



CASE REVIEW

# Upper extremity paraesthesia: Clinical assessment and reasoning

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## KEYWORDS

Assessment;  
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Spondylosis;  
Multiple etiological features

**Summary** The art of clinical assessment involves an accurate determination of the cause(s) of a patient's symptoms. Given that a set of symptoms can be influenced by many contributing factors and features, assessment needs to differentially evaluate these. Accurate and appropriate treatment depends on differential assessment based on sound clinical reasoning. Many conditions derive from multiple causes demanding evaluation of as many etiological features as can be identified. The case review presented here involves a patient presenting with paraesthesia spreading into her right upper extremity. A complex history, involving her neck and contralateral upper extremity was assessed. The patient was found to have at least seven underlying, predisposing, and etiological, conditions capable of initiating, aggravating, or maintaining the presenting symptoms. Weighing the relative contributions of these often interacting features, and correlating this with the history, helped to identify a successful course of treatment.

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## Introduction

When a patient presents with a set of symptoms, the first responsibility of the practitioner (therapist/physician) is to determine the causative factor(s). Determining whether the patient is experiencing the effects of condition 'A' or condition 'B' demands differential assessment. When approaching differential assessment, it is important to remember that "There is no law that a patient cannot have more than one condition." Those

words, stated 25 years ago by an instructor of orthopedics at the author's chiropractic school, helped shape the author's approach to clinical assessment in professional practice.

In fact, the very premise of trying to determine whether a patient has condition A or condition B is not necessarily correct, and may distort the assessment process. All too often, a patient is experiencing the effects of more than one condition. When a person experiences the effects of a particular musculoskeletal condition, unless care is sought soon after the onset, it is likely that he or she will develop additional, symptom-inducing or

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symptom-aggravating, musculoskeletal, neurologic, or possibly stress-related, adaptive and compensatory changes.

Therefore, the art of assessing a patient's presenting symptoms often involves the need to assess the relationship(s) between multiple conditions. If this concept is kept in mind, assessment can be less confusing, particularly when positive findings emerge that do not all support each other, but rather point to multiple possible causes. Once all assessments have been made, it is then the task of the practitioner to prioritize the relative weight of the findings by correlating them with the patient's past history and recent activities, and to then choose a treatment plan that is best suited to the care of the individual.

The following case study illustrates this process:

An active middle-aged woman, presented with a complaint of tingling in the anterior aspect of her right thumb, index, and middle fingers. She also noted mild/moderate pain at the lateral side of the right elbow joint region, centered at the lateral epicondyle. As her previous history is significant, it is summarized below:

## Previous history

This woman had been the author's patient for approximately 5 years when she presented with the symptoms as described above. She had previously been treated by the author for low back pain as well as a neck condition that referred down her left upper extremity.

Upon her initial evaluation, frontal plane postural assessment revealed bilateral over-pronation of the subtalar joints (loss of the arches of the feet) upon weight bearing, with the degree of over-pronation greater on the left than right side (this was assessed by visual examination of the height of the medial longitudinal arches from the anterior view). Her iliac crest and shoulder girdle were slightly low on the right side.<sup>1</sup> Sagittal plane postural assessment revealed a slight degree of head/upper cervical protraction. Transverse plane postural assessment was unremarkable.<sup>2</sup>

<sup>1</sup>It is of interest that the iliac crest was low on the side that exhibited less pronation. The usual pattern is for the side with greater pronation to be lower due to the loss of arch height (Muscolino, 2006b, p. 605). However, the patient exhibited hypertonicity of the right side hip joint abductor (pelvic depressor, i.e., lateral tilt) musculature, which would be consistent with the postural asymmetry as described.

<sup>2</sup>It should be added that in this case the patient's respiration and nutritional status were not evaluated. These are factors that may contribute to the conditions that occur within this case

The neck condition had started after doing yard work one weekend. Upon examination, she was found to have cervical joint dysfunction and a left upper trapezius trigger point that, when compressed, reproduced the characteristic arm symptoms that she was experiencing.<sup>3</sup> Given the reproduction of her symptoms, it seemed clear that the trigger point related to her symptoms. However, when treatment aimed at deactivating the trigger point did not achieve satisfactory results, a cervical spine MRI was ordered. The results showed mild cervical spondylosis (degenerative joint disease/osteoarthritis) of the neck at the C3–C4 level and marked spondylosis at the C5–C6 and C6–C7 levels. Rest, icing, and anti-inflammatory medication (prescribed by her orthopedic physician) were recommended and the symptoms gradually resolved.

Four years later, her left side neck and upper extremity symptoms returned, with no precipitating trauma or event. A second MRI of the cervical spine was performed which showed that the cervical spondylosis found in the initial MRI had progressed to now include mild central canal stenosis at the C5–C6 and C6–C7 levels. Additionally, there was left-sided foraminal encroachment at the C4–C5 level. The patient was also experiencing chills and a feeling of pressure within the skull. After consulting with an orthopedist and hematologist, she was diagnosed with Lyme disease and a Parvo virus infection. She was prescribed prednisone and antibiotics and her symptoms were greatly reduced, but she remained with low grade, constant, neck pain, worse on the left but also somewhat present on the right.

By this time, she was also diagnosed as being clinically depressed and prescribed anti-depressant medication. She reported that her left neck pain was exacerbated whenever she experienced emotional stress. It was the patient's opinion that the

(footnote continued)

study. Dysfunctional respiration may load the accessory breathing muscles, thereby affecting cervical/shoulder musculature. Dysfunctional breathing (and poor nutrition) may potentially alter pH, disturbing calcium/magnesium levels, thereby modifying neural function/motor control, as well as reducing pain threshold (with additional potential for encouraging the evolution of myofascial trigger points via ischemic influence) (Chaitow et al., 2002, p. 100). Further, nutritional imbalance may potentially encourage inflammatory processes and generally influence somatic function.

<sup>3</sup>This referral pattern into the upper extremity experienced by the patient is not typical for an upper trapezius trigger point (Travell and Simons, 1999, pp. 279–280). One possible explanation might be that her pain pathways were facilitated, accounting for their reproduction with pressure into the upper trapezius trigger point.

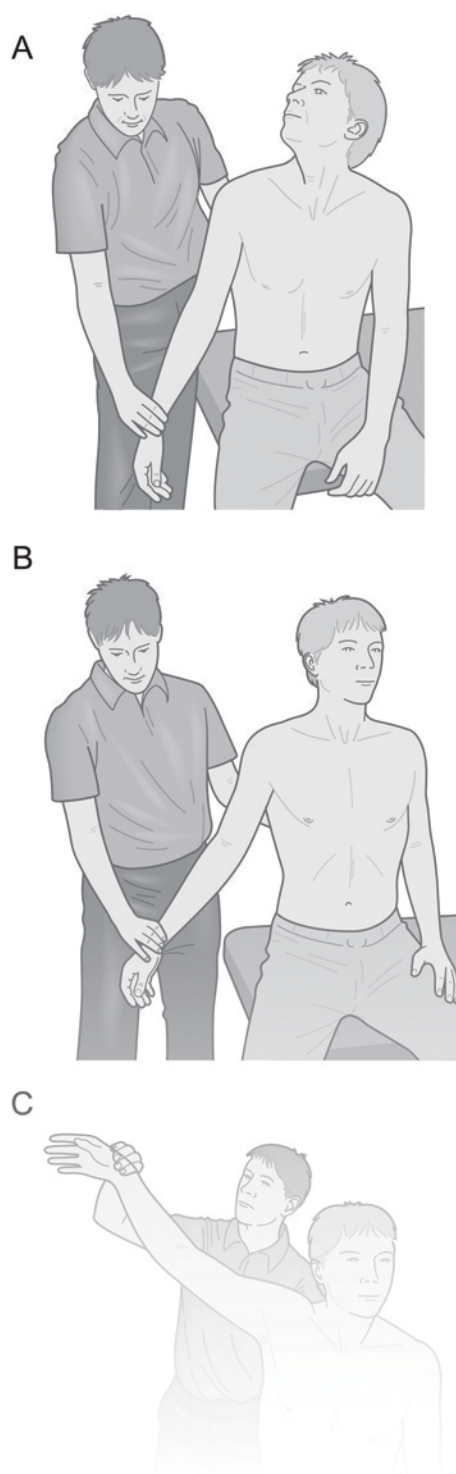
depression was secondary to the emotional stress of her chronic ongoing neck pain. Her neck pain was treated with physical therapy and acupuncture, with little further improvement.

Approximately 6 months later, the patient experienced left upper extremity tingling again; however, this time it extended all the way into her hand (again with no precipitating trauma to account for it). Searching for other possible factors, assessment procedures for thoracic outlet syndrome (TOS) were performed (see Figure 1). Eden's procedure was positive (diminishing the strength of the radial pulse and reproducing the symptoms into the left hand) indicating costoclavicular syndrome, a form of TOS; and Wright's procedure was positive (with a diminution in the strength of the radial pulse), indicating pectoralis minor syndrome, another form of TOS. Extension of the neck and head also reproduced the hand tingling. Beyond this, she certainly still had marked spondylosis of the cervical spine, and had multiple palpable trigger points in the neck and upper back musculature. Treatment was aimed primarily at the TOSs and her neck/upper back trigger points. This comprised ultrasound, electrical muscle stimulation, heat, and deep tissue massage; her condition gradually improved. The method of treatment used to treat the trigger points was deep stroking massage (Travell and Simons, 1999, p. 141). Deep stroking massage consists of approximately 30–60 short strokes performed upon the trigger point with moderate to deep pressure; further, these strokes are oriented along the direction of the taut band within which the trigger point is located, with the muscle passively stretched without pain.

Figure 1 illustrates the three orthopedic assessment procedures for the three forms of TOS.

*Note:* During each test, the pulse is assessed in order to see whether it is abolished or diminished, during adoption of the test position. If the pulse is so modified the test is positive for TOS.

Figure 1A depicts Adson's test in which the patient stretches the anterior and middle



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