UNIVERSITY MEDICINE • EXERCISE SHEET

9.7 Lesion localisation

Name: _____ Class: _____ Date: _____ **Total: 24 marks**

KEY WORDS Babinski sign

Objective

Localise a fictional case, level by level, with reasons.

1 Key knowledge and worked examples

■ The four signatures

Cortical: higher function + contralateral signs. Brainstem: crossed (ipsilateral cranial nerve, contralateral body). Spinal: sensory level, UMN below, LMN at level. Peripheral: nerve/root territory, LMN, no UMN ✓.

■ Worked example: the climb

Right lower-face weakness (brow spared) + left hemiparesis + aphasia → cortex; UMN VII; above the pyramids → left MCA territory ✓.

2 Practice

2.1 Which level owns crossed findings? [3]

2.2 What single feature does the cord contribute that no other level has? [3]

2.3 A peripheral pattern WITH UMN signs – what does the map say? [3]

3 Exam-style questions

3.1 A fictional case: right facial weakness sparing the brow, left hemiparesis, non-fluent speech.

Climb stepwise: aphasia → cortex; brow-sparing facial weakness → UMN VII above the nucleus; contralateral hemiparesis → corticospinal above the pyramids; conclude LEFT middle cerebral artery territory ✓. Give the reason at each rung. [8]

3.2 A fictional case: burning both feet, absent ankle jerks, normal plantar responses, no trunk level.

Assign the pattern (peripheral, length-dependent polyneuropathy) and justify each sign. Contrast the cord-compression pattern (a trunk sensory level with UMN signs below). State the one finding that would break the peripheral pattern (plantars upgoing – motor neuron disease territory) ✓. [7]

Solutions

2.1

- The brainstem – tracts cross there, cranial nerves exit ipsilaterally ✓.

2.2

- A sensory LEVEL (a segmental boundary on the trunk) ✓.

2.3

- The exception that proves the map – motor neuron disease (both UMN and LMN degenerate) ✓.

3.1

- Non-fluent speech → language cortex involved, LEFT hemisphere ✓.
- Brow-sparing right facial weakness → UMN VII lesion above the nucleus ✓.
- Left hemiparesis → corticospinal tract above the pyramidal decussation ✓.
- Convergence: left middle cerebral artery territory ✓.

3.2

- Symmetric, distal-first, no level → peripheral (length-dependent polyneuropathy) ✓.
- Absent ankle jerks = LMN/reflex-arc loss; normal plantars = no UMN ✓.
- Cord compression instead shows a trunk sensory LEVEL with UMN signs below ✓.
- Upgoing plantars with LMN signs would break the peripheral pattern (motor neuron disease) ✓.

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