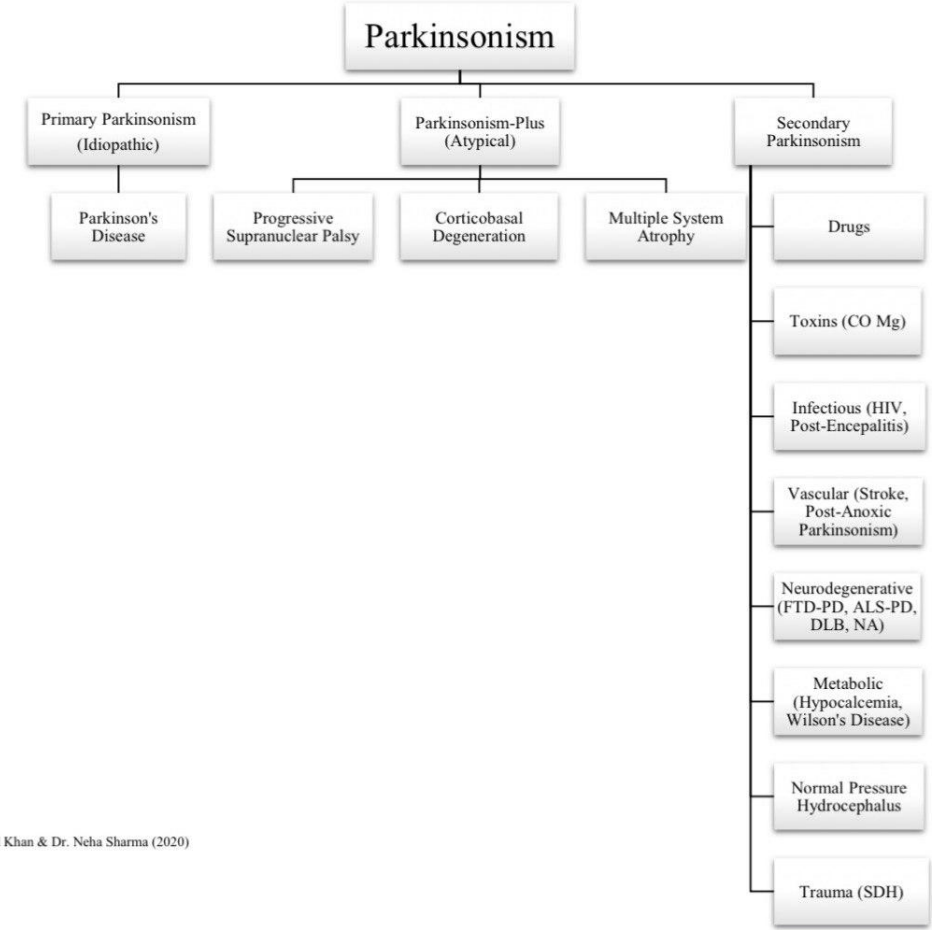
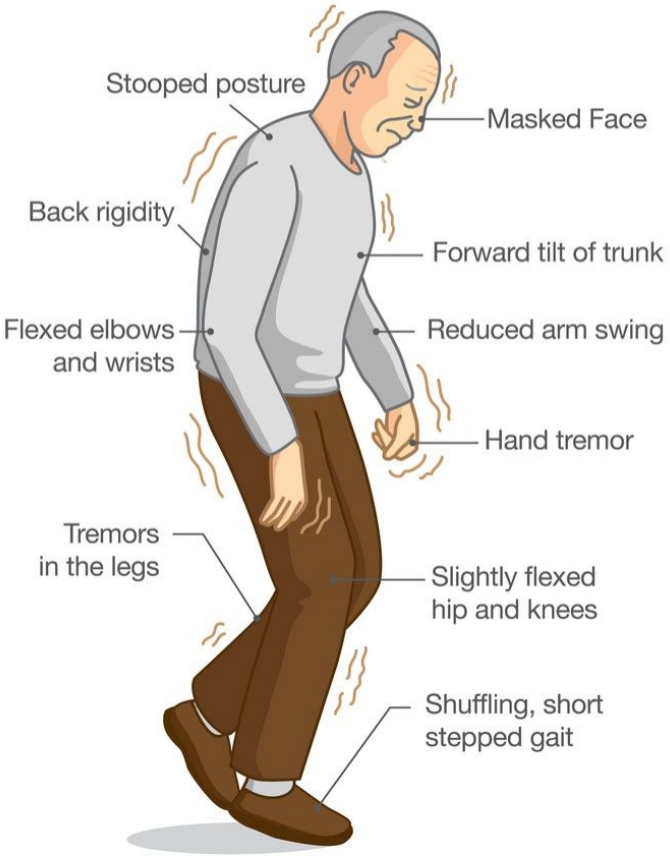
Parkinsonian-Plus Syndromes

