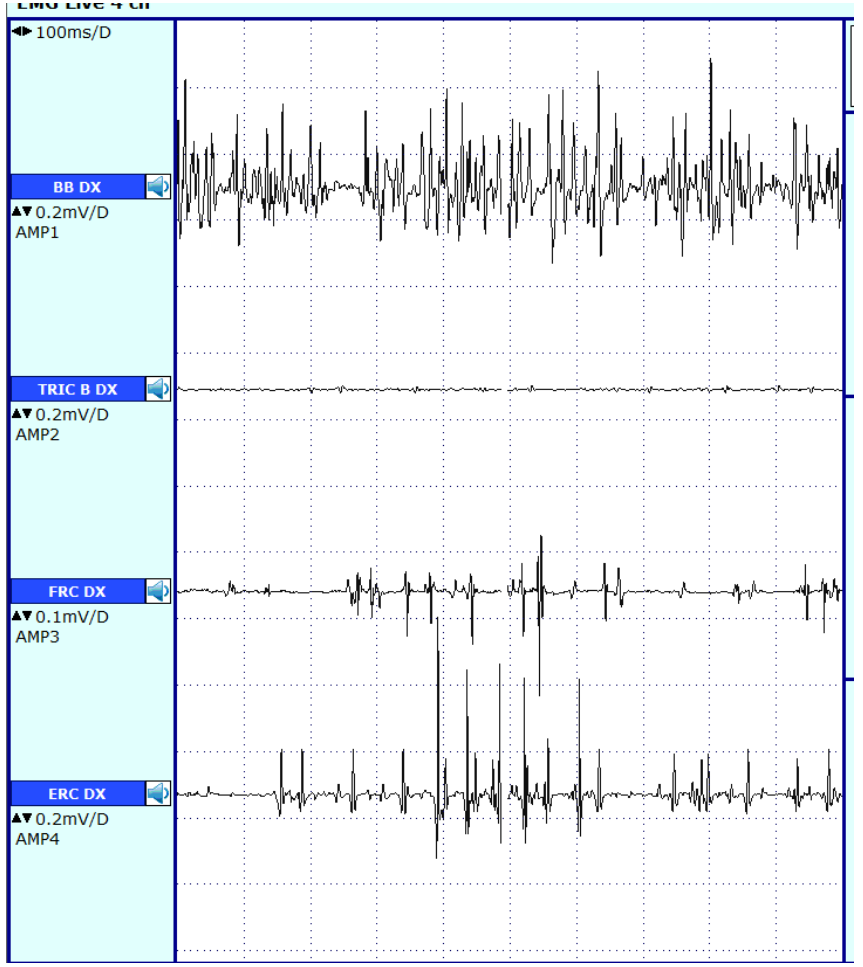
RMN cerebrale: vasculopatia cerebrale cronica

EON normale

Posizione primaria



Grafoestesia



Caso clinico 2

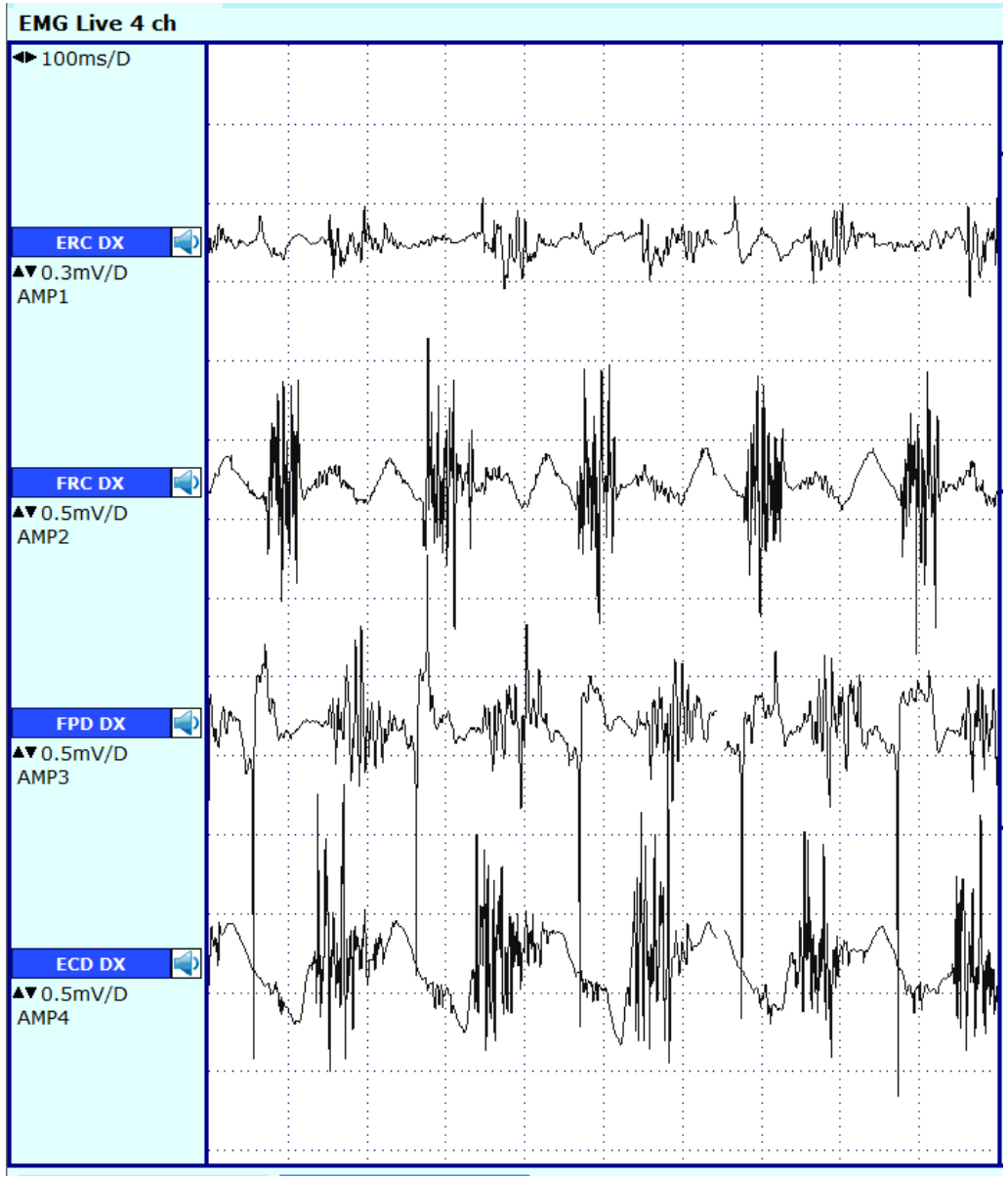
Uomo di 52aa
APR TEP da mutazione di fattore V Leiden, in TAO
Famigliarita’ per tremore (nonna materna)

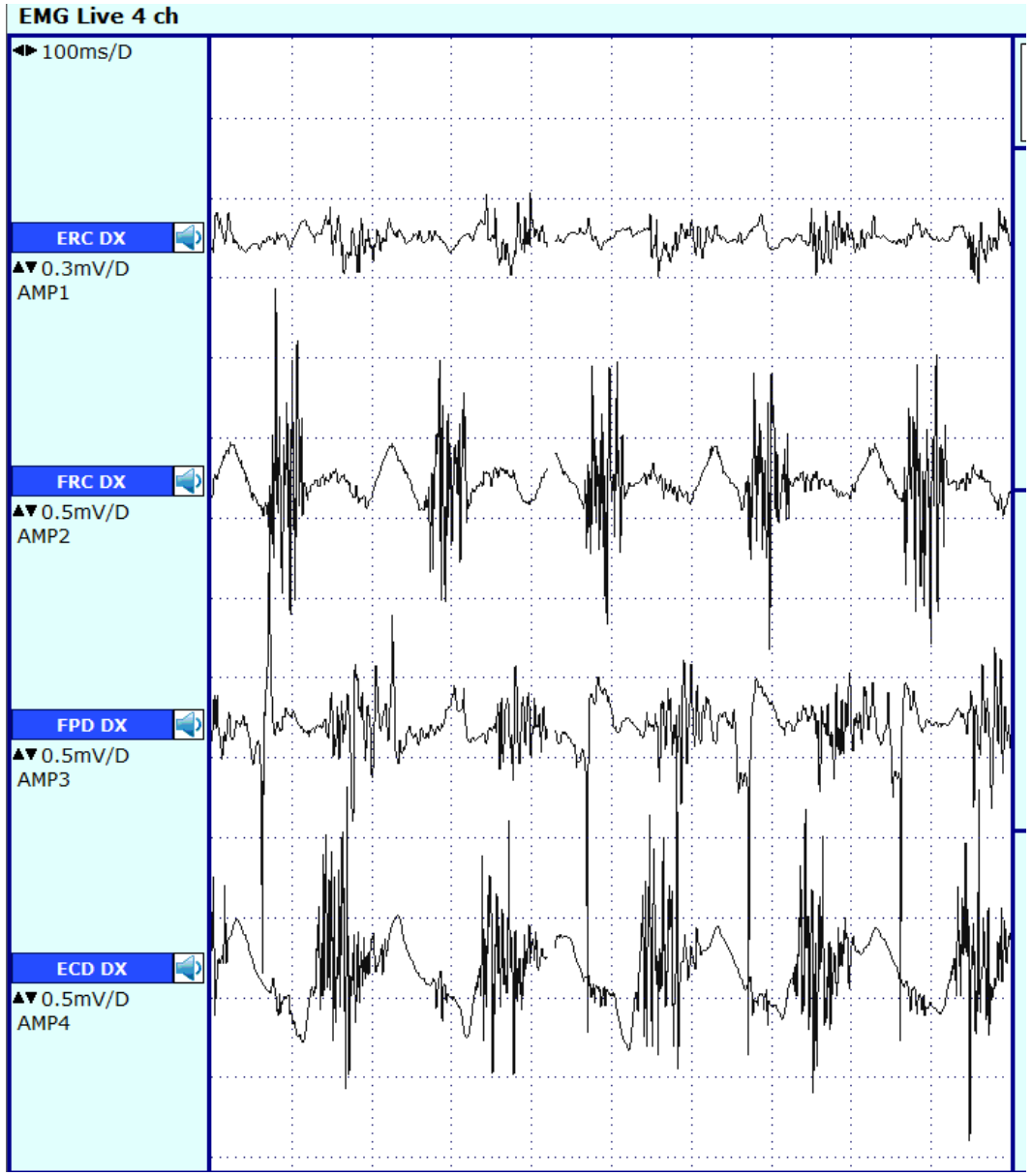
Fin dalla giovane eta’ tremore prevalentemente cinetico e posturale alla mano dx
Qualche mese prima peggioramento del tremore associato a dolore, regredito parzialmente con pregabalin. Nessuna modifica con alcool.
A causa del tremore il pz e’ stato licenziato (movimentazione di muletti da carico)

Eseguita SPECT DAT SCAN e RMN cerebrale negativa

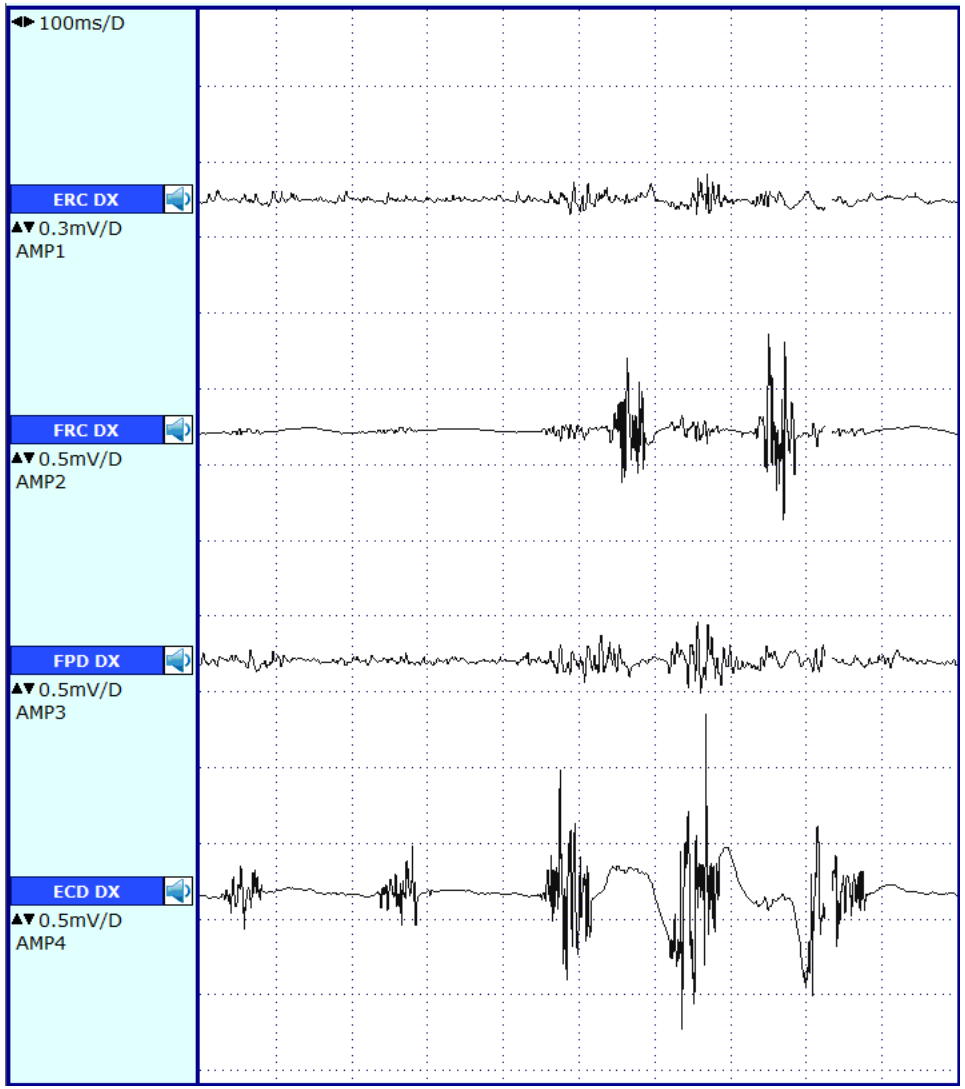
EON deambulazione senza caratteri patologici, non deficit di forza e sensibilita’, non bradicinesia ne’ rigidita’

