Video Rounds: Differentiating Organic from Functional Movement Disorders

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- No disclosure

Objectives

- **Review** Functional Movement Disorder (FMD) and its key clinical features
- **Identify** characteristic signs of FMD
- **Develop** a systematic approach to improve diagnostic accuracy through video case examples

Case

- A 62-year-old man referred for evaluation of tremor
- Onset 4-5 yrs ago
- No hand tremor
- Tremor occurs while sitting and standing, no tremor when walking
- Suspected Parkinsonism – tried dopamine agonist, amantadine without benefit.
- MRI brain, C/T spine - normal

Functional Movement Disorders

- FMD

  A spectrum of neurological symptoms characterized by abnormal movements that are inconsistent and incongruent with known movement disorders and cannot be explained by structural or degenerative neurological disease.

- Subgroup of Functional neurological disorders (FND).

Terminology

Panel: History of terminology and perspectives of functional (psychogenic) disorders, through ages.

Term	Major influence	Clinical implications and psychopathology
Hysteria	Hippocrates of Kos (460–370 BCE)	The word "hysteria" is attributed to Hippocrates in the *Corpus Hippocraticum* (4th/3rd centuries BC), although whether the term was coined by Hippocrates himself is doubtful. The word hysteria was used to explain several gynecologic and other medical symptoms suspected to be linked to the womb (uterus). The concept of a "wandering womb" causing several symptoms influenced medicine for the next 500 years.
	Edward Jorden (1569–1633)	Jorden recognizes hysteria as a mental illness after centuries of view as a sign of witchcraft, following publication of the book *Malleus Maleficarium* in the late 1400s
	Thomas Willis (1621–1675)	T. Willis is one of the first authors proposing a central role of the brain in hysteria, following the influence of "vapours rising into the head from the uterus and the spleen"
Hysteria	Paul (or Pierre) Briquet (1796–1881)	Briquet in his book *Traité clinique et thérapeutique de l'Hystérie* (1859), he rejected uterine theories and influenced Charcot's work on hysteria.
	Jean-Martin Charcot (1825–1893)	J-M Charcot through clinical anatomical correlations separated organic disorders from the "neuroses" which included hysteria. His viewpoint "dynamic nervous system lesion". He emphasized the role of minor trauma triggering the hysteric symptoms. Charcot used hypnosis as an experimental method to study hysterics, separated malingering from hysteria and made detailed description of male hysteria.
Dissociative disorders	Pierre Janet (1859–1947)	Janet introduced the concept that "fixed ideas" acting in the unconscious mind, with dissociation of the conscious and unconscious mind by emotional states or hypnosis.
Conversion disorders	Sigmund Freud (1856–1939)	Freud introduced the concepts of repression of traumatic events and transformation (or conversion) of a psychological unconscious conflict into a symbolic physical manifestation.
Psychogenic Disorders	Several authors	Terminology used among neurologists and movement disorders specialists. It implies that the disorder derives from the mind, a concept recently challenged. Fahn and Williams introduced diagnostic criteria for FMDs in 1988.
Functional disorders	Several authors	An old terminology, recently reintroduced, which is gaining acceptance in the fields of neurology and psychiatry. Avoids the dualism between mind and brain, and patients may find more acceptable than "psychogenic", but it lacks specificity.

Baizabal-Carvallo et al., 2019

A Clinical Lesson at the Salpêtrière" (1887) by **André Brouillet**

- ”Functional Neurological disorder” is preferred in DSM V.

