Cervical Radiculopathy and Migraine

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Read the cases of 4 patients whose chief complaint is a 2-week history of neck pain, try your hand at making a quick diagnosis, then go to the next page to read the outcome.

In many outpatient practices, Monday morning is the time when new patients are evaluated. Squeezing in new patients between routine follow-ups can make Mondays especially hectic.

This is the first installment of a new editorial feature that focuses on typical Monday morning patients—each with the same chief clinical complaint, but with different causes. I invite you to read the cases of 4 patients whose chief complaint is a 2-week history of neck pain. Each patient went to the emergency department over the weekend and received an MRI scan of the neck. "Degenerative disk disease" was diagnosed in the 3 adult patients. "Neck strain" was diagnosed in the adolescent. All patients were advised to follow up with their primary care doctor on Monday.

Try your hand at making a quick diagnosis . . . then go to the next page to read the outcome.

PATIENT NO. 1
Mrs Dean is a 42-year-old obese nurse who presents with a 2-week history of pain in the back of her neck. She attributes the pain to her stressful job at the nursing home. She proceeds to describe unfair treatment by an unsupportive boss and how her husband won't help drive the kids to their numerous activities.

PATIENT NO. 2
Ms Jeffries is a 14-year-old high school student whose neck has been bothering her. She just returned to classes after a school break and has been under a lot of stress. After a particularly hectic day a couple of weeks ago, her neck began to hurt. Normally, nothing keeps her from studying late at night, but the neck pain prevents her from bending forward to read. When she gets this pain, she just wants to go to bed. She had this same trouble when she was in middle school, but didn't have to spend as much time studying then, so she'd just go to bed and sleep when the pain developed and she'd be fine the next day.

PATIENT NO. 3
Mr Sanford, a 36-year-old auto mechanic, is very concerned that he can't do his job because of severe neck pain. He has worked as a mechanic for the past 15 years, and supports his family of 5 on his salary. He says nothing is wrong besides neck pain and that he just wants some pain pills so he can get back to work. The pain is so bad that he even feels unsteady when he walks.

PATIENT NO. 4
Mrs Grace is a 67-year-old recently retired schoolteacher who has been "really slowing down" because of neck pain. When she wakes up in the morning, she feels like a "stiff old lady." Once she gets moving, she feels more like her old self. The neck pain started bothering her when she began painting her kitchen 2 weeks ago. She's fine for the first 30 minutes, but then her neck really bothers her the longer she keeps painting. She also notices neck pain when she's getting dishes out of her upper cabinets.

What are the likely causes of neck pain in these 4 patients? (Go to Page 2 to find out.) Although these chief complaints and brief histories are typical, none of these 4 patients has provided enough information to formulate an educated diagnosis. Even though each patient has the same primary complaint, differences in history and examination provide ready clues to diagnostic possibilities. Extracting these important features depends on a targeted evaluation that focuses on high-yield questions and on examination findings that help distinguish among the many possible causes of neck pain.

A HIGH-YIELD, TARGETED EVALUATION OF NECK PAIN
The same examination principles apply to each patient regarding features in the history, physical examination findings, and the need to proceed with testing. Details of the targeted examination are outlined in the Table.
It is important to target specific examinations to specific clinical scenarios to help confirm or refute clinical diagnoses. Imaging studies of the spine are notorious for producing false-positive results. For example, degenerative cervical disk disease—the putative diagnosis for each of the adult patients presented here—has been identified on MRI scans in 25% of asymptomatic persons younger than 40 years and in nearly 60% of asymptomatic persons 40 years and older.\(^1,2\) In another MRI study of symptom-free young adults (ages 24 to 26 years), MRIs identified cervical disk degeneration in 29% and disk bulges in 32%.\(^3\) Similarly, plain x-ray films become "abnormal" with aging—even in asymptomatic persons.

**PATIENT NO. 1**

Mrs Dean, the 42-year-old obese nurse  
**HISTORY**

- Her neck pain began after she lifted a heavy patient at work.
- She notices pain going into her right hand.
- Since the pain began, she has had a tingling in her right middle finger.
- She had a "slipped disk" in her low back 7 years earlier.