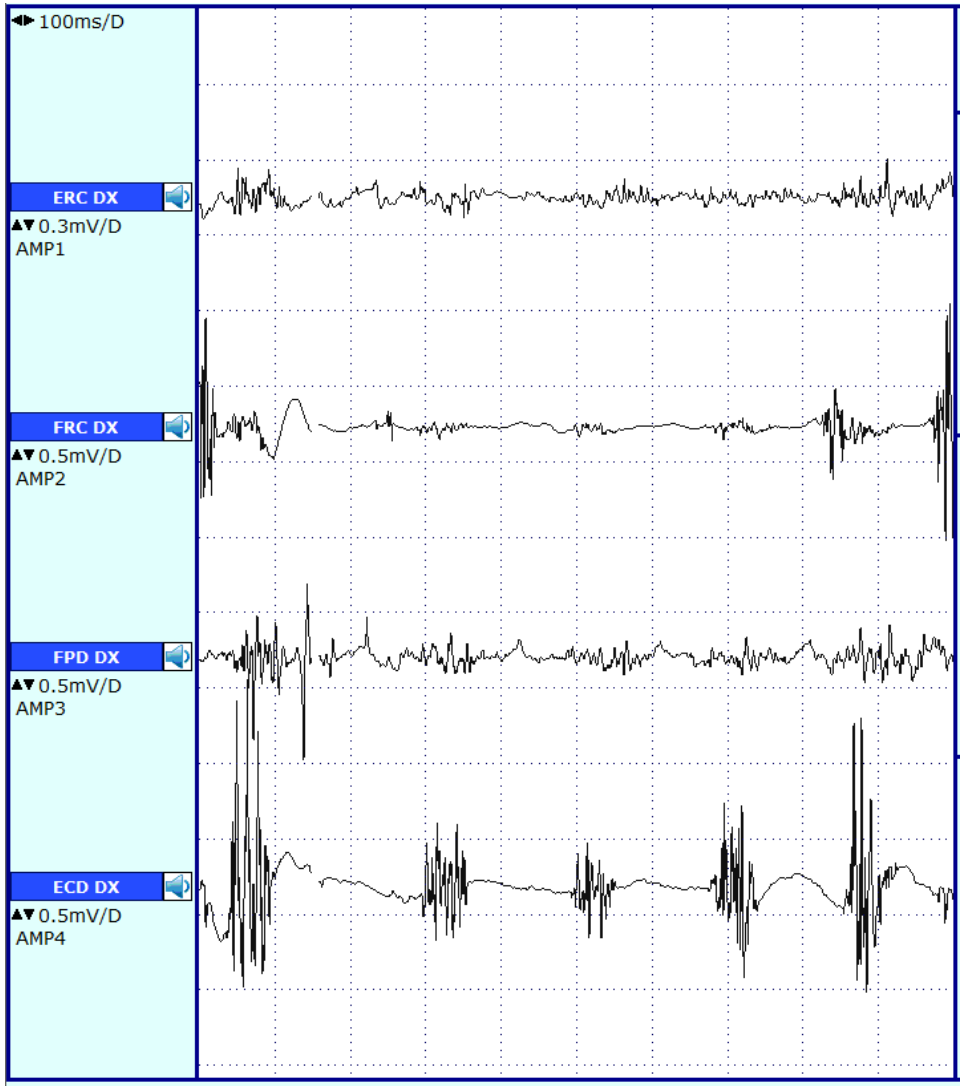
Posizione primaria



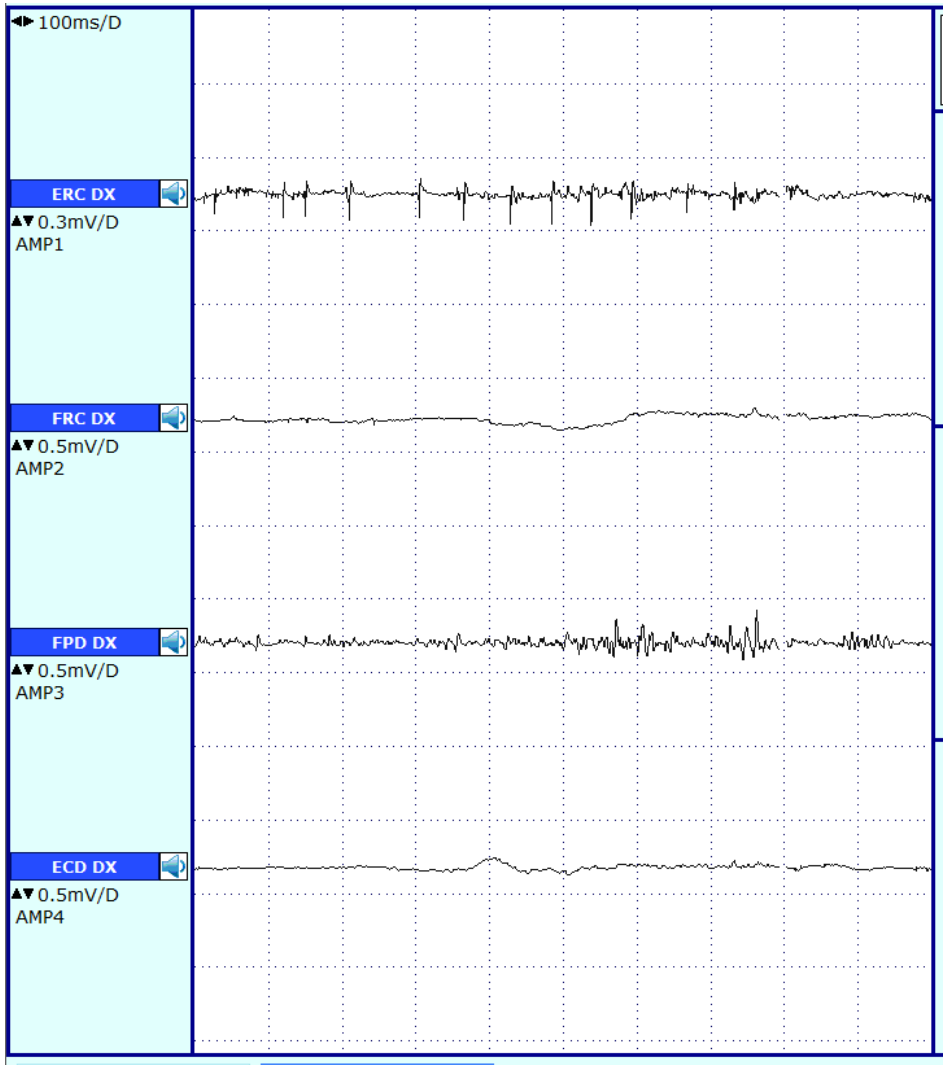


Entrainment 2Hz

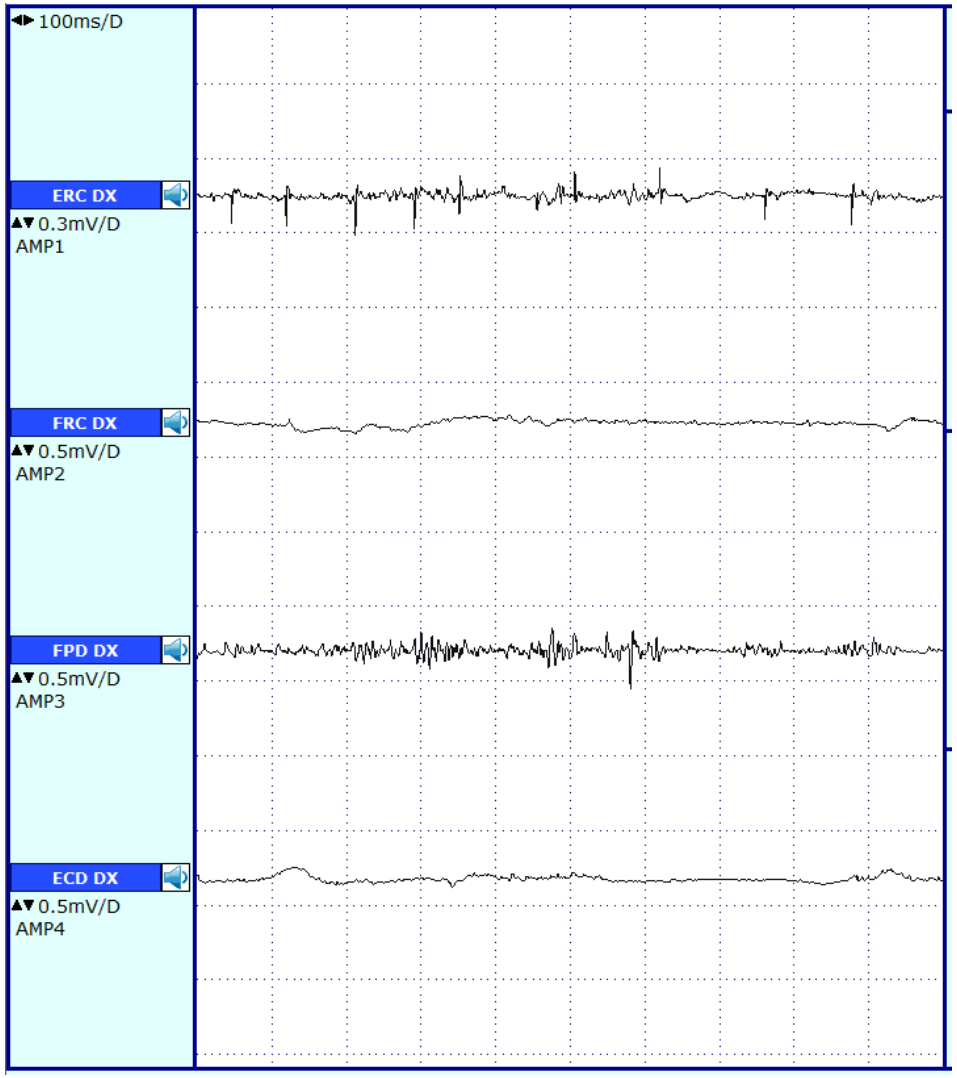




Task motori

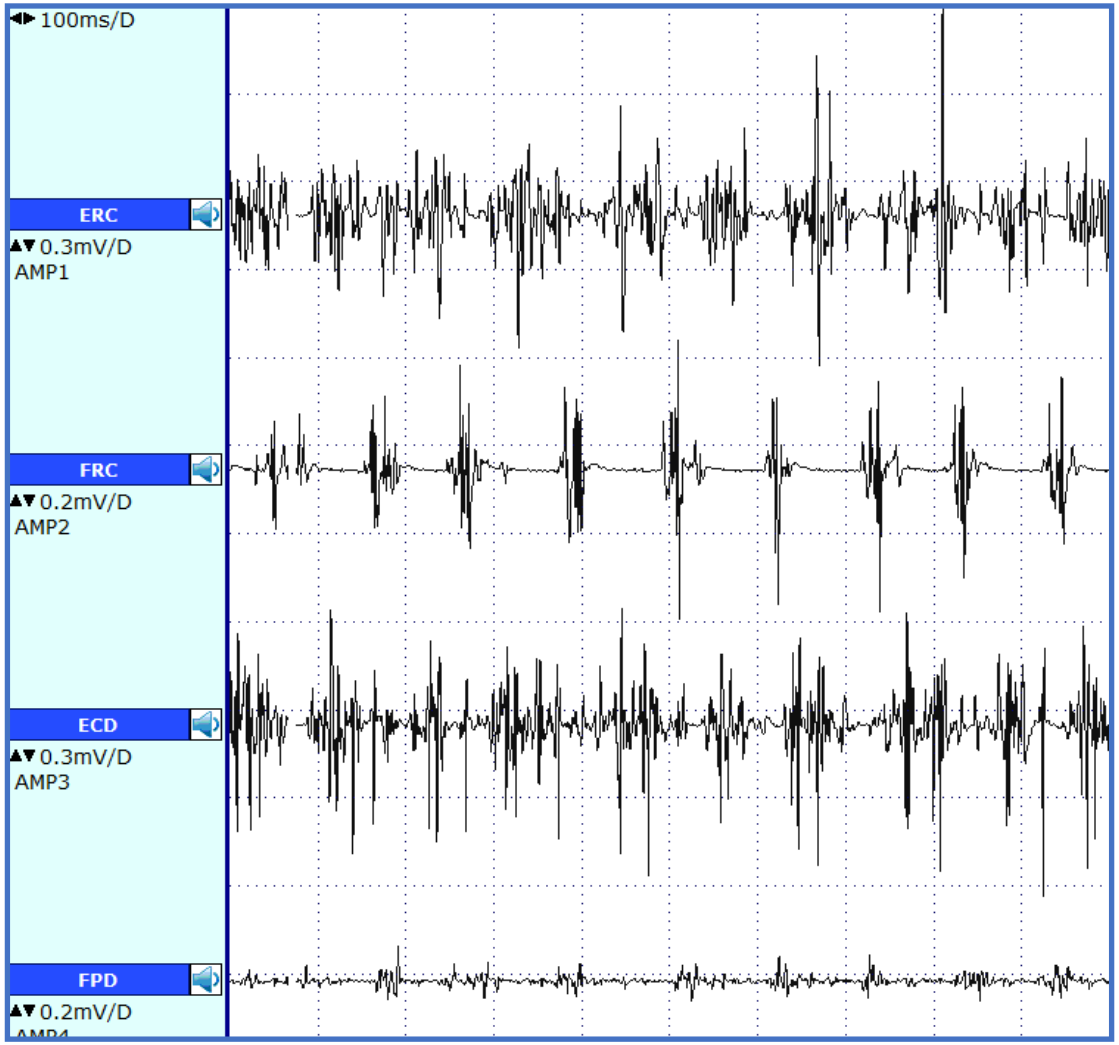


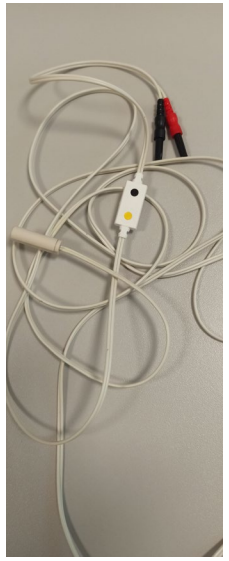
Indice naso

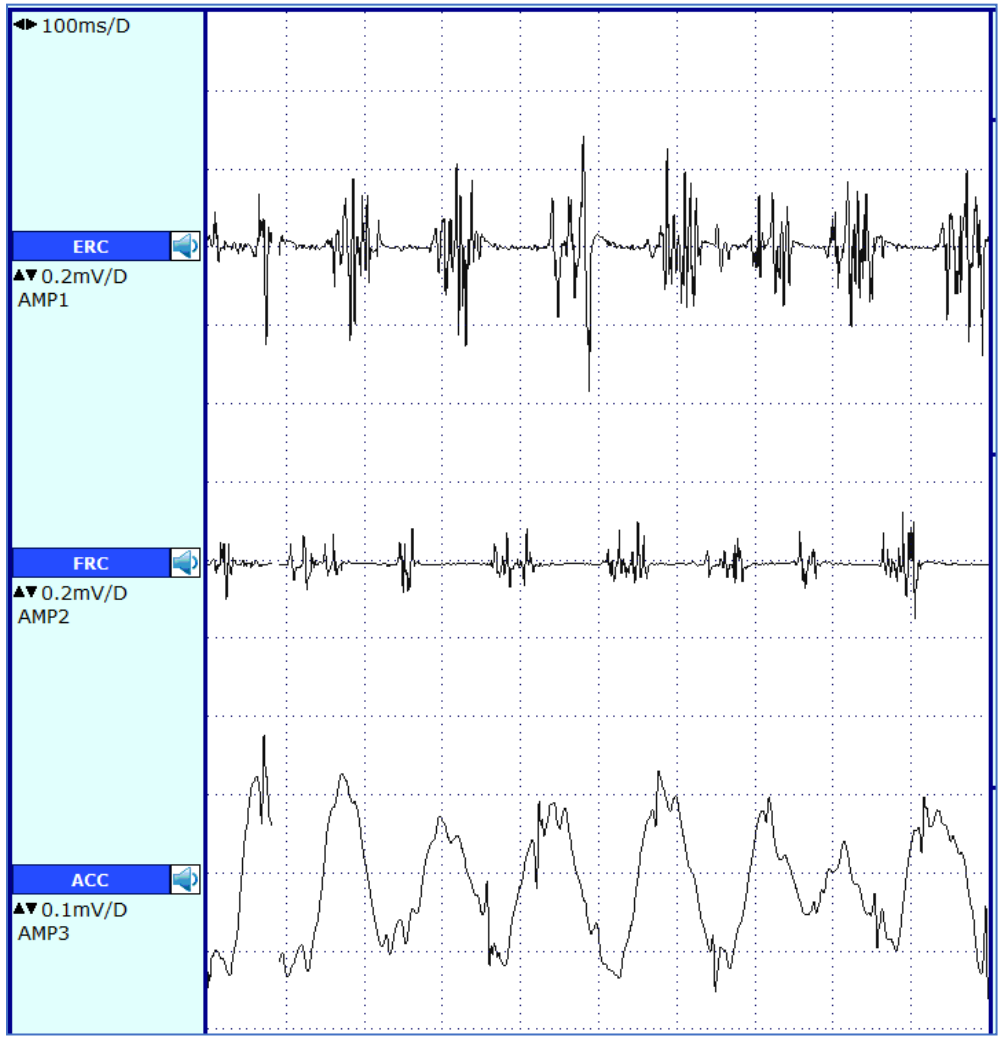


Caso clinico 3

Donna di 26aa, riferito tremore cinetico ad insorgenza acuta dopo trama distorsivo da caduta da cavallo