- Reflects understanding that symptoms are real with underlying *abnormalities in brain/network function.*

DSM-5-TR diagnostic criteria for functional neurological symptom disorder (conversion disorder)

A. One or more symptoms of altered voluntary motor or sensory function.
B. Clinical findings provide evidence of incompatibility between the symptom and recognized neurological or medical conditions.
C. The symptom or deficit is not better explained by another medical or mental disorder.
D. The symptom or deficit causes clinically significant distress or impairment in social, occupational, or other important areas of functioning or warrants medical evaluation.
Specify symptom type:
With weakness or paralysis
With abnormal movement (eg, tremor, dystonic movement, myoclonus, gait disorder)
With swallowing symptoms
With speech symptoms (eg, dysphonia, slurred speech)
With attacks or seizures
With anesthesia or sensory loss
With special sensory symptoms (eg, visual, olfactory, or hearing disturbance)
With mixed symptoms

Functional Movement Disorders

- Common cause of undiagnosed neurological syndrome.
- FND - 2nd most common reason for neurology clinic visit (2-20% in movement clinic).
- Common in women (60-70%)
- Diagnosis is often delayed or missed.
- Longer duration of symptoms is associated unfavorable prognosis.

Espay et al., JAMA Neurol 2018; Serranová et al., Neurol Clin 2023.

FMD: Clinical Features

- FMD can mimic any organic movement disorders.

  - Functional tremor (most common)
  - Functional dystonia
  - Functional gait disorders
  - Functional facial spasms
  - Functional myoclonus
  - Functional parkinsonism
  - Functional tics

- Mixed manifestations – common

Diagnosis of FMD

✓ Rule-In Diagnosis

- Observe for positive signs
- Neurophysiology testing may help in some cases
- Rate of misdiagnosis is low (~ 4%)

X NOT A diagnosis of Exclusion

- “Normal investigations” as a sole proof to make a diagnosis
- Ruling out other diagnosis

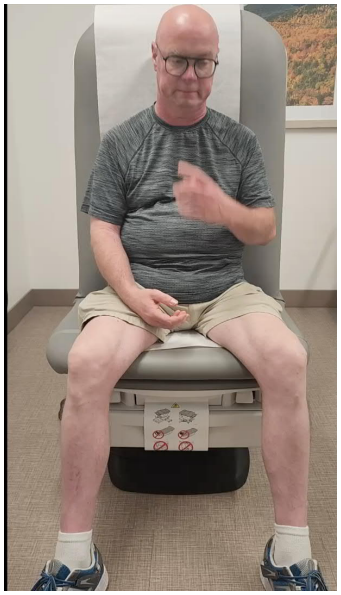
Stone et al., Brain 2009; Espay et al., JAMA Neurol 2018; Serranová et al., Neurol Clin 2023.

FMD: Clinical clues

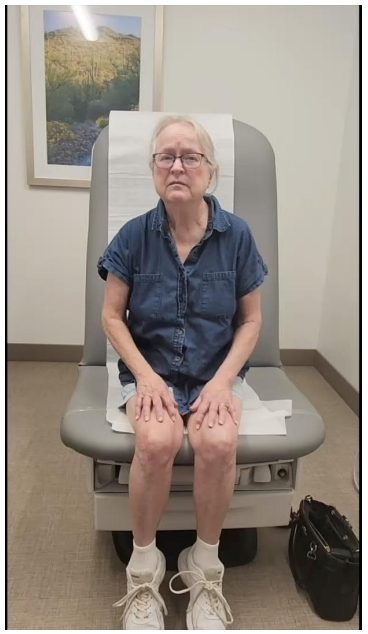
- Sudden onset
- Progression to maximum symptoms is rapid
- History of precipitating event
- Functional disability out of proportion to symptoms and exam findings
- Inconsistency:
  - Variability in movement characteristic (amplitude, frequency, distribution)
  - Variability in symptoms over time
  - Significant fluctuations
  - Distractibility
- Incongruency: symptoms and signs incompatible with organic movement disorders

Espay et al., JAMA Neurol 2018; Serranová et al., Neurol Clin 2023.

