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Note on Peripheral Nerve Injury Classification

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Perspective

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DESCRIPTION

The classification of peripheral nerve injury aids in prognosis and treatment approach selection. Seddon defined nerve damage classification in 1943, and Sunderland defined it in 1951. Neurapraxia is the lowest level of nerve injury, in which the nerve remains intact but the signalling ability is impaired. Axonotmesis is the second degree of damage, in which the axon is injured but the surrounding connective tissue is unaffected. Neurotmesis is the last stage of the disease, when both the axon and the connective tissue are destroyed.

The Peripheral Nervous System (PNS) is one of two components that make up a bilateral animal's nervous system, with the Central Nervous System (CNS) being the other (CNS). The PNS is a relay system that connects the brain and spinal cord to the rest of the body, connecting the CNS to the limbs and organs. The PNS, unlike the CNS, is neither covered by the vertebral column and skull, nor is it protected by the blood–brain barrier, leaving it vulnerable to poisons and mechanical trauma.

There are two sections to the nervous system: the somatic nervous system and the autonomic nervous system. The cranial nerves, with the exception of the optic nerve (cranial nerve II) and the retina, are part of the PNS in the somatic nervous system. The second cranial nerve is a diencephalon tract, not a real peripheral nerve. The cranial

nerve ganglia arose from the CNS. The remaining ten cranial nerve axons, on the other hand, reach beyond the brain and are thus classified as part of the PNS. Smooth muscle and glands are controlled involuntarily by the autonomic nervous system. The system can be in two different functioning states thanks to the connection between the CNS and the organs: sympathetic and parasympathetic.

It's a transient break in conduction that doesn't affect axonal continuity. There is a physiologic obstruction of nerve transmission in the damaged axons in neurapraxia.

Additional attributes

- It's the most common type of peripheral nerve damage.
- Distal to the injury site, there are sensory-motor issues.
- The endoneurium, perineurium, and epineurium are all in good condition.
- There is no such thing as wallerian degeneration.
- Conduction is intact in the distal and proximal segments; however there is no conduction across the injured area.
- Nerve conduction deficit recovery is complete and takes days to weeks.
- EMG reveals the absence of Fibrillation Potentials (FP) and the presence of positive sharp waves.
- It involves the axon's relative continuity and myelin sheath being lost, while the nerve's connective tissue framework being intact (the encapsulating tissue, the epineurium and perineurium, are preserved).

Other characteristics

- Distal to the damage site, Wallerian degeneration ensues.
- There is a partial or total connective tissue lesion.
- Sensory-motor difficulties and autonomic dysfunction are significant.
- Distal to the damage site, there is no nerve conduction (3 to 4 days after lesion).
- The findings of EMG and NCV are axonotmesis.
- Surgical intervention is required due to a lack of nerve.
- A nerve fibre disruption is Sunderland's third-degree. The endoneurium is injured in third-degree damage, whereas the epineurium and perineurium are unaffected. It is possible to recover from a third-degree injury, but surgery may be required.