



Differential Diagnosis of Distal Sensory Polyneuropathy (DSP)

Disease	Notes
Disease of CNS (brain)	A variety of diseases of brain (e.g., strokes, tumors, infections, degenerative diseases, multiple sclerosis) can have sensory or motor symptoms or signs. The pattern of sensory and motor symptoms is not distal and symmetrical. Examination signs referable to cranial nerves, hemicorporal sensory loss, or upper motor neuron signs (hyperreflexia, spasticity, Babinski's sign, and clonus) distinguish from DSP. Neuroimaging studies, especially MRI scans of brain, are helpful in excluding CNS disease.
Disease of CNS (spinal cord)	A variety of diseases of spinal cord (e.g., herniated discs, spinal stenosis, tumors, infections, myelitis, degenerative diseases) can have sensory or motor symptoms or signs. The pattern of sensory and motor symptoms is rarely distal and symmetrical. Examination signs such as a distinct sensory level on the trunk below which sensation is lost, crossed sensory and motor findings, upper motor neuron signs (hyperreflexia, spasticity, Babinski's sign, and clonus), and bowel or bladder incontinence distinguish from DSP. Neuroimaging studies such as MRI scans of spine or CT myelography are helpful in excluding spinal cord disease. Cerebrospinal fluid analysis may also be helpful when looking for infectious, autoimmune, or neoplastic processes.
Polyradiculopathy	Involvement of multiple lumbosacral nerve roots by vasculitis, SLE, diabetes mellitus, inflammatory demyelination, infectious agents, or neoplasm (meningeal carcinomatosis, lymphoma) can cause pain, sensory loss, and weakness in the lower extremities. Symptoms occur in a polyradicular pattern in one or both lower extremities. The symptoms are usually asymmetric, and pain is often prominent. Sensory symptoms and weakness usually present early in the course of the illness. Neuroimaging studies, especially MRI scans of spine, and cerebrospinal fluid analysis can be helpful in this diagnosis. EMG is helpful for localization.
Lumbar disc herniation	In lumbar disc herniation, there is usually compression of a single nerve root (L5 > S1 > L4) with pain, numbness, and weakness in that radicular distribution. Symptoms and signs are strikingly asymmetric, and pain is within a radicular distribution. In contrast to DSP, the symptoms are usually acute. Neuroimaging studies, especially MRI scans of spine, are helpful in confirming the diagnosis. EMG is also helpful for localization.
Lumbar spinal stenosis	In lumbar spinal stenosis there is compression of multiple lumbosacral nerve roots caused by structural narrowing of the lumbar spinal canal. This is usually caused by degenerative lumbar spine disease. Usual symptoms are

pain and numbness in the lower extremities precipitated by standing and walking. Sitting and lying down relieve symptoms in contrast to DSP in which symptoms are present regardless of position. Neuroimaging studies, especially MRI scans of spine or CT myelography, are helpful in confirming the diagnosis. EMG is also helpful for localization.

Lumbosacral plexopathy

Involvement of lumbosacral plexus can occur by tumor infiltration, inflammatory processes, diabetes mellitus, vasculitis, or trauma. Usually present with pain, numbness, and weakness in one lower extremity. Although lumbosacral plexopathies may be confused with lumbosacral radiculopathies, the asymmetrical distribution of symptoms and signs distinguishes this condition from DSP. Neuroimaging of plexus with MRI scans is helpful with trauma and tumors. EMG is helpful for localization.

Mononeuropathy or mononeuropathy multiplex

Mononeuropathy is a focal lesion of a single peripheral nerve. The usual causes are trauma, focal compression, or entrapment. Mononeuropathy multiplex is involvement of multiple separate noncontiguous peripheral nerves. The most common cause of mononeuropathy multiplex is vasculitis, which is often associated with polyarteritis nodosa, Churg-Strauss syndrome, or one of the connective tissue diseases (SLE, rheumatoid arthritis, Sjögren syndrome) or diabetes mellitus. Other diseases such as sarcoidosis, lymphoma, carcinoma, leprosy, Lyme disease, HIV, amyloidosis, celiac disease, and cryoglobulinemia can also cause this syndrome. Because the deficits are restricted to one or a few major peripheral nerves, there usually is no problem distinguishing from DSP. In rare instances of mononeuropathy multiplex, the deficits might summate to produce confluent and symmetric deficits that mimic the pattern of DSP. Attention to the pattern of early symptoms is important in distinguishing a mononeuropathy multiplex from DSP. EMG is helpful for localization.

Tarsal tunnel syndrome

This is strictly a mononeuropathy affecting the tibial nerve within the tarsal tunnel. It is uncommon. The true syndrome characteristically causes pain in the ankle, foot, and paresthesias with numbness in the sole of the foot. External compression, trauma, or a host of other causes can compress or entrap the nerve. In contrast to DSP, the symptoms are almost always unilateral, and numbness is restricted to the sole of the foot. Ankle jerks should be preserved in tarsal tunnel syndrome. In the rare case of bilateral tarsal tunnel syndrome, EMG or NCS should differentiate from DSP. EMG is helpful for diagnosis. MRI scans of the ankle can be helpful in documenting several causes of tarsal tunnel syndrome

CNS = central nervous system; CT = computed tomography; DSP = distal symmetric polyneuropathy; EMG = electromyography; HIV = human immunodeficiency virus; MRI = magnetic resonance imaging; NCS = nerve conduction study; PAD = peripheral arterial disease; SLE = systemic lupus erythematosus.

Table from *Physicians Information and Education Resource (PIER), Peripheral Neuropathy* module.