9.2 Somatosensory and pain pathways

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

KEY WORDS dorsal column • spinothalamic tract

Objective

Trace the two sensory tracts and read their crossings off a deficit.

1 Key knowledge and worked examples

■ The two crossings

Dorsal column (fine touch, vibration, proprioception): ascends ipsilaterally, crosses in the MEDULLA ✓. Spinothalamic (pain, temperature): crosses in the CORD within 1–2 segments of entry ✓.

■ Worked example: the hemicord mirror

Left hemicord injury at T10 → left loss of vibration and proprioception below, right loss of pain and temperature ✓. Gate control: Aβ fibres close the gate on C-fibre pain.

2 Practice

2.1 Which tract crosses in the cord, and within how many segments? [3]

2.2 Why does rubbing a knock ease the pain? [3]

2.3 Diaphragm pain is felt at the shoulder tip – name the shared segments. [3]

3 Exam-style questions

3.1 A fictional patient stabs a pen into the LEFT side of the cord at T6.

Trace all four findings: (i) side and modality of fine-touch loss below, (ii) side and modality of pain loss below, (iii) which finding starts 1–2 segments lower, and why each follows its crossing. [8]

3.2 A fictional patient has burning pain from both feet, length dependent.

Explain why this is NOT a cord hemisection pattern (no level, no crossed modalities). State the expected reflex findings of a length-dependent peripheral pattern (absent ankle jerks, normal plantars). [7]

Solutions

2.1

- The spinothalamic tract – within 1–2 segments of entry ✓.

2.2

- Aβ touch traffic inhibits C-fibre pain in the dorsal horn – gate control ✓.

2.3

- C3–C5, shared by diaphragm and shoulder skin ✓.

3.1

- (i) LEFT fine touch/vibration/proprioception loss below T6 – the dorsal column has not crossed ✓.
- (ii) RIGHT pain/temperature loss below – fibres already crossed in the cord ✓.
- (iii) The pain loss starts 1–2 segments BELOW the lesion – fibres ascend briefly before crossing ✓.
- Each finding follows its own crossing level; together they name a hemisection.

3.2

- Symmetric, length-dependent, no sensory LEVEL – not a cord pattern ✓.
- No crossed modality split (both modalities lost together in the feet).
- Peripheral pattern: distal LMN signs – absent ankle jerks with normal plantar responses ✓.

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