Differentiating C8 Radiculopathy From Ulnar Neuropathy: How Knowledgeable Are Experienced Spine Surgeons?

Introduction: C8 radiculopathy (C8R) is relatively uncommon while ulnar neuropathy (UN) is common. As a result, many spine surgeons have a difficult time differentiating C8R from UN. While EMG/NCS can help, they have a 20% false negative rate. Hence the physical exam is critical. Most surgeons only test grip strength and don’t know which intrinsic hand muscles are innervated by C8 and T1. In order to determine how knowledgeable experienced spine surgeons are about differentiating between C8-T1 radiculopathy and ulnar neuropathy we administered a questionnaire designed to test their knowledge.

Methods: 24 experienced cervical spine surgeons completed a questionnaire that asked: 1. If you cut the ulnar nerve at the elbow, which of the following would be numb: A) ulnar forearm, small & ring fingers B) Only the ulnar forearm C) Only the small & ring fingers D) None of the above. 2. Which of the following muscles are weak with a C8R but normal UN? Flexor digiti minimi brevis, Flexor pollicis brevis, Abductor digiti minimi, Abductor pollicis brevis, Adductor pollicis, Opponens digiti minimi, Opponens pollicis, Medial lumbricals, Lateral lumbricals, Dorsal interossei, Palmar interossei.

Results: Only 15/24 (58%) surgeons correctly answered #1 that cutting the ulnar nerve would only result in numbness to the small and ring fingers. 0/24 correctly identified all 4 C8-T1 innervated muscles without naming additional muscles. While 1 named all 4, he also named 6 others incorrectly. 1 surgeon identified 2 correct muscles, another 2 correct and 1 incorrect.

Conclusion: The ulnar nerve only provides sensation to the ring+small fingers and ulnar border of the hand. It does not provide sensation to the ulnar forearm, which is innervated by the medial brachial cutaneous nerve, arising from C8-T1. All intrinsic hand muscles are innervated by the ulnar nerve, EXCEPT 4 that are innervated by the median nerve (which is supplied by C8-T1): abductor & flexor pollicis brevis, opponens, and the lateral lumbricals. By examining these 4, one can differentiate between UN, which leaves these 4 intact, versus a C8R which would result in weakness of these muscles. Despite the fact that all of these surgeons considered themselves highly experienced cervical spine surgeons, our study revealed that their knowledge regarding C8N vs UN was poor. Much of this may be the fault of our spine educational system, which neglects hand function, critical for differentiating peripheral from cervical pathology. We recommend improving this part of the spine curriculum.