Diagnosing tremor, abnormal movement and imbalance

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Types of involuntary movements

♦ Tremor
♦ Dystonia
♦ Chorea
♦ Myoclonus
♦ Tics
Tremor

- Rhythmic shaking of muscles that produces an oscillating movement
Parkinsonian tremor

- Rest tremor > posture > kinetic
- Re-emergent tremor with posture
- Usually asymmetric
- Pronation-supination tremor
- Distal joints involved primarily
- Often posturing of the limb
A woman with Parkinson disease exhibits a resting tremor while standing with her hand at her side. The tremor involves the distal joints and is characterized by wrist pronation-supination and has a slight pill-rolling quality at times.
Other parkinsonian features

- Bradykinesia
- Rigidity
- Postural instability
- Many, many other motor and non-motor features
Bradykinesia
Rigidity
Essential tremor

- Kinetic > postural > rest
  - Rest in 20%, late feature, only in arms

- Intentional 50%
  - Bringing spoon to mouth is challenging!!

- Mildly asymmetric

- Gait ataxia – typically mild

- Starts in the arms but can progress to neck, voice and jaw over time
  - Jaw tremor occurs with action, not rest
  - Neck tremor should resolve when patient is lying flat
Essential tremor
Many other tremor types

- Physiologic tremor
  - Like ET but faster rate and lower amplitude

- Drug-induced tremor –
  - Lithium, depakote, stimulants, prednisone, beta agonists, amiodarone
  - Anti-emetics (phenergan, prochlorperazine), anti-psychotics (except clozapine and Nuplazid)
Many other tremor types

- Primary writing tremor
  - only occurs with writing
- Orthostatic tremor
  - leg tremor with standing, improves with walking and sitting, causes imbalance
Many other tremor types

- Cerebellar tremor
- Slowed action/intention tremor
- Holmes tremor
- Mid-brain lesion, unilateral
Dystonia
Dystonia

- Muscle contractions that cause sustained or intermittent torsion of a body part in a repetitive motion
- Dystonia can be associated with tremor
  - Irregular, not rhythmic or oscillatory (rotational around a central plane)
- Head tremor is present in supine position
Take Away Point

- Dystonic neck tremor can sometimes be present without any observable torsion or posturing
- Neck tremor with minimal arm tremor is likely dystonic
Chorea

- Irregular abrupt movements that produce a dance-like presentation
Chorea
Myoclonus

- Brief jerk that occurs once or multiple times in a row
Myoclonus
Tics

- Repeated movements or sounds that are associated with an urge to produce the movement and can be suppressed
Tics
Psychogenic tremor

♦ Abrupt onset, variable pattern, distractible, suggestible, entrainable
Psychogenic tremor
Name the disorder - Case 1

- CC: bilateral hand tremor
- 62 year old man
- Onset of tremor 2 years ago
- Difficulty eating, drinking and writing
- h/o lumbar radiculopathy, HTN
- Meds: GBP, HCTZ, metoprolol
- FHx of tremor (father)
Case 1
Case 1 – Is it . . .?

A. Chorea
B. Dystonia
C. Essential tremor
D. Myoclonus
E. Parkinson’s
Name the Disorder - Case 2

- CC: left hand tremor
- 67 yo RH man
- Onset of tremor 7 years ago, mild imbalance, mild hand slowness
- FHX: cardiac disease
- h/o DM, HTN
- Meds: propranolol, lovastatin, glipizide
Case 2
Case 2 – Is it . . . ?

A. Chorea
B. Dystonia
C. Essential tremor
D. Myoclonus
E. Parkinson’s
Name the disorder - Case 3

- CC: head tremor
- 76 yo woman
- Head tremor x 10 years, no hand tremor, no improvement with primidone
- Meds: Sybicort inhaler
- h/o COPD
- FHx: HTN, DM
Case 3
Case 3 – Is it . . . ?

A. Chorea
B. Dystonia
C. Essential tremor
D. Myoclonus
E. Parkinson’s
Name the disorder - Case 4

- CC: involuntary body movement
- 94 yo woman
- Onset 5 years ago. Symptoms occur in clusters for minutes to hours. Sometimes unilateral limb, sometimes entire body. Better with Valium
- Meds: tylenol 3, Norco, Effexor
- PMHx: Arthritis and breast ca
Case 4
Case 4 – Is it . . .?

A. Chorea
B. Dystonia
C. Essential tremor
D. Myoclonus
E. Parkinson’s
Case 5

CC: gait dysfunction

77 yo man

Involuntary head movements, slowed arms and legs, shuffling gait and cognitive decline x 2 years

Meds: ASA, metoprolol

h/o CAD, aortic valve replacement

FHx: Parkinson’s mother and MGM
Case 5
Case 5 – Is it . . .?