Ruaa Alsaeed, MBBS
Alfaisal University



By: Dr. M. Faisal Khan & Dr. Neha Sharma (2020)

Parkinson's Disease Symptoms



Parkinson Disease

A chronic progressive neurodegenerative disorder

Bradykinesia, rigidity and rest tremor. Postural instability is a late sign

PD is a clinical diagnosis. No confirmatory physiologic or blood test.

Imaging is usually unremarkable

Established Parkinson Disease	Probable Parkinson Disease
Presence of Parkinsonism No absolute exclusion criteria Presence of two or more supportive criteria No red flags	Presence of Parkinsonism No absolute exclusion criteria The presence of red flags must be counterbalanced by supportive criteria

A- Parkinsonism

- It is an essential feature of PD defined by the following: **Bradykinesia** + Rest tremor **OR** Rigidity

B- Exclusion criteria:

- Cerebellar abnormalities or supranuclear gaze palsy
- Diagnosis of behavioral variant of FTD or primary progressive aphasia within 5 years of onset of the disease
- Parkinsonian features restricted to the lower limbs for more than 3 years
- Treatment with Dopamine depleting agents (antipsychotics, antiemetics)
- Absence of response to high-dose levodopa
- Cortical sensory loss, clear limb ideomotor apraxia, or progressive aphasia
- Normal functional imaging of the dopaminergic system (“DAT scan”)
- Diagnosis of alternative condition causing parkinsonism which could be causing the symptoms

C- Supportive Criteria:

- Responsive to dopaminergic drugs
- Levodopa-induced dyskinesia
- Unilateral rest tremor that is documented on examination
- Olfactory loss
- cardiac sympathetic denervation on metaiodobenzylguanidine scintigraphy

D- Red Flags:

- Rapid progression of gait impairment leading to wheelchair use within 5 years
- Absence of progression of motor symptoms over 5 years, unless related to treatment
- Early bulbar dysfunction
- Inspiratory respiratory dysfunction
- Severe autonomic failure within the first 5 years of disease
- Recurrent falls because of impaired balance within 3 years of onset
- Disproportionate anterocollis or contractures within 10 years of disease onset
- Absence of any of the common non-motor features despite 5 years of disease
- Unexplained pyramidal signs
- Bilateral symmetrical parkinsonism

What are the Parkinson-plus syndromes?

- A group of neurodegenerative diseases that present with Parkinsonism and additional clinical features
- Basal ganglia, cerebral cortical, cerebellar, brainstem structures could be affected
- Less favorable prognosis than PD
- Do not respond to levodopa treatment

Lewy Body Dementia

Both cognitive and motor symptoms emerge within 1 year of diagnosis

If dementia occurs >1 year after the onset of parkinsonism, then it is 2ndry to PD