**TARGETED EXAMINATION**

- Active range of motion is restricted because of pain, but she has full passive range of motion when the examiner moves her relaxed neck.
- Neurologic examination of the right upper extremity shows reduced strength with arm extension at the elbow, depressed triceps reflex, and numbness over the palm and middle finger. Reflexes, strength, and sensation are normal in the other extremities. Gait is normal.

**TESTING**

- Electromyography (EMG) and nerve conduction studies confirmed a right C7 radiculopathy.
- Cervical MRI shows a right-sided herniated disk at C6-7.

**DIAGNOSIS:**  
RIGHT C7 RADICULOPATHY

Mrs Dean has several risk factors for radiculopathy, including obesity, heavy work duties, and a history of lumbar disk disease. A survey of 561 patients with cervical radiculopathy revealed a history of lumbar radiculopathy in 41%.\(^4\) Physical examination shows good range of motion of the cervical joints and a C7 cervical radiculopathy. The clinical impression of cervical radiculopathy is confirmed by both EMG and MRI testing. A survey of patients with clinically diagnosed cervical radiculopathy found EMG abnormalities in 52% and MRI abnormalities in 48%.\(^5\) As expected, an abnormal result on either test was most frequent in patients like Mrs Dean, who have more definite
clinical signs of radiculopathy.

**PATIENT NO. 2**  
Ms Jeffries, the 14-year-old high school student  
**HISTORY**

- She gets bouts of neck pain about twice a month—and always with her menstrual period.
- When she gets neck pain and tenderness, she usually tries to go home to sleep. When she does, she wakes up in a couple of hours feeling fine. If she can't go to sleep, the pain creeps over her head until one side of her head is throbbing and she feels nauseated. If she can't go right to sleep, she'll usually throw up and then feel better.
- She rarely has these bouts of neck pain during school vacations or on weekends.

**TARGETED EXAMINATION**

- Full range of motion of her neck, with mild tenderness over the trapezius muscles bilaterally.
- Normal neurologic screening examination results.

**TESTING**

- No testing is ordered.

**DIAGNOSIS:**  
MIGRAINE WITH NECK PAIN  
Migraine is often preceded by or associated with neck pain. In one study, neck pain associated with migraine attacks was reported by 70% of 200 migraineurs without aura. Migraineurs often report a significant association between neck symptoms and migraine, including headache beginning with neck pain, headache associated with aggravation of neck pain, and neck tenderness during migraine. Physical examination may identify myofascial trigger points in 79% of migraineurs. Mechanical or joint dysfunction is rarely identified in migraineurs. As is common in children and adolescents, Ms Jeffries's migraines typically occur with menses and school stress. A survey of 320 children with chronic headache showed a strong association between school and migraine. In that study, 80% of children who had migraine without aura had significant improvement or complete relief of attacks during school breaks (like Ms Jeffries). In only 30% of migraineurs were after-school activities limited. Sleep deficiency and exposure to computers were also identified as significant headache triggers. Migraine attacks are typically aggravated in girls during adolescence, possibly because of hormonal changes of puberty, changes in sleep patterns, and increased school stress. **PATIENT NO. 3**  
Mr Sanford, the 36-year-old mechanic  
**HISTORY**

- About 1 week after the neck pain started, Mr Sanford noticed some tingling and numbness in his hand, as well as dizziness.
- Mr Sanford is a smoker. He is currently being treated for both hypertension and hypercholesterolemia.

**TARGETED EXAMINATION**

- There are no restrictions of active neck movement.
- His eyelid is slightly drooped on the left, and sensation is decreased over the left side of the face. Sensation to pinprick is decreased in the right upper extremity.
- While walking, he tends to fall toward the left.

**TESTING**

- An MRI scan of the brain shows an infarct in the lateral medulla. A crescent-shaped high signal is noted at the left vertebral artery; