

SPINAL CORD DISORDERS AND PERIPHERAL NEUROPATHY

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PERIPHERAL NEUROPATHY

- Peripheral nerves

 - Nerves arising from the pial membrane outside the brain and the spinal cord.
 - Examples:
 - Bell's palsy (Idiopathic lower motor facial nerve palsy)
 - Sparing frontalis → UMN lesion
 - Involving the frontalis → LMN lesion
 - Carpal tunnel syndrome (median nerve entrapment) → mono-neuropathy)
 - Exclude the optic and olfactory cranial nerves which are considered extensions of the brain.
- Damage can occur at the nerve root or in the course of the nerve.
 - Nerve root or the nerve
 - Myelin (demyelinating neuropathy) or the axon (axonal neuropathy)
- Most distal and longest nerves affected first and in a symmetrical manner therefore in a diabetic, for instance, the first complaint is a burning sensation in the feet.

CONT.

- Clinically can affect the motor, sensory or autonomic nerves:

 - **Sensory:** Pain, tingling, numbness in a 'stocking or glove' distribution
 - **Motor:** Weakness or loss of balance in later stages
 - **Autonomic:** Heart rate, digestion, bladder/bowel

- Isolated specific nerves:
 - **Median (carpal tunnel)**
 - Predisposition e.g. intra- or post-partum
 - Wakes up and shakes the arm and the patient get's relief.
 - **Lateral cutaneous nerve of the thigh (Meralgia paresthetica)**

SYNDROMES

1. Impaired motor function → polyneuropathies
2. Reduced tendon reflexes → esp. in large fiber neuropathies
 - **Ankle reflex is the first one to go**
3. Sensory loss or positive sensory symptoms
 - **Diabetes is a good example**
4. Sensory ataxias/tremor
 - **Miller-fischer variant of GBS; Tabes dorsalis, diabetic pseudotabes**
5. Deformities → hereditary polyneuropathies
 - **Charcot-Marie Tooth neuropathy type II**
 - **Pes cavus and very thin legs**
 - **Charcot joints**
6. Autonomic dysfunction → diabetes, amyloidosis, GBS
 - **GBS polyneuropathy**
7. Fasciculation, cramps, spasms → chronic spinal motor root compression (uncommon)

COMMON CAUSES OF PERIPHERAL NERVE DISORDERS

[DANG-THE-RAPIST]

- **D**iabetes
- **A**lcohol
- **N**utritional: B12, B6, folate
- **G**BS
- **T**rauma
- **H**ereditary: Charcot-Marie Tooth, Fabry's disease, Tangiers
- **E**nvironmental/toxins/drugs → Isoniazid, Metronidazole, Vincristine, Vinblastine, lead, arsenic, mercury
- **R**heumatic: RA
- **A**myloid
- **P**ara-neoplastic
- **I**nfections: HIV, VZV
- **S**ystemic diseases: Thyroid disease, renal, liver, lupus
- **T**umors

APPROACH TO A PATIENT WITH PERIPHERAL NEUROPATHY

1. Establish the existence of the peripheral neuropathy
 2. Clinically describe the topographical syndrome. Ask the patient to point where there is numbness.
 - **Polyneuropathy: symmetrical**
 - Most are small-fiber polyneuropathies where reflexes are preserved.
 - **Radiculopathy: nerve root**
 - **Mono-neuropathy**
 - **Multiple mono-neuropathies**
 - **Plexopathy**
- Diagnosis: thorough medical history and examination
 - Management: depends on the cause. Manage the cause as you manage the discomfort.

