Q&A

Pain in the Neck:
Could it be Neurological?

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Neck pain is the third most common musculoskeletal complaint seen by family doctors. In most instances, a specific diagnosis is elusive and the complaint is self-limited. However, it is important to identify patients in whom neck pain has a serious cause and those in whom a neurological disorder is present. Accordingly, the approach to a patient with neck pain can be distilled into four questions.

Q&A *Is there a sinister pathology?*

Serious diseases presenting as neck pain are uncommon, but a high index of suspicion is warranted if there is a known history of:

- systemic malignancy (vertebral metastases),
- unremitting localized pain or fever (soft tissue abscess, osteomyelitis), or
- recent neck trauma (occult fracture).

Patients with any of these features and all patients > 50-years-age with new-onset neck pain should have cervical spine x-rays and sometimes further investigations.

Q&A *Is it "just neck pain" or could this be radiculopathy?*

The key to identifying radiculopathy is a careful history. The patient should be asked about

Kate's case

Kate, 52, is a healthy cellist, but has had intermittent mild neck pain for four years. In the last six months, she has felt pain around the right scapula, especially when she lifts anything heavy. There is an intermittent pins and needles feeling from the right scapula to the elbow. In the last month, she has been waking at night because of these symptoms and she has begun to avoid playing her cello because of the pain.

Examination

Kate has limitation when turning her head to the right. There is mild weakness of right elbow extension, with normal:

- shoulder abduction,
- elbow flexion,
- wrist and finger extension and
- intrinsic hand muscles.

The right triceps reflex is decreased. The following reflexes are normal:

- biceps,
- brachioradialis and
- left triceps.

Reflexes in the legs are normal, with flexor plantar responses. Sensation is normal.

Questions

1. What is your diagnosis?
2. What investigations (if any) would you arrange?
3. Should Kate be referred to a neurologist or neurosurgeon?

For Kate's follow-up, look to page 84.

three symptoms in particular:

1. Does the neck pain radiate? Radiation into the shoulder, arm, or between the scapulae suggests nerve root pathology
2. Do neck movements or Valsalva maneuvers (cough, sneeze, straining) worsen or cause radiation of pain? This feature is virtually diagnostic of radiculopathy, although it only occurs in a minority of patients
3. Is there associated numbness or weakness in the hand or arm?

Q&A *If it is radiculopathy, which root?*

While the characteristics of the pain are helpful to identify that the patient has a radiculopathy, pain is rather unhelpful for more precise localization. However, the distribution of numbness can be informative. Ask the patient which digit(s) are numb:

- numbness of the thumb implicates the C6 root,
- the index, middle and ring fingers implicate C7 and
- the little finger implicates C8.

C5 radiculopathies generally do not produce numbness below the elbow. Examination of muscle power and reflexes may add further information. Muscle power testing is most useful if one aims to carefully assess a limited set of muscles, rather than trying to examine every muscle in the upper limb. The muscles I rely on are listed in Table 1. I prefer these as they include all the relevant myotomes and can be tested reliably. Pay particular attention to the triceps, as even significant weakness of elbow extension is often unrecognized by patients and because C7 radiculopathy is by far the most common.

Q&A *Is the spinal cord involved?*

Unlike in the lumbar spine, pathologies in the neck that compromise nerve roots may also involve the immediately adjacent cervical spinal cord. In other words, what appears to be a cervical radiculopathy may in fact be a radiculomyelopathy, a potentially much more serious problem. Practically speaking, in a patient with cervical radiculopathy, one must also ask about sphincter function and gait and look for upper motor neuron signs in the legs. (In fact, cervical spondylotic arthritis is so common in the elderly that the possibility

Table 1

Typical findings in cervical radiculopathy

Root	Numb digit	Weakness	Absent reflex
C5	None	Shoulder abduction (deltoid)	Biceps, brachioradialis
C6	Thumb	Elbow flexion (biceps)	Biceps, brachioradialis
C7	Index, middle, ring	Elbow extension (triceps)	Triceps
C8	Little	Intrinsic hand muscles (interossei)	Finger flexor

Kate's case cont'd...