A. Chorea
B. Dystonia
C. Essential tremor
D. Myoclonus
E. Parkinson’s
Notes for PCP

♦ Q: when should I refer to movement disorders?
  ♦ You suspect Parkinson’s
  ♦ Essential tremor is poorly controlled with first line medications
  ♦ Abnormal movement with other associated features like imbalance or cognitive impairment

♦ Q: Should I order any imaging?
  ♦ No. Most of the time imaging is not needed. Sometimes I need to order unusual images that PCP would not have ability to order (e.g. DaTscan)
Things to think about

♦ If the patient looks like they have Parkinson’s, please review medication list for antipsychotics and anti-emetics

♦ If the patient looks like they have essential tremor, please review medication list for tremor inducing agents like valproic acid, lithium and amiodarone.

♦ Likely my first recommendation is to reduce or wean off these medications before attempting medications for PD or ET
Most common gait disorders in my clinic

- Parkinson’s
- Normal pressure hydrocephalus
- Ataxia – central or peripheral/sensory
- Lumbar stenosis
- Cervical lesions
- Orthopedic conditions
Parkinson’s disease gait

- Amplitude reduction
  - Small step length and height, slowed gait
- Reduction in arm swing
- Freezing of gait – difficulty initiating gait
- En bloc turns
- Kyphosis
Parkinson’s disease gait
Lower body Parkinsonian gaits

- No parkinsonism in upper body, only lower body
- Higher-level gait disorder
- Vascular parkinsonism
- Normal pressure hydrocephalus
Higher-level gait disorder

- Associated with frontal lobe dysfunction
  - Frontotemporal dementia
  - Alzheimer’s disease
Vascular parkinsonism

- Associated with strokes involving the basal ganglia or diffuse white matter disease changes
- External rotation of legs and wider base
Vascular Parkinsonism
Normal pressure hydrocephalus

- Gait impairment
- Urinary incontinence
- Cognitive impairment

Assessment:
- MRI brain or CT head:
  - Ventriculomegaly
- MRI CSF flow, large volume LP
Normal pressure hydrocephalus

Ventriculoperitoneal Shunt Placement for Normal Pressure Hydrocephalus

Evan’s ratio > 31%
Frontal horn/Int skull

Callosal angle < 100 degree
Angle lat vent at post commis
Ataxia

♦ Physical finding, not a disease

♦ Impaired coordination of voluntary muscle movement

♦ Causes:
  ♦ Cerebellar disorder (genetic or acquired)
  ♦ Impaired vestibular input
  ♦ Impaired proprioceptive input (dorsal column, sensory nerves)
Features associated with ataxia

- Wide stance, Unstable gait
- Dysdiadokinesia
  - impairment of rapidly alternating movements
- Intention tremor
  - Increased amplitude of oscillation when trying to hit target
- Dysmetria
  - Miss target due to overshoot
Features associated with ataxia

- Cerebellar features:
  - Dysarthric speech
  - Nystagmus
  - Ocular dysmetria
    - Saccades over or undershoot target

- Sensory and vestibular ataxia features:
  - Balance worse in the dark
  - Positive Romberg
Ataxic gait
Spastic gait/hemiparetic gait

- Due to lesion of the corticospinal tract
  - Lesions in brain, brainstem or spinal cord
- Bilateral – scissoring gait
- Unilateral – hemiparetic gait

- Associated features:
  - Leg extension and foot plantarflexion
  - Hip circumduction
  - Spasticity – rate dependent increased tone
  - Hyperreflexia, clonus, Babinski
Hemiparetic gait
Scissoring gait
Other gait types

- Psychogenic
- Antalgic – pain
- Trendelenburg gait
  - gluteal muscle weakness
  - Hip instability
- Waddling – proximal weakness
**Name that gait - Case 1**

- CC: imbalance
- 65 yo woman with history of fall 4 years ago with possible head trauma and rhabdomyolysis. Continued unstable gait and diplopia since then.
- PMHx/Meds/SHx/FHx – not pertinent
Name that gait - Case 1
Case 1 – Is it?

A. Ataxia
B. Parkinsonian gait
C. Psychogenic gait
D. Spastic gait
Name that gait – Case 2

- CC: unstable gait and neck forward flexion
- 82 yo woman with onset of imbalance and neck starting 2 years ago
- PMHx: breast cancer
- Meds/FHx/SHx: not pertinent
Name that gait – Case 2
Case 2 – Is it?

A. Ataxia
B. Parkinsonian gait
C. Psychogenic gait
D. Spastic gait
Name that gait – Case 3

cc: progressive unstable gait, urinary incontinence and cognitive impairment
Case 3 – Is it?

A. Ataxia
B. Parkinsonian gait
C. Psychogenic gait
D. Spastic gait
Take Away Points

♦ Q: Which patients with unusual gaits should I send to movement disorder neurologists?

♦ A: All of them – unless you are fairly certain that the patient has an orthopedic cause for symptoms

♦ Q: Do I need to get imaging on patients with parkinsonian gaits?

♦ A: No. I can usually tell if someone has idiopathic (typical) PD without imaging. If there is a question, I will order imaging myself
Any questions?