



양 지 원

가천대학교 길병원 신경과

Basic Anatomy of Spinal Cord and Peripheral Nervous System

Jiwon Yang, MD

Department of Neurology, Gachon University, Gil Medical Center

The spinal cord is the primary pathway of communication between brain and peripheral nervous system. There are 31 spinal cord segments, each with a pair of ventral (anterior) and dorsal (posterior) spinal nerve roots, which mediate motor and sensory function, respectively. The ventral and dorsal nerve roots combine on each side to form the spinal nerves as they exit from the vertebral column through the neuroforamina. The spinal cord is divided longitudinally into four regions: the cervical, thoracic, lumbar, and sacral cord. On the other hand, it can be divided cross-sectionally into three regions: gray matter, which contains the neuronal cell bodies and is made up of the dorsal and ventral horns, and the surrounding white matter tracts. Spinal cord also has autonomic fibers in the lateral aspect. Sympathetic fibers exit between T1 and L2, and parasympathetic fibers exit between S2 and S4.

The peripheral nervous system refers to parts of the nervous system outside the brain and spinal cord. It includes the 12 cranial nerves, 31 spinal nerves and their roots and branches, peripheral nerves, and neuromuscular junctions. Nerve fibers of the PNS are classified according to their involvement in motor or sensory, somatic or visceral pathways. The somatic sensory division carries signals from receptors in the skin, muscles, bones and joints. The visceral sensory division carries signals mainly from the viscera of the thoracic and abdominal cavities. The somatic motor division carries signal to the skeletal muscles. The visceral motor division, also known as the autonomic nervous system, carries signal to glands, cardiac muscle, and smooth muscle. It can be further divided into the sympathetic and parasympathetic divisions. Mixed nerves contain both motor and sensory fibers. A nerve is an organ composed of multiple nerve fibers bound together by sheaths of connective tissue. The sheath adjacent to the neurilemma is the endoneurium, which houses blood capillaries that feed nutrients and oxygen to the nerve. In large nerves, fibers are bundled into fascicles and wrapped in a fibrous perineurium. The entire nerve is covered with a fibrous epineurium.

Jiwon Yang

Department of Neurology, Gachon University, Gil Medical Center,

21 Namdong-daero 774beon-gil, Namdong-gu, Incheon, Korea

Tel: +82-32-460-3346 Fax: +82-32-460-3344

E-mail: dr.jiwon.yang@gmail.com