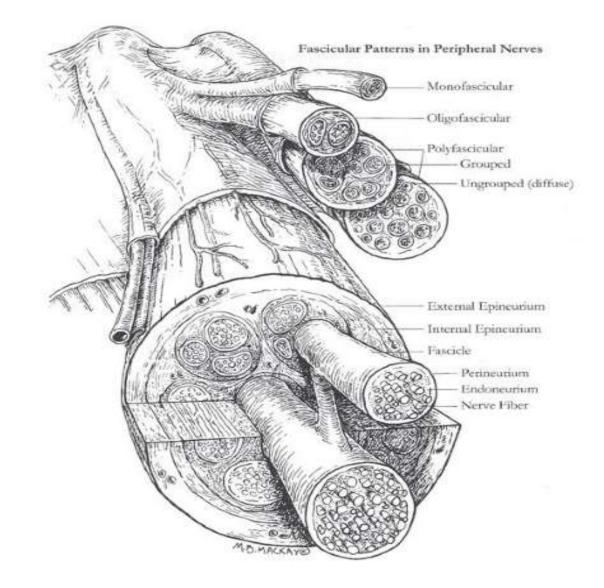
Neuroscience II Peripheral Neuropathy

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Anatomy of Peripheral nerves



Types of nerve injury

- Class I: Neuropraxia
- Class II: Axonotmesis
- Class III: Neurotmesis

Neuropraxia

- Functional deficit in a segment of the nerve where:
- 1. The continuity of the nerve is intact
- 2. The perineureum, endoneureum, and epineureum are intact
- 3. The distal and proximal segments are intact
- 4. There is usually full recovery
- 5. No degeneration of the nerve
- 6. There is usually motor and sensory symptoms

Axonotmesis

- Injury to the axon and endoneureum
- Degeneration of the segment distal to the injury (Wallerian degeneration several days after the injury)
- No conduction distal to the segment
- Recovery can occur by axonal regeneration but it takes longer duration
- Functional deficit occurs as a result but recovery is possible

Neurotmesis

- There is lesion of the axons, endoneureum, perineurem, and epineureum
- Wallerian degeneration within several days
- No spontaneous recovery is possible without surgical repair
- Functional motor and sensory deficits result from this type of injury

Classification of neuropathy

- Plexopathy: such as brachial plexus lesion
- Mononeuropathy: such as median neuropathy, anterior interosseus syndrome, Ulnar nerve compression, Radial nerve compression, Posterior interosseus syndrome, Femoral nerve syndrome, Lateral cutaneus nerve syndrom (meralgia parasthetica), Common peroneal nerve syndrome.
- Polyneuropathies: it is a systemic neuropathy that affects almost all nerves in a variable degree. It is usually length dependent where the longest axons are affected earlier. It can be classified into hereditary or acquired polyneuropathy

Hereditary Polyneuropathies

- CMT: Charcot-Marie-tooth syndrome
- Friedreich ataxia
- Giant axonal neuropathy

Acquired polyneuropathies

- Neuropathies associated with endocrine disorders: diabetes and thyroid diseases
- Neuropathies associated with systemic disease Connective tissue disease (rheumatoid arthritis, lupus, Sjögren syndrome) (see pg. 315) Inflammatory bowel disease (ulcerative colitis, Crohn disease) Liver disease Renal failure (uremic neuropathy)
- Neuropathy related to nutritional deficiency Vitamin deficiency (B12, B6, E), Copper

Acquired polyneuropathies

- Toxic neuropathies: Medications (metronidazole, colchicine, disulfiram, cisplatin, vinca alkaloids, many others) Heavy metals (lead, mercury, arsenic)
- Neuropathy associated with infections Viral (HIV, HTLV-1, VZV, hepatitis B and C), Bacterial (Lyme, leprosy)
- Acute inflammatory: Guillain-Barré Syndrome (GBS)
- Chronic Acquired Immune-Mediated Demyelinating Polyneuropathies

GBS Variants

- Acute inflammatory demyelinating polyneuropathy (AIDP): 90% of cases
- Acute motor axonal neuropathy
- Acute motor-sensory axonal neuropathy (AMSAN)
- Miller-Fisher syndrome:
- Acute panautonomic neuropathy

Chronic Acquired Immune-Mediated Demyelinating Polyneuropathies

- Chronic inflammatory demyelinating polyneuropathy (CIDP)
- Multifocal acquired demyelinating sensory and motor neuropathy (MADSAM)/ Lewis-Sumner syndrome
- Distal acquired demyelinating sensory neuropathy.
- Multifocal motor neuropathy

Symptoms of polyneuropathy

- Motor symptoms (somatic or autonomic)
- Sensory neuropathy (somatic or special senses)

Motor somatic Symptoms

- Weakness
- flaccidity
- Atrophy of muscles
- Hyporeflexia or a reflexia
- Fasciculations

Motor autonomic symptoms

- Orthostatic hypotension in the form of dizziness
- Tachycardia or bradycardia
- Gastroparesis (feeling of fullness)
- Urine incontinence
- Fecal incontinence
- Impotence
- Blurred vision
- Dryness of skin (anhydrosis with reduced sympathetic flow)
- Excessive sweating (with increased sympathetic flow)

Somatic sensory symptoms

- Focal sensory loss (mononeuropathies) and gloves and stocking distribution of sensory loss in case of polyneuropathy)
- Parasthesia, dysesthesia, allodynia, hypersthesia, burning sensations, electric shooting pain
- Ataxia due to decreased position sense

Special sense neuropathy

- Loss of smell due to involvement of the olfactory nerve: anosmia
- Blurring of vision (optic neuritis). This is central nervous system nerve
- Loss of taste that is usually seen with facial nerve palsy
- Vertigo with vestibular neuritis

Neuralgias

- Irritation of the nerve results in ephabtic transmission and spontaneous firing
- Usually idiopathic but can result from irritation of the nerve or toxic, metabolic causes.
- Examples:
- 1. Trigeminal neuralgia
- 2. Occipital neuralgia
- 3. Glossopharyngeal neuralgia