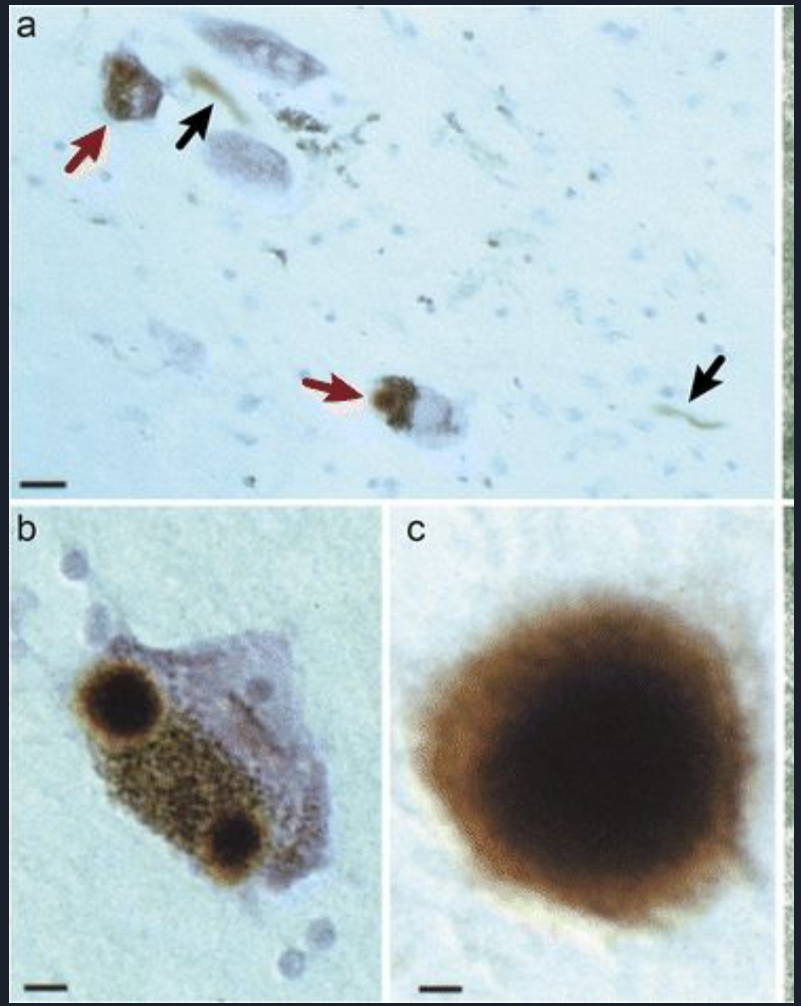
Core clinical features:

1. Fluctuating alertness and cognition
2. Visual Hallucinations
3. Parkinsonism
4. REM sleep behavior disorder

MRI: atrophy of substantia innominata and mesopontine grey matter

Skin biopsy: Deposits of alphasynuclein (a-syn), the protein that misfolds to become Lewy bodies

Post-mortem biopsy: alpha synuclein positive cytoplasmic inclusions (Lewy bodies)


a
b
c

Lewy Body Dementia

Treatment is symptomatic

Parkinsonian symptoms are treated similarly to PD

Dementia treatment is analogous to that of major neurocognitive disorders

Psychotic symptoms are treated by low-potency 2nd generation antipsychotics (limited use due to sensitivity to neuroleptics in LBD)

Multiple System Atrophy

Adult-onset neurodegenerative disorder of unknown etiology

Less responsive to L-Dopa than PD and faster in progression

Two main subtypes:

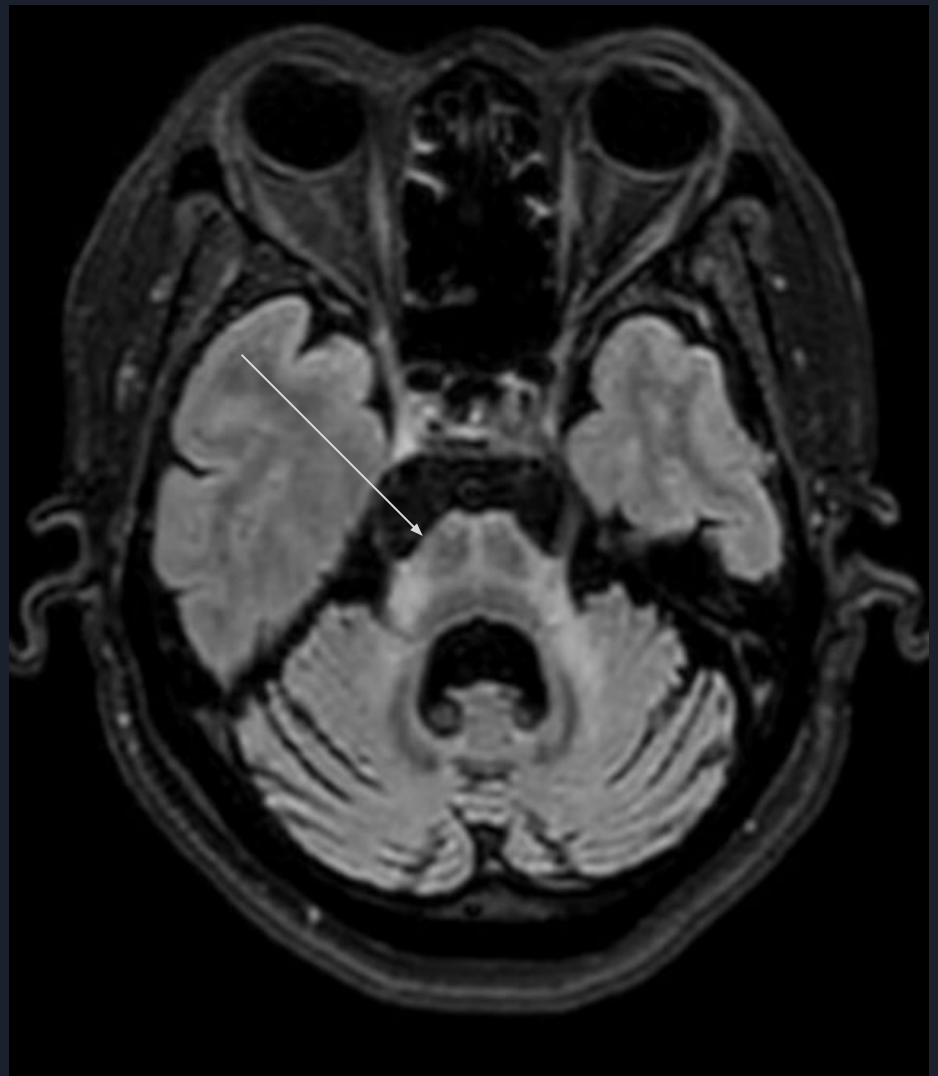
1. MSA-P: predominantly parkinsonian symptoms
2. MSA-C: predominantly cerebellar symptoms

Autonomic dysfunction is a hallmark of MSA (orthostatic hypotension, erectile dysfunction, incontinence)