Functional tremor



Functional tremor



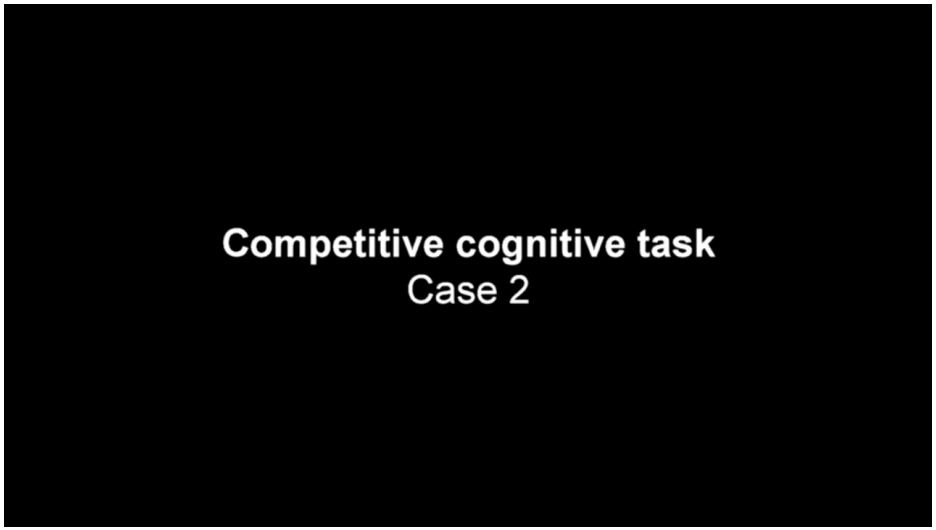
ET

Functional tremor

Sudden development of functional tremor in ET patient with DBS after head injury

- Hand and leg are common sites.
- Distractibility – suppression of tremor with motor or cognitive task.
- Variability – change in tremor frequency, direction and amplitude.
- Entrainment – change in tremor frequency to match a rhythmic movement in another body part.
- Difficulty in performing competitive motor task.
- Huffing-puffing sign
- Co-contraction of agonist antagonist muscles
- Increase in tremor amplitude with weight load.
- Functional tremor can co-exist with neurological disorder

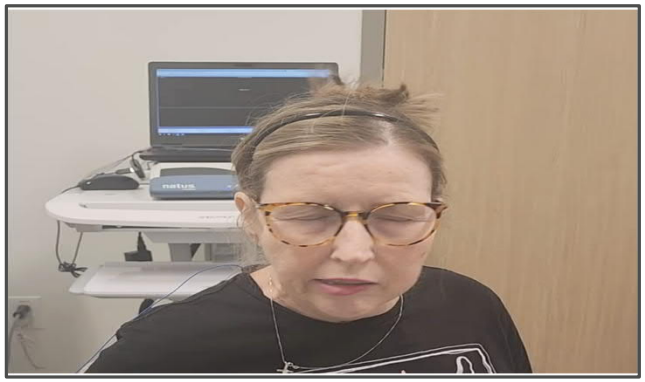
Cessation of tremor with ballistic movements.

