Parkinson Disease (Parkin-type)

Genetics  
-PRKN (formerly PARK2; parkin, only gene to cause parkin type of early-onset Parkinson)

-AR

Clinical findings/Dysmorphic features

-Early onset (age <40 years) or, rarely, juvenile onset (age <20 years)

-Lower-limb dystonia (muscles contract uncontrollably); hyperreflexia of lower extremities; well-preserved sense of smell; marked and sustained response to oral administration of levodopa; slow disease progression; absence of dementia in most cases (prevalence <3%)

Etiology

-In Europe: parkin type of early-onset Parkinson disease accounts for ~50% of AR parkinsonism

Pathogenesis

-Parkin is E3 ubiquitin ligase --> ubiquitination of proteins --> proteasomal degradation

-Parkin also mediates non-degradative modes of ubiquitination --> required for survival of nigrostriatal dopaminergic neurons

Genetic testing/diagnosis

-Detection frequency is 80%-90% in familial cases with onset before age 20 years; lower than 10% in individuals with no family history and onset around age 40 years