

Lower Extremity Case – CAPM&R Review Course

A 60 year-old woman presents with an insidious onset of bilateral distal lower extremity/foot pain, numbness, and paresthesia over the last 20 months. She reports that when she walks it feels like she is “walking on marshmallows”.

1. What **specific** questions do you want to ask to narrow down your differential diagnosis? (ie. list pertinent positive and negative findings)

Pain history questions (SOCRATES):

Site? – diffuse bilateral distal feet and ankle

Onset? – Insidious

Character? - neuropathic descriptors (tingling, numbness, electrical shocks and burning sensation intermittently)

Radiation? – local/proximal radiation to distal one third of leg

Associated Symptoms? - recent onset of similar symptoms in bilateral hands, worse at night during sleep, frequent night awakening, imbalance, constitutional symptoms, weakness (ie. Foot drop).

Time duration? – 20 months

Exacerbating and alleviating factors? – no specific factors

Severity? - moderate (5-7/10)

Distribution of symptoms? - Distal vs proximal, symmetric vs asymmetric

Past Medical History:

- **Positive history** of Type 2 Diabetes Mellitus x 12 years (cannot remember last HbA1c level and does not check blood glucose levels at home) and Hyperlipidemia
- **Negative history** of thyroid disease, B12 deficiency (eats meat), liver disease, HIV risk factors, or cancer

Family History:

- Positive for Type 2 Diabetes Mellitus in mother

Medications:

- Metformin 500 mg bid
- Empagliflozin 12.5 mg bid
- Gliclazide 60 mg q breakfast
- Atorvastatin 10 mg qhs

Allergies: No known drug allergies

Social History:

- **Negative history** for smoking, alcohol, recreational drugs, heavy metal/lead

Case 2 – Answer Key

2. Based on this history, describe the physical examination you will perform and any specific things you are looking for.

Inspection:

skin trophic changes (autonomic) - shiny swollen skin or dry skin, brittle nails, absence of hair in distal one third of leg
ulcers – none
muscle mass asymmetry and fasciculations – none

Palpation –

Distal pulses (rule out vascular claudication) – normal
Temperature – cold clammy feet

Gait analysis on short stride walking – slow, wide based gait, no antalgia

Test of balance – tandem gait and Romberg test.

Findings – walks in straight line with difficulty, Romberg positive for sensory ataxia

Lower back exam – inspection, palpation, lumbar ranges of motion, Facet loading test.

Palpation. Straight leg test

Findings – normal

Neurological exam –

- **Cranial Nerves** - normal

- **Sensory exam**

Light touch and pinprick: Reduced light touch and pin prick sensation in diffuse distal third of leg, ankle and foot bilaterally and fingertips of all fingers.

○ **Semmes Weinstein 10g Monofilament testing** (optional) – inability to feel in bilateral feet and ankles, normal perception at knees.

○ **Proprioception:** Impaired proprioception at the great toes bilaterally with normal proprioception at the ankles.

○ **Temperature testing with hot and cold test tube** – impaired temperature perception to both hot and cold in both ankles and feet

○ **Vibration testing** (tuning fork – 256 Htz) – reduced at distal joints – ankle and great toe, and, normal at knees and above.

- **Motor strength testing** – all myotomes of lower extremity – normal

- **Deep tendon Reflexes** – 1+ for both Achilles and 2+ for knee.

Case 2 – Answer Key

3. What investigations do you want to order to confirm your diagnosis? (eg. imaging, bloodwork)

1) Bloodwork:

1. Complete Blood Count (CBC): Normal

- Rule out anemia or other hematological abnormalities that may contribute to neuropathy.

2. Comprehensive Metabolic Panel: Normal Creatinine, Glomerular filtration rate, alanine transaminase (ALT)

- Evaluate kidney and liver function, as well as electrolyte levels.

3. Thyroid Function Tests: TSH Normal

- Thyroid dysfunction can contribute to neuropathic symptoms.

4. Serum protein electrophoresis: Normal

- To assess for monoclonal gammopathy

5. HbA1c (Glycated Hemoglobin) or fasting glucose: 0.09L

- To assess long-term glycemic control and confirm the presence of chronic hyperglycemia.

6. Vitamin B12 Levels: Normal

- To rule out nutritional deficiencies contributing to neuropathy.

2) Nerve Conduction Studies (NCS) and Electromyography (EMG):

Objective tests to assess the extent and severity of nerve damage. NCV studies reveal reduced sensory nerve action potential (SNAP's), and mildly reduced compound muscle action potential (CMAP's) suggestive of predominantly distal symmetrical length dependent sensory axonal polyneuropathy.

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3) Ankle-Brachial Index (ABI): normal

- a. To assess peripheral arterial circulation and rule out PAD. - Normal

4) Xray +/- MRI Lumbar Spine: moderate degenerative disk disease in lumbar spinal; no spinal canal stenosis

- a. If indicated, to evaluate for lumbar radiculopathy or other structural abnormalities.

Case 2 – Answer Key

4. Give your diagnosis and provide a comprehensive psychiatric treatment plan (ie. for treatment of current symptoms and prevention of symptom progression).

Diagnosis: Diabetic Peripheral Neuropathy (DPN):

Glycemic Control:

- Optimize blood glucose levels through lifestyle modifications, including a balanced diet, regular exercise, and medication adherence. Coordination with an endocrinologist for diabetes management is crucial.

Pain Management:

- Pharmacological:
 - o Anticonvulsants (e.g., gabapentin, pregabalin) and certain antidepressants (e.g., duloxetine, amitriptyline) may be prescribed for neuropathic pain. These medications can help alleviate symptoms and improve quality of life.
 - o Topical creams containing capsaicin or lidocaine can provide localized relief from neuropathic pain.
- Non-pharmacological: desensitization techniques etc. as needed

Foot Care:

- Emphasize the importance of proper foot care to prevent complications. This includes regular foot inspections, wearing comfortable shoes, and maintaining good hygiene. Referral to a podiatrist for specialized foot care may be beneficial.

Physical Therapy and Fall Prevention:

- Physical therapy can help improve balance, strength, and coordination, reducing the risk of falls. Specific exercises can also address neuropathic symptoms.

Multidisciplinary Approach:

- Collaboration with specialists, including neurologists, endocrinologists, and physical therapists, can provide comprehensive care. Regular communication among healthcare providers is crucial for optimal management.
- Referral to diabetic education clinic
- Referral to chiropodist

Case 2 – Answer Key

Reference:

1. Mirian A, Aljohani Z, Grushka D, Florendo-Cumbermack A. Diagnosis and management of patients with polyneuropathy. *CMAJ*. 2023 Feb 13;195(6):E227-E233. doi: 10.1503/cmaj.220936. Erratum in: *CMAJ*. 2023 Mar 20;195(11):E415. PMID: 36781195; PMCID: PMC9928442.