# Ataxia and Gait disturbance



Papitchaya Pichedboonkiat, MD.



#### Overview

- Definition
- Pathophysiology
- Ataxia
- Gait disturbance
- History and Physical examination
- Special conditions

#### Definition

- Ataxia : uncoordinated movement
- Gait disorder: abnormal pattern or style of walking

### Pathophysiology

- cerebellar lesions
- systemic or focal conditions that affect different elements of the central and peripheral nervous systems

#### TABLE 169-1 Common Etiologies of Acute Ataxia and Gait Disturbances Systemic conditions Intoxications with diminished alertness Ethanol Sedative-hypnotics Intoxications with relatively preserved alertness (diminished alertness at higher levels) Phenytoin Carbamazepine Valproic acid Heavy metals—lead, organic mercurials Other metabolic disorders Hyponatremia Inborn errors of metabolism Wernicke's disease Disorders predominantly of the nervous system Conditions affecting predominantly one region of the CNS Cerebellum Hemorrhage Infarction Degenerative changes Abscess Cortex Frontal tumor, hemorrhage, or trauma Hydrocephalus Subcortical Thalamic infarction or hemorrhage Parkinson's disease Normal pressure hydrocephalus Spinal cord Cervical spondylosis and other causes of spinal cord compression Posterior column disorders Conditions affecting predominantly the peripheral nervous system Peripheral neuropathy Vestibulopathy

#### Ataxia

- Motor ataxia
- Sensory ataxia

#### Motor ataxia

- Cerebellar ataxia
- cerebellar disorders
  - Integration of proprioception is faulty
  - Intact sensory receptors and afferent pathways
- Lateral cerebellar lesions: ipsilateral limb ataxia
- Midline cerebellar lesions: truncal ataxia

#### Motor ataxia

- Posterior limb of the internal capsule : isolated hemiataxia
- Thalamic nuclei : contralateral ataxia with sensory loss
- Frontal lobe (tumor or cystic masses): motor ataxia (contralateral)
- Nontraumatic spinal cord compression : gait ataxia



#### Sensory Ataxia

- failure of transmission of proprioception or position sensation to CNS
- May be due to disorders of spinal cord or peripheral nerves
- Can be compensated for by visual inputs

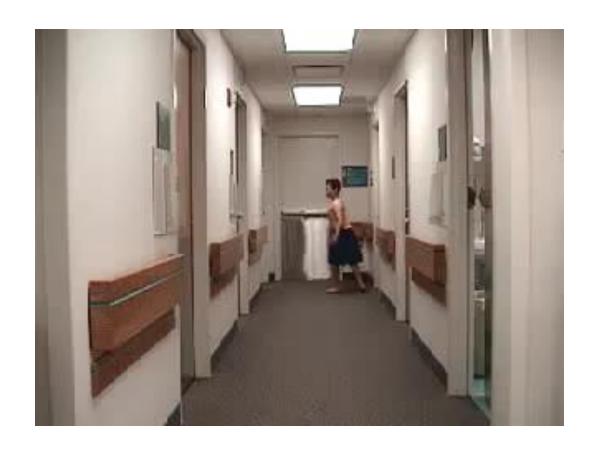


#### Gait Disorder

- Motor ataxic gait
- Sensory ataxic gait
- Apraxic gait
- Festinating gait (hypokinetic gait)
- Hemiplegic gait
- Waddling gait

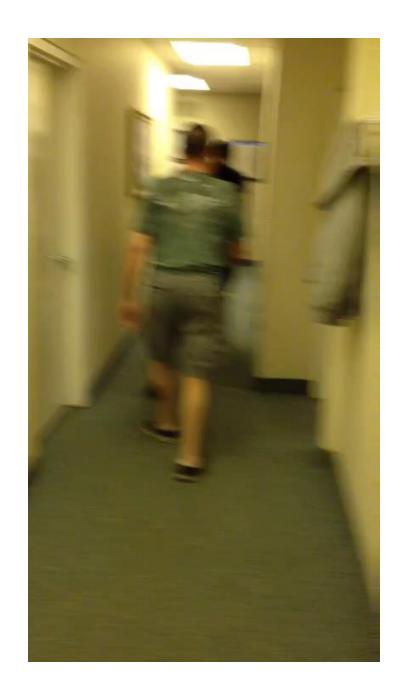
#### Motor ataxic gait

- Widely based with unsteady and irregular steps
- CNS lesions, ethanol intoxication



### Sensory ataxic gait

- Loss of proprioception
- Abrupt movement of the legs and slapping impact of the feet with each step



#### Apraxic gait

Lost the ability to initiate the process of walking

Ignition failure

Right or nondominant hemispheric lesions and frontal lobe

dysfunction



### Festinating gait

- Narrowly based miniature shuffling steps
- Parkinson's disease



### Hemiplegic gait

Asymmetric weakness of the proximal lower extremity muscles



### Waddling gait

 failure to maintain the normal position of the pelvis relative to the lower extremities



#### History

- Onset
- Previous symptoms
- Medications
- Alcohol intake/drug use

#### **Associated Symptoms**

- Headache
- Drowsiness
- Dizziness
- Vertigo
- Tinnitus
- Fever
- Nausea/vomiting
- Weakness
- Paresthesia

### Physical Examination

- Vital sign : orthostatic hypotension
- Neurologic exam
  - Cranial nerve, mental status, sensation, motor, nystagmus
  - Gait
  - Cerebellar sign
    - Dysdiadochokinesia
    - Finger-to-nose test
    - Heel-to-shin test
    - Rhomberg

### Diagnosis

- Sensory or Motor ataxia
- Systemic or Nervous system
- Localization
- CT, MRI,LP

#### Special Populations

- Geriatric Patient
  - Gait normally changes with age
  - Shortened stride, Widened base, Slow gait
- Senile gait may represent neuronal loss, reduced proprioception, slowing of corrective responses and weakness

#### Special Populations

- Alcoholic Patient
  - associated with confusion and eye movement abnormalities
  - Wernicke encephalopathy needs to be considered
  - Still other intracranial pathology needs to be ruled out
  - Treatment: IV hydration, Vit B1 and dextrose

## **Special Populations**

- Children
  - May appear well, but wobbly when sitting
  - Intoxications are most common, followed by infection/inflammation

TABLE 169-3 Causes of Acute Ataxia in Children, Roughly in Order of Frequency	
Cause	Example
Drug intoxication	Ethanol
	Isopropyl alcohol
	Phenytoin
	Carbamazepine
	Sedatives
	Lead, mercury
ldiopathic	Acute cerebellar ataxia of childhood
Infection and inflammation	Varicella
	Coxsackievirus A and B
	Mycoplasma
	Echovirus
	Postinfectious inflammation
	Postimmunization
Neoplasm	Neuroblastoma
	Other CNS tumors
Paraneoplastic	Opsocionus-myocionus syndrome
Trauma	Subdural or epidural posterior fossa hematoma
Congenital or hereditary	Pyruvate decarboxylase deficiency
	Friedreich's ataxia
	Hartnup disease
Hydrocephalus	
Cerebellar abscess	
Labyrinthitis/vestibular neuronitis	
Transverse myelitis	
Meningoencephalitis	