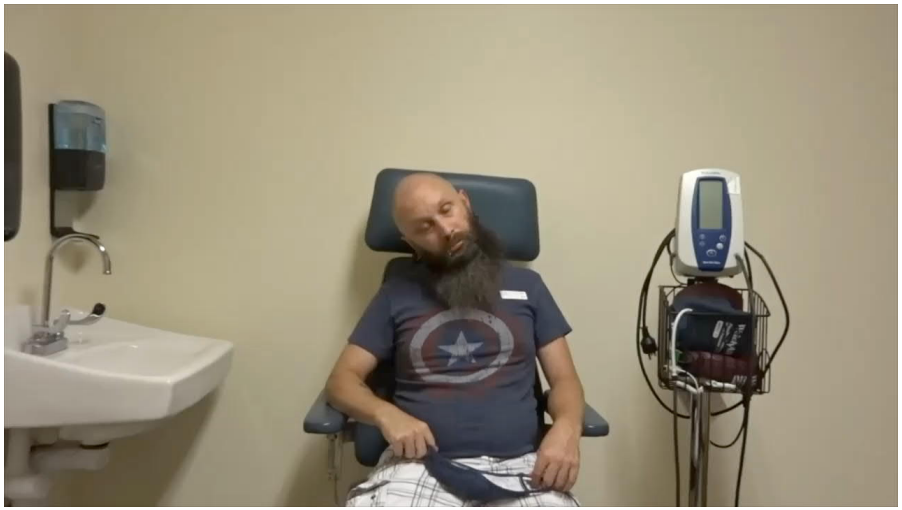


Cessation with Complex motor task

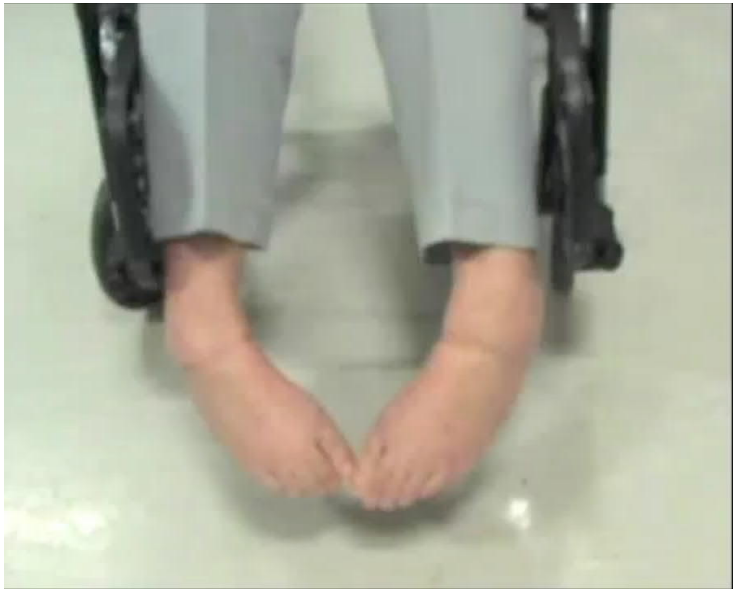
Serranová et al., Neurol Clin 2023.

Functional Dystonia





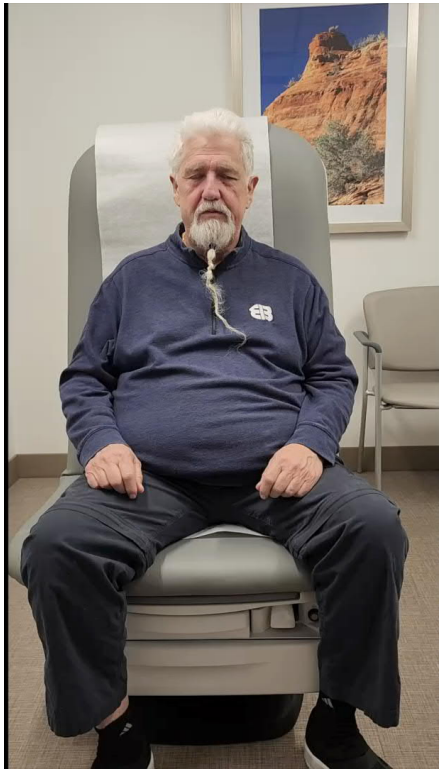
Functional Dystonia



Ganos et al. MDCP 2014

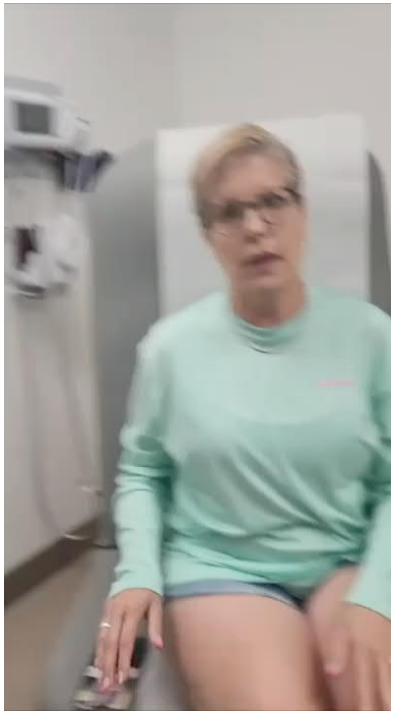
- Sudden or rapid development of symptoms
- Variability in phenomenology, progression, duration
- Fixed posture
- Unilateral tonic pulling of facial muscles.
- Associated with severe pain

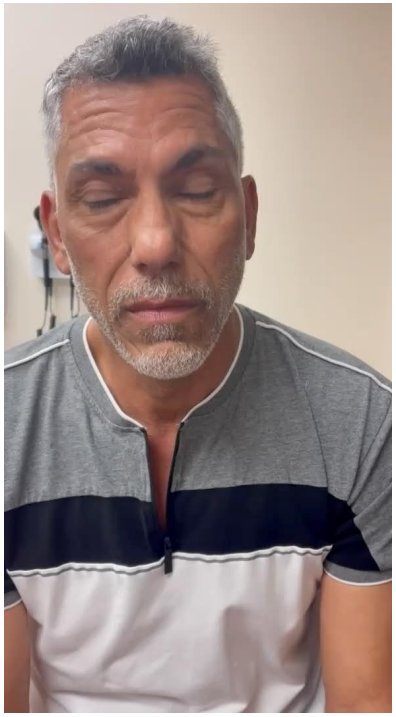
Functional Myoclonus



- Variability in duration of jerks
- Distractibility and entrainment

Functional facial movement disorders





- Tonic pulling of one side of face/lip, often with platysma activation
- Constant tonic eye closure
- Spasm are prolonged
- Absence of ”other Babinski sign”
- Distractibility
- Lack of synchronicity between lower and upper facial muscles
- Poor response to botulinum toxin injections

CLINICAL/SCIENTIFIC NOTES | July 23, 2007

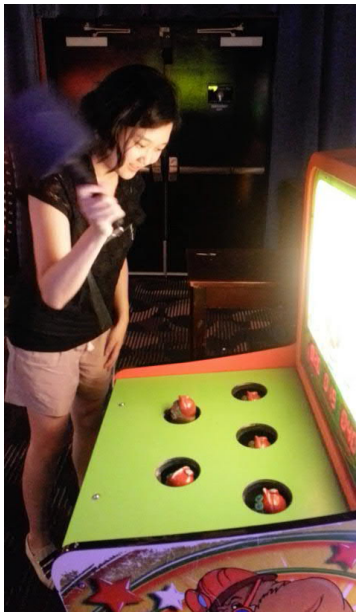
THE OTHER BABINSKI SIGN IN HEMIFACIAL SPASM

William Stamey, MD, and Joseph Jankovic, MD | AUTHORS INFO & AFFILIATIONS

July 24, 2007 issue • 69 (4) 402-404 • https://doi.org/10.1212/01.wnl.0000266389.52843.3b

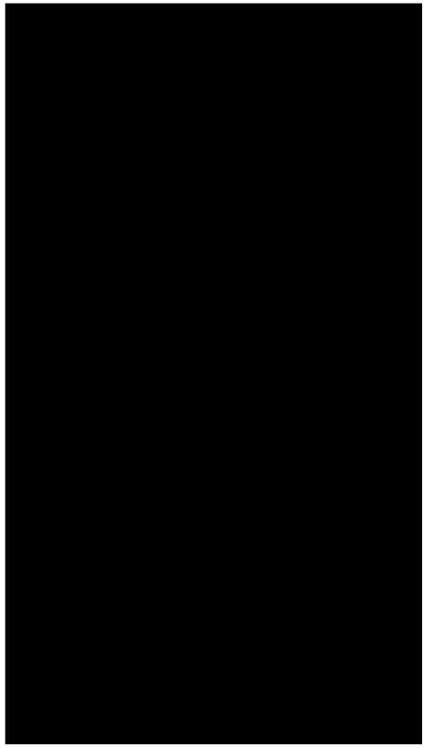
Movement Disorders
CLINICAL PRACTICE
CASE SERIES