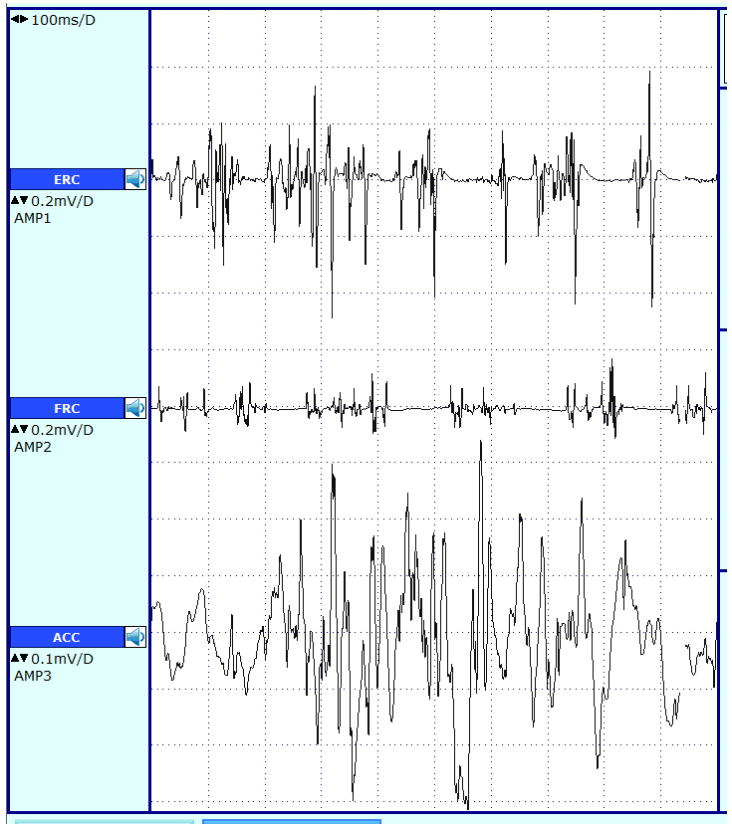


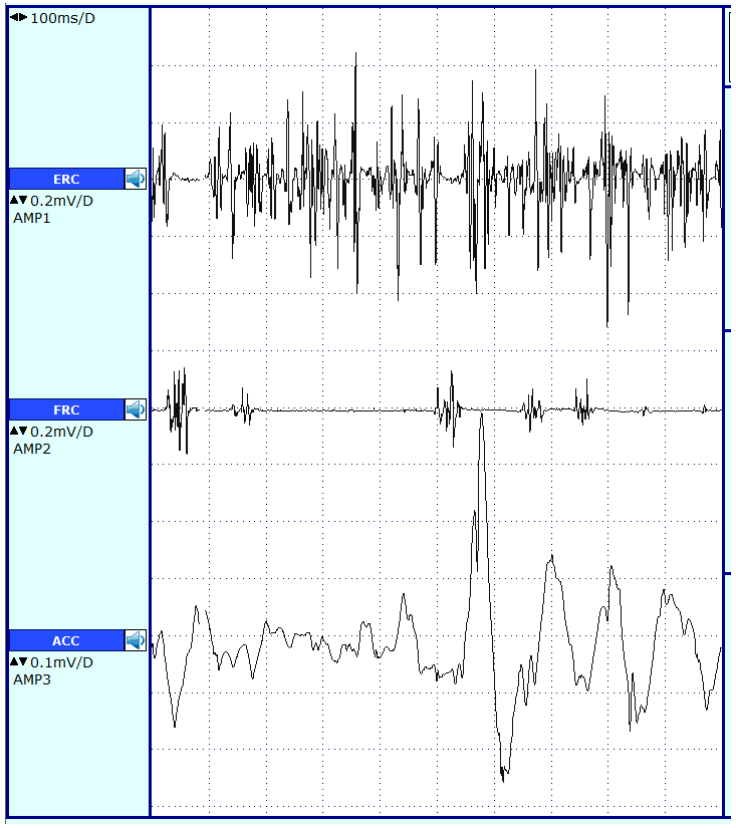


Posturale

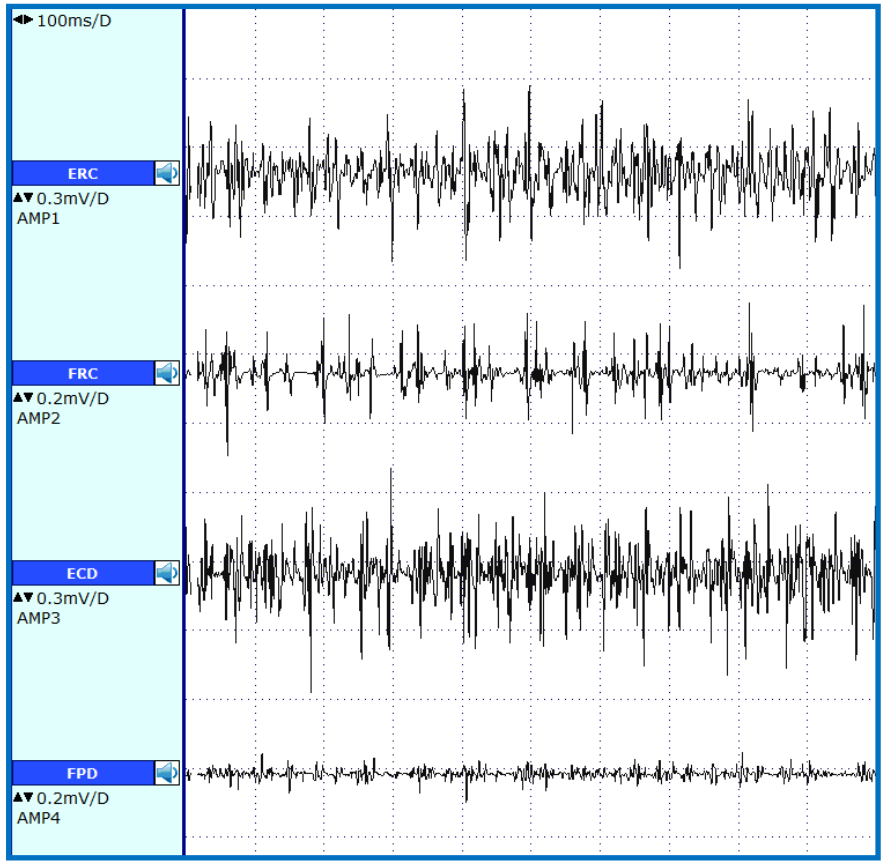
Dopo carico 1kg

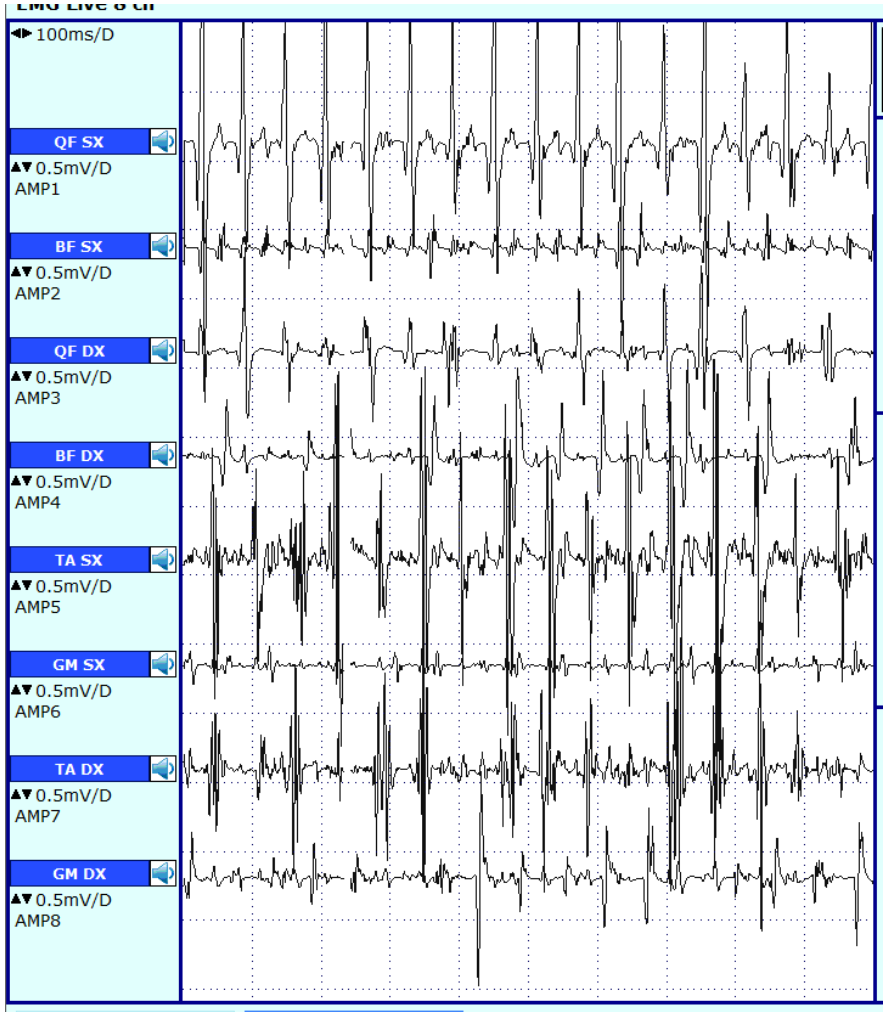
Entrainment 2Hz





Entrainment 4Hz





Cosa e’?