The distribution of the pain, its aggravation by straining when lifting and the associated paresthesia are all very suggestive of radiculopathy.

Diagnosis

The neurological examination points to C7 nerve root dysfunction. The likely pathological process is an intervertebral disc protrusion, possibly on a background of cervical osteoarthritis. There are no red flags to make one worry about a more serious underlying disease.

Treatment

You prescribe ibuprofen for daytime symptoms and suggest that Kate try a soft cervical collar at night. In view of the persistence and functional impact of her symptoms, you wonder if Kate may need a surgical referral.

You arrange a cervical spine MRI scan, which shows a right lateral herniation of the C6 and C7 intervertebral discs, plus foraminal stenosis at several other levels. The MRI findings suggest that surgery is a potential option, but at her follow-up visit three weeks later, Kate reports that her pain has decreased. You elect to continue conservative management.

Follow-up

At follow-up three months later, Kate's nocturnal pain is gone and her triceps strength is nearly normal. Six months later, she has returned to normal.

of cervical radiculomyelopathy should be considered in any patient with difficulty walking, even if there is little neck pain).

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Investigation of cervical radiculopathy

Unless a sinister cause of neck pain is suspected, there is debate about what, if any, further investigation is needed. As with any diagnostic testing, will the results alter the patient's management? A MRI scan is the best imaging modality for the neck, but often demonstrates disc or osteoarthritic abnormalities at multiple levels without clarifying the source of the patient's symptoms. Electromyography (EMG) can confirm one's clinical impression, but it is often normal in patients with clear symptoms of radiculopathy. EMG may allow one to distinguish new abnormalities from old ones.

Treatment of cervical radiculopathy

In the majority of patients with cervical radiculopathy due to disc or osteoarthritic pathology, the natural history is favourable. Most patients will recover with time. Therefore, the basic principle of treatment is to control pain while awaiting spontaneous recovery. Treatment may include:

- avoiding activities that precipitate pain,
- the use of a cervical collar to limit neck movements and
- analgesics.

I start with non-steroidal anti-inflammatory drugs, but have a low threshold to use short courses of opioids, particularly when pain interferes with sleep. Sometimes drugs for neuropathic pain (*e.g.*, 10 mg to 25 mg of amitriptyline q.h.s. or 300 mg of gabapentin q.i.d.) can be useful. Most patients can expect to begin improving within two to four weeks with the above measures.

Take-home message

- The key to diagnosing cervical radiculopathy is to take a careful patient history
- Use tendon reflexes and selected muscles to identify the symptomatic nerve root
- Most patients will spontaneously improve within one month: reserve further diagnostic testing for those with persistent symptoms

A myriad of conservative therapies are available. These include:

- neck manipulation,
- transcutaneous electrical nerve stimulation,
- acupuncture,
- massotherapy,
- pulsed electromagnetic field therapy,
- iontophoresis and
- multidisciplinary biopsychosocial rehabilitation, *etc.*

Are any of these therapies superior to the condition's generally favourable natural history? For mechanical neck pain, there is some evidence of benefit with acupuncture and multimodality programs of exercise, mobilization and manipulation. However, for cervical radiculopathy, there is essentially no evidence for or against any of these conservative treatments.

When to refer?

Referral to a neurologist may be worthwhile if:

- the diagnosis is unclear (and this may vary according to the individual practitioner's experience),
- there is a background of previous neurological problems, or
- the symptoms have not begun to improve within a month.

In the latter situation, imaging and EMG will usually be indicated, with an aim to assess whether the patient should undergo surgery. There is an ongoing debate about the "best" surgical technique (anterior vs. posterior, fusion or not), although the evidence that any surgery is superior to conservative treatment is not very strong. The only randomized controlled trial showed that pain relief was better in surgical patients at three months follow-up. But at one year, those patients conservatively-treated of the surgical patients, had similar outcomes.[1] Dx

Reference

1. Persson LC, Carlsson CA, Carlsson JY: Long-lasting cervical radicular pain managed with surgery, physiotherapy, or a cervical collar. A prospective, randomized study. Spine 1997; 22(7):751-8.

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