Other symptoms include pyramidal, ocular and neuropsychiatric symptoms

MRI shows Hot Cross Bun Sign

Treatment is symptomatic



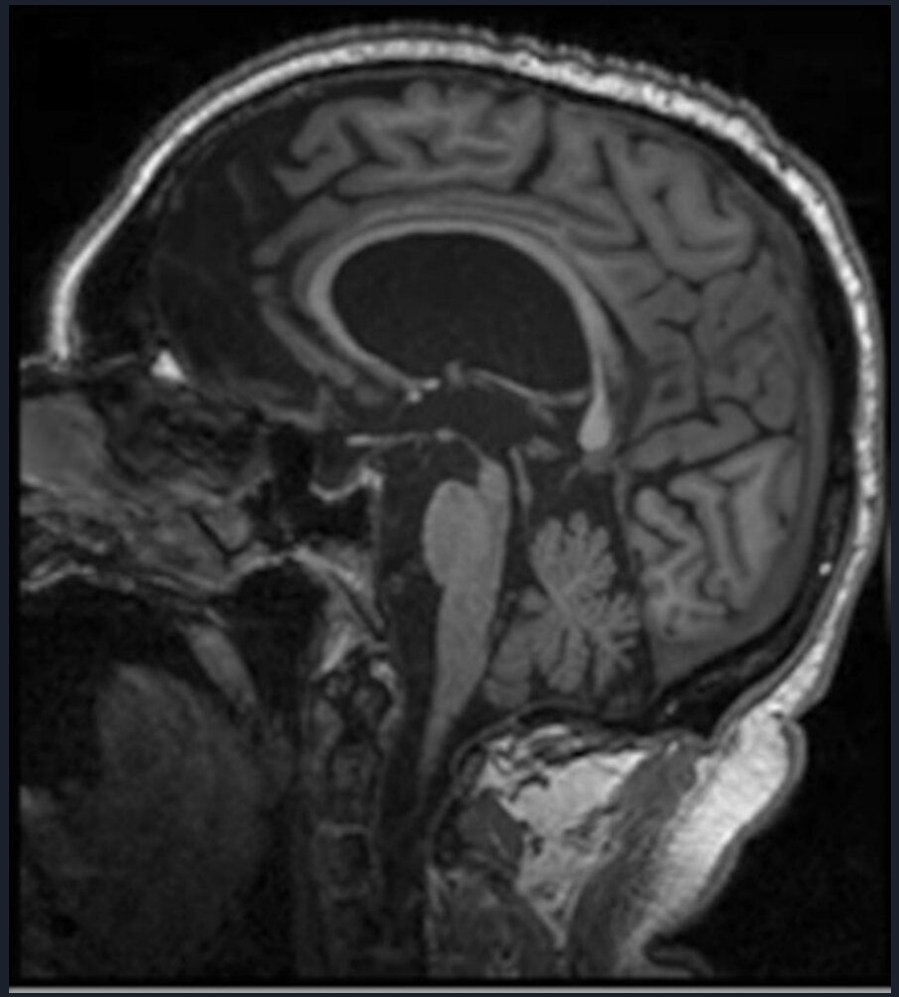
Progressive Supranuclear Palsy

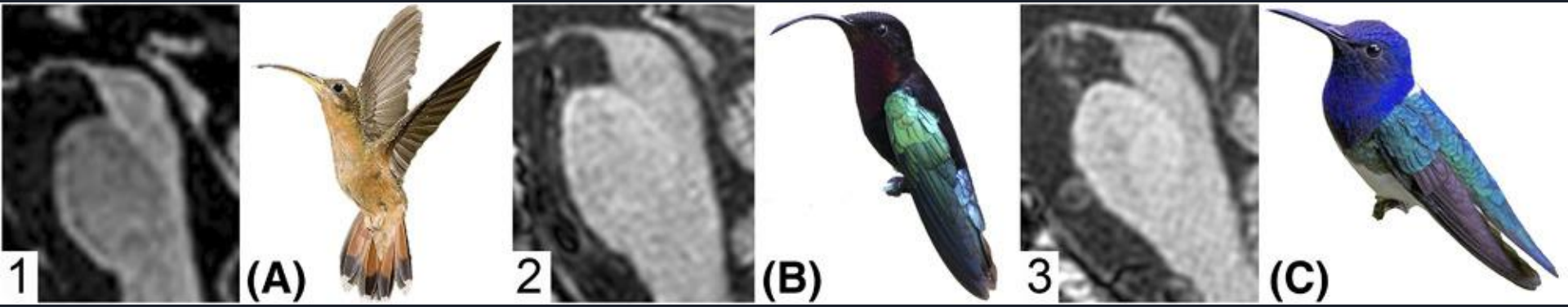
Atrophy of structures of midbrain-diencephalic junction

Clinical features include **vertical gaze palsy, postural instability**, frontal lobe abnormalities, bradykinesia, dysarthria and dementia

Unlike in PD, postural instability is an early sign (frequently the first sign)

MRI shows hummingbird sign (atrophy of the midbrain with intact pons)




1
(A)
2
(B)
3
(C)

Corticobasal degeneration

Very rare (1:100,000)

Characterized by asymmetric motor abnormalities, often affecting one limb (akinesia and extreme rigidity, dystonia, focal myoclonus, ideomotor apraxia, and alien limb phenomenon)

Alien limb phenomenon: the patient perceives the limb as not belonging to them

Dementia emerge early in the disease (may be the presenting feature) followed by parkinsonism

MRI shows asymmetric cortical atrophy and bilateral atrophy of the basal ganglia

Differential diagnoses of Parkinson-plus syndromes

	Clinical features	MRI
Multiple system atrophy (MSA)	• Motor abnormalities • Autonomic dysfunction • Cerebellar symptoms	• Hot cross bun sign
Progressive supranuclear palsy (PSP)	• Vertical gaze palsy • Postural instability → frequent falls • Frontal lobe abnormalities	• Hummingbird sign
Corticobasal degeneration (CBD)	• Alien limb phenomenon • Asymmetric motor abnormalities	• Asymmetric focal cortical atrophy • Bilateral atrophy of the basal ganglia
Dementia with Lewy bodies (DLB)	• Dementia • Parkinsonism • Visual hallucinations	• Atrophy of substantia innominata and mesopontine grey matter

Resources

- Amboss
- UpToDate