SPINAL CORD DISORDERS

ANATOMY

- Originates at the medulla and terminates at the filum terminale (L1)
- White matter → peripheral
- Gray matter → central

SPINAL CORD LEVELS RELATIVE TO VERTEBRAL BODIES

SPINAL CORD LEVEL	CORRESPONDING VERTEBRAL BODY
UPPER CERVICAL	SAME AS CORD LEVEL
LOWER CERVICAL	1 LEVEL HIGHER
UPPER THORACIC	2 LEVELS HIGHER
LOWER THORACIC	2-3 LEVELS HIGHER
LUMBAR	T10 – T12
SACRAL	T12 – L1
COCCYGEAL	L1

LONG TRACTS IN THE SPINAL CORD

TRACT	LOCATION	FUNCTION
GRACILE MEDIAL	DORSAL COLUMN	PROPRIOCEPTION FROM THE LEG
CUNEATE	LATERAL DORSAL COLUMN	PROPRIOCEPTION FROM THE ARM
SPINOCEREBELLAR	SUPERFICIAL LATERAL COLUMN	MUSCULAR POSITION AND TONE
PYRAMIDAL	DEEP LATERAL COLUMN	MOTOR CONTROL
LATERAL SPINOTHALAMIC	VENTROLATERAL COLUMN	PAIN AND THERMAL SENSATION

SOME TREATABLE CAUSES OF SPINAL CORD DISORDERS

- Compressive
 - Epidural, intra-dural or intramedullary neoplasm
 - Epidural abscess, hemorrhage
- Vascular
 - AVM
- Inflammatory
 - Transverse myelitis, MS
- Infections
 - HSV2, parasitic/bacterial
- Developmental
 - Syringomyelia
- Metabolic
 - Sub-acute combine degeneration

CLINICAL PRESENTATION

- Acute and sub-acute symptoms point to extra-medullary compression (tumor, infection, spondylosis or trauma) → Treatable
- Warning signs → pain, bladder disturbances or sensory symptoms
- No warning signs → infection, hemorrhage, sub-laxation

EXAMINATION

- ~~General observation: mood, abnormal posture, abnormal gait~~
- Conscious level/higher functions
- Cranial nerves: ocular involvement in demyelination
- Head/neck and spine: Gibbus, tenderness
- Motor: bulk, tone, power, reflexes, including plantar reflex
- Sensory: look for a level
- Coordination: upper cervical and cerebellar involvement in syringomyelia

EXAMINATION

TESTS OF SENSATION

Modality	Pathway
Temperature pain	Small fibers/ spino-thalamic
Light touch	Moderately myelinated/combined pathways
Vibration/proprioception	Large fibers/dorsal column
<ul style="list-style-type: none">• Stereogenesis• Graphaesthesia• Two point discrimination	Parietal cortex (only valid if peripheral sensation is intact)

DISTINGUISHING UPPER AND LOWER MOTOR NEURON SIGNS

○ UMN

- Normal bulk
- Spastic tone
 - Sustained myoclonus
- Pyramidal pattern of weakness
- Hyper-reflexia
- Absent abdominal reflexes
- Extensor plantar response

○ LMN

- Prominent wasting
- Reduced tone
- Fasciculations
- Weakness
- Reflexes may be absent or reduced (Hypo- or areflexia)

SPECIFIC LOCALIZING SIGNS

○ Cervical

- Quadriplegia
- Respiratory weakness (C3 – 5)
- Vasomotor and respiratory collapse
- Horner's syndrome

○ Thoracic

- Sensory level on the trunk
- Disturbance of bladder, bowel or sexual dysfunction
- Abdominal reflexes lost
- Mid-back pain

○ Lumbar

- Less easy to localize
- L2 – 4 weak hip flexion/adduction
- L5 – S1 weak foot and ankle movements
- Cremasteric reflex L1 – 2

○ Sacral cord/conus medullaris

- Sparing of motor and reflex movements in legs
- Saddle anesthesia S3 – S5
- Prominent bladder, bowel and sexual dysfunction
- Absent bulbo - cavernosus (S2 – S4) and anal reflexes (S4 – S5)

MANAGEMENT

- Early recognition and intervention improves outcome

- Depends on the cause:

- Reduce edema with steroids
- Treat infection
- Surgical decompression

- Medical rehabilitation: EARLY

- Respiratory compromise
- Bladder dysfunction
- VTE
- Bed sores
- Spasticity
- Hyper-reflexia

TYPED BY EFFIE NAILA.

PRAY WITHOUT CEASING.

EVEN WHEN ALL YOU HAVE LEFT IS A WHISPER.

- 1st THESS. 5: 17