Puo’ essere funzionale?

Functional myoclonus

Clinical

Too slow or too complex

Sensitive to entrainment

Distractibility

Neurophysiology

Long duration of EMG pattern (> 1 sec)

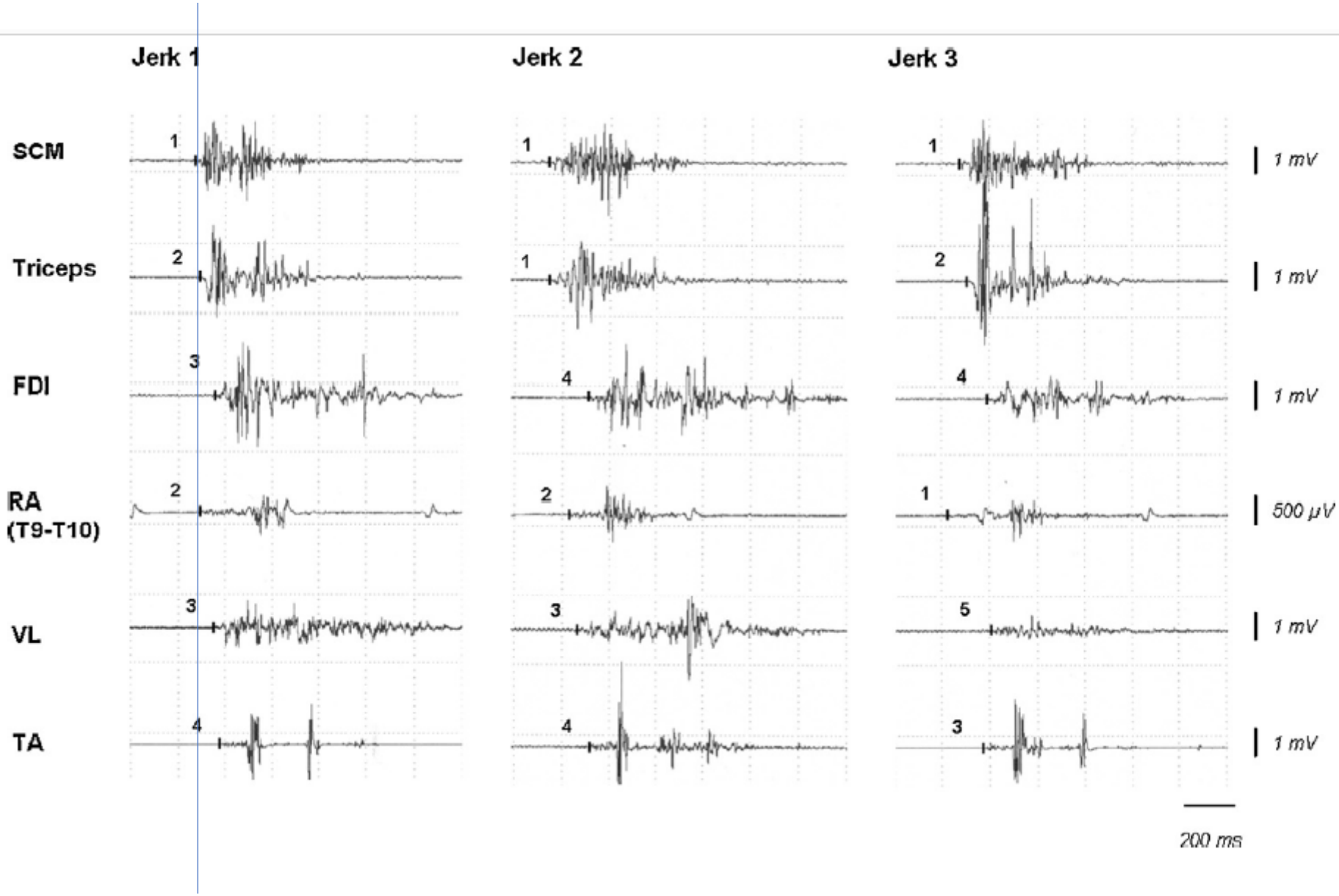
Inconsistent recruitment pattern

(Sensitive to entrainment)

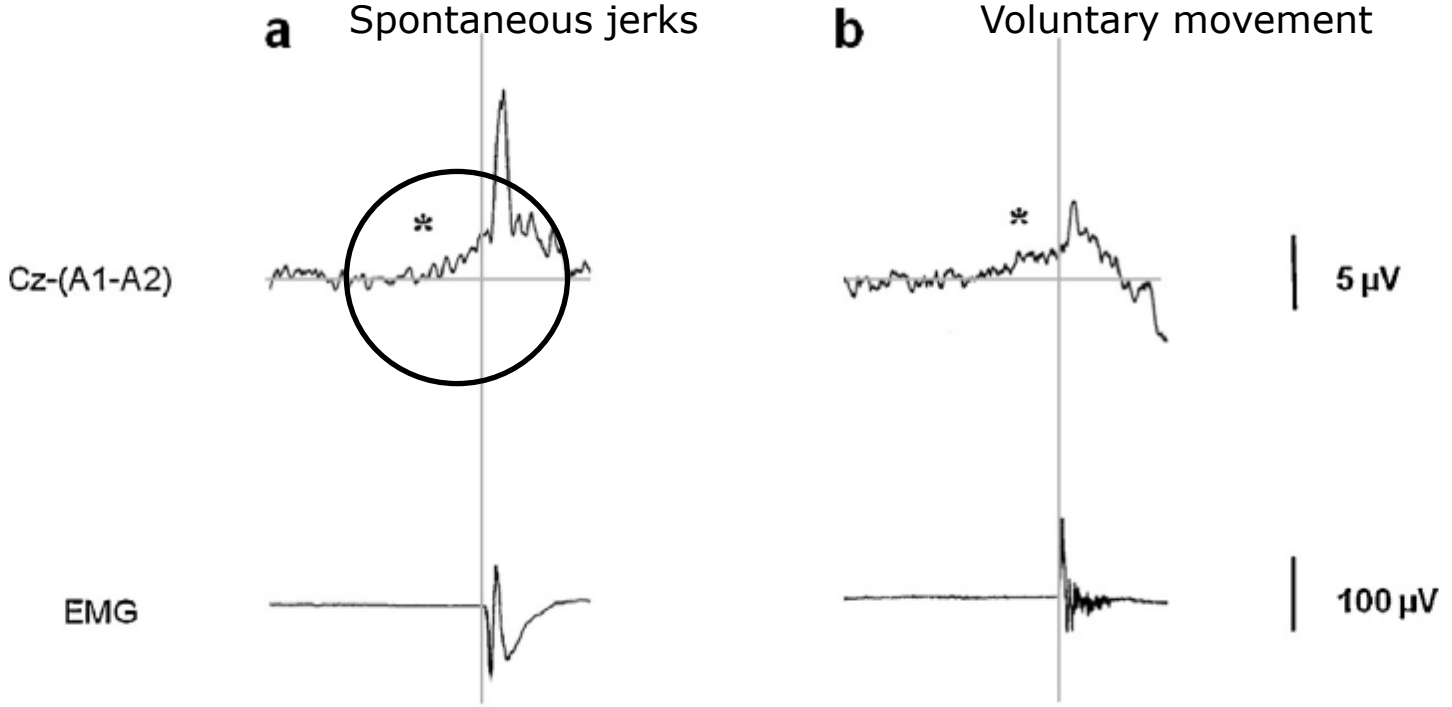
Bereitschaftspotential (premovement potential)

If st. sensitive, long (>100msec) and variable stimulus response delay (startle), abituation

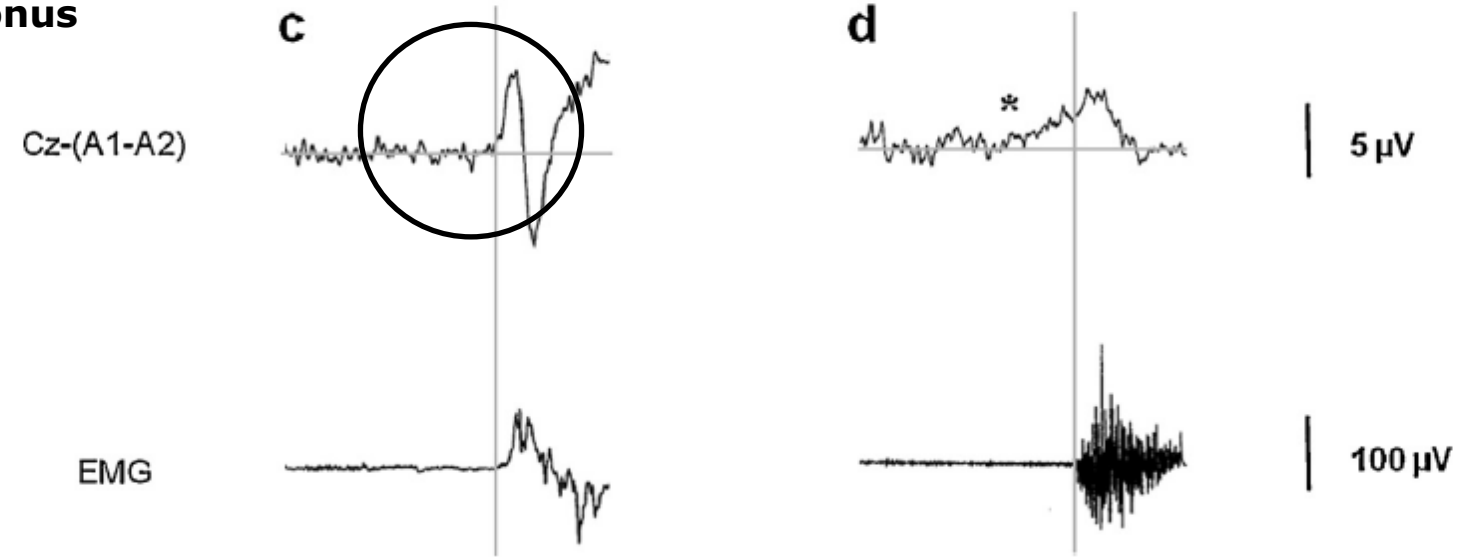
Apartis 2014



Psychogenic jerks



Propriospinal myoclonus



Apartis 2014

Functional dystonia

Clinical

Fixed or not

Neurophysiology

<u>Sharing with organic (vs controls)</u>

Reduced spinal reciprocal inhibition *(Espay et al, 2006)*
Reduced SICI *(Espay et al, 2006; Avanzino et al, 2008)*
Reduced LICI *(Espay et al, 2006)*
Reduced CSP *(Espay et al, 2006; Avanzino et al, 2008)*
Reduced temporal discrimination *(Morgante et al, 2011)*

<u>Difference with organic</u>

BR recovery curve *(Janssen et al, 2014; Schwingenschuh et a, 2011)*
Paired associative stimulation *(Quartarone et al, 2009)*

Caso clinico

Insegnante di spagnolo di 60aa, ipertesa da anni

Dopo prima dose di vaccino il 15-3-2021, a distanza di qualche ora, comparsa di tensione muscolare laterocervicale con estensione alla mandibola, associata a dolore

Eseguite diverse visite odontoiatriche, ha portato bite e apparecchi dentari

Dopo qualche mese comparsa di movimenti involontari alla bocca ed eloquio impastato per riferito coinvolgimento della lingua. Eseguiti diversi trattamenti, clonazepam, tetrabenazina, amitriptilina senza beneficio

In aprile 2022 si presenta in PS e viene sottoposta a trattamento con TOX bot (5U m digastrico bilateralmente, 10U m pterigoideo esterno bilateralmente) senza beneficio

Functional oromandibular dystonia (FOMD)

Fasano et al, 2016

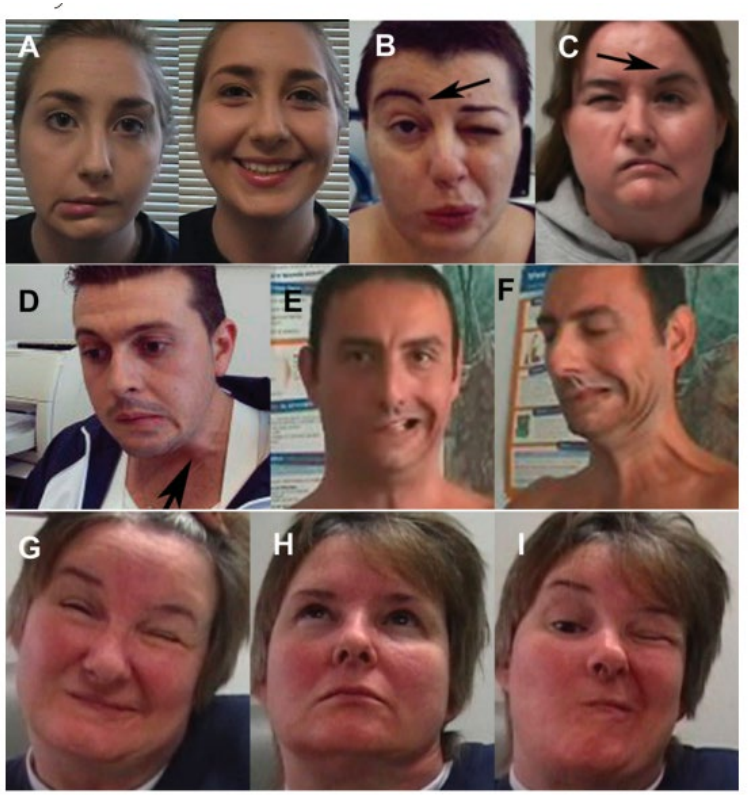
Table 31.3

Features distinguishing organic vs. functional oromandibular and facial dystonia

	Organic	Functional
Onset and progression	Gradual, slow progression	Sudden onset, static course
Sensory tricks	May be present	Rarely present
Most common distribution	Lips	Jaw, eyelids
Most common sidedness	Bilateral	Unilateral
Platysma involvement	Very rare, bilateral	Common, ipsilateral
OOc and frontalis muscle involvement (if present)	OOc and frontalis, ipsilateral	OOc and frontalis, contralateral*
Dystonic pattern	Phasic	Tonic
Dystonic exacerbation	Action-induced	Paroxysmal, maximum at rest
Dystonic spread	Segmental to cervical region	Segmental or multifocal
Evolution	Slowly progressive, no spontaneous exacerbations or remissions	Fluctuations in severity, spontaneous exacerbation and remissions
Pain	Usually absent	Often present

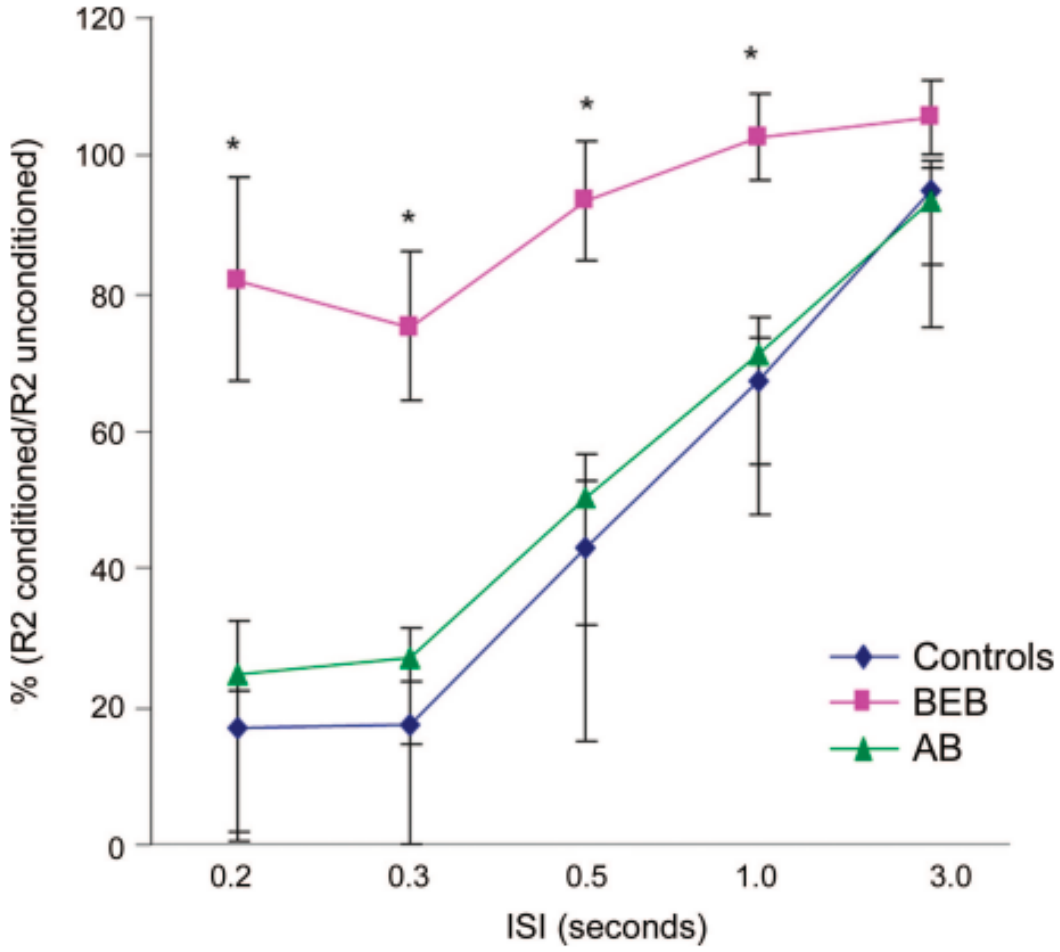
Reproduced from Fasano et al. (2012).

*If orbicularis oculi (OOc) present in isolation, it most often occurred contralateral to the affected lip/jaw.

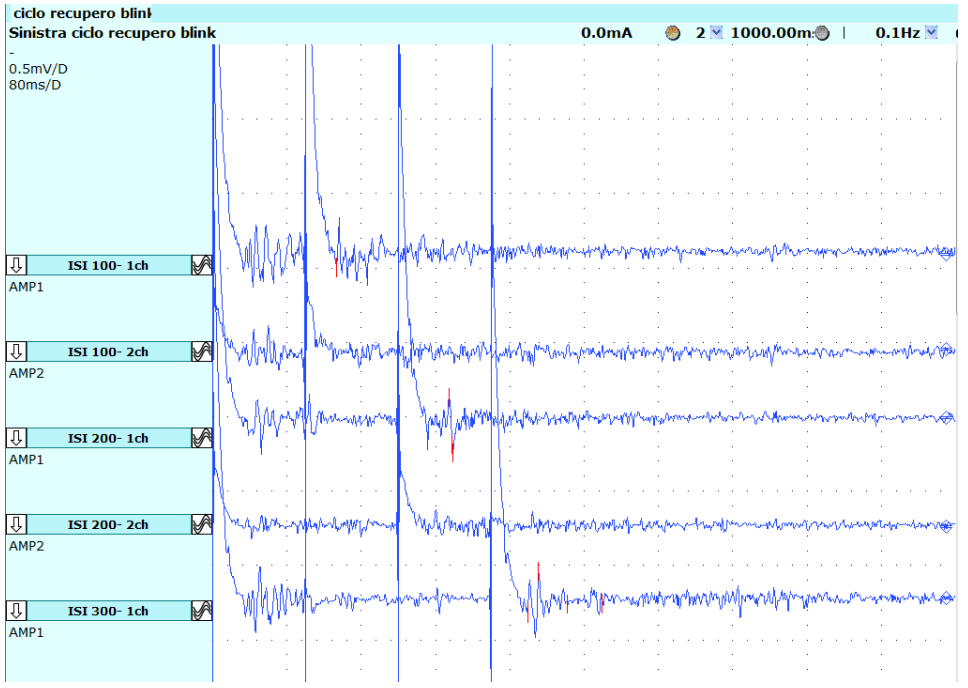


Fasano et al, 2012

Figure 1 **Blink reflex recovery cycle**



Blink reflex recovery cycle of the R2 component (area) in controls and patients with benign essential blepharospasm (BEB) and atypical (presumed psychogenic) blepharospasm (AB). Means are shown for the ratio of the conditioned R2 component to the unconditioned response. Error bars represent standard errors for the estimated least-squares means. *Significant difference between BEB vs controls and AB at a 5% level. X-axis: interstimulus intervals (ISI) in seconds. Y-axis: ratio of the conditioned to the unconditioned R2 response in percentage (%).



Functional seizures (Psychogenic nonepileptic seizures (PNES)

Psychogenic nonepileptic seizure semiologic features	
Long duration	Duration over 2 min. Use with caution, as alternative is status epilepticus
Fluctuating course	Intervening pauses, waxing/waning event tempo
Specific ictal movements or characteristics	Asynchronous or side-to-side movements, pelvic thrusting (can also be seen in frontal lobe seizures), ictal crying
Eye closure	Often against resistance of examiner
Increased ictal awareness	Postictal recall of information presented ictally
Postictal features	Absence of postseizure confusion
Response to external stimuli	Bystanders may be able to alleviate or intensify the ictal event

Anderson et al, 2019

Fluctuating course

Side-to-side head shaking

Asynchronous limb movements, pelvic thrusting

Longer duration (over 2min)

Eyelids closed with resistance to opening

Opisthotonus

Crying, no post-ictal confusion

Examination Features	Common in PNES, Rare in ES	Common in ES, Rare in PNES	May Be Present in Either
Eyelids and pupils			
Closed	Yes	No	No
Open	No	Yes	No
Fluttering	No	No	Yes
Resistance to eyelid opening	Yes	No	No
Absent light reflex	No	Yes	No
Preserved pupil reflex	No	No	Yes
Eyes rolled up	No	No	Yes
General phenotype			
Duration longer than 2 min	Yes	No	No
Opisthotonus	Yes	No	No
Asynchronous limb movements	Yes	No	No
Side-to-side head shaking	Yes	No	No
Prolonged event with falling down and lying still with eyes closed	Yes	No	No
Guttural cry at onset	No	Yes	No
Visible tongue bite	No	Yes	No
Synchronous limb movements	No	Yes	No
Clonic jerking	No	Yes	No
Highly stereotyped movements[a]	No	Yes	No
Self-injury	No	No	Yes
Urinary incontinence	No	No	Yes
Report of tongue biting	No	No	Yes
Nocturnal seizures	No	No	Yes
Postictal behaviors	Yes	No	No
Rapid reorientation	Yes	No	No
Prolonged atonia	Yes	No	No
Whispering	Yes	No	No
Crying	Yes	No	No
Slow reorientation	No	Yes	No
Stertorous breathing	No	Yes	No
Impaired communication	No	No	Yes

Espay et al, 2018

Caso clinico 1

Donna di 35 aa, sviluppo somatopsichico regolare, non convulsioni febbrili nell'infanzia. In APR sindrome ansioso-depressiva in terapia. Non lavora.

Dal 2003 episodi di formicolio emisoma sx della durata di pochi minuti, a frequenza di un mese (coscienza integra); dal 2013 riferiti episodi di visione offuscata; iniziata cbz poi sospesa per intolleranza; poi iniziato levetiracetam e lacosamide; EEG ripetuti normali. RMN normale.

Diagnosi di epilessia farmacoresistente.

Caso clinico 2

Ragazzo di 17 aa, sviluppo somatopsichico regolare, non convulsioni febbrili nell'infanzia.
In APR cefalea tensiva durante infanzia. Studente scuola media superiore.

Da un anno episodi in cui non riesce a parlare, di qualche secondo, con associata modificazione della frequenza respiratoria; da qualche mese gli episodi sono diventati quotidiani, il pz e' cosciente e ricorda tutto.
EEG basale normale, RMN cerebrale normale.