The “Whack-a-Mole” Sign in Functional Movement Disorders



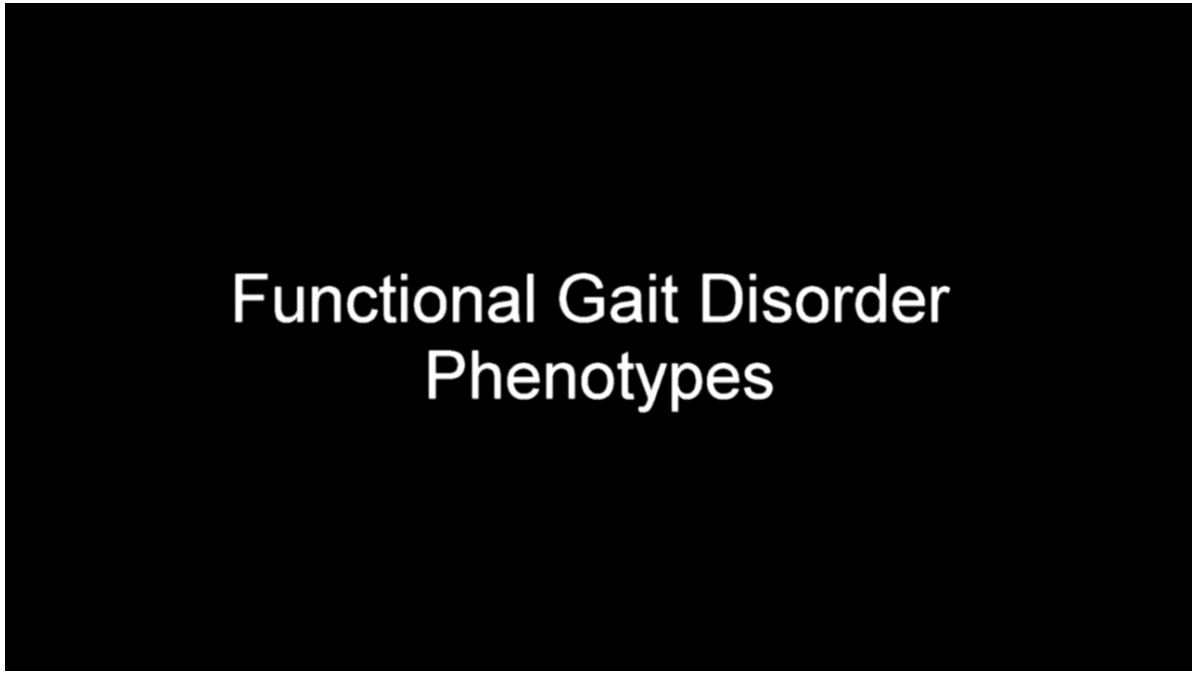
Park et al., 2015 MDCP

Functional Paroxysmal dyskinesia



- Variable phenomenology
- Distractibility
- Entrainment
- Significant variability in duration of episodes
- Late onset as compared to childhood onset

Functional Gait Disorders



- Bizarre gait
- Variability in gait
- Excessive slowness
- Dragging one leg behind the body
- Excessive lurching without loss of balance

Serranová et al., Neurol Clin 2023.

Swivel Chair Sign

Lagrand et al., MDCP 2024

Key Takeaways

- FMD is a rule-in diagnosis
- Look for positive signs (distractibility, entrainment, variability)
- Rate of misdiagnosis is very low when diagnosis is made with careful clinical exam.
- Timely diagnosis is important, as these are potentially treatable
- Unnecessary testing should be avoided
- Whenever in doubt, record a video for later review.

Thank you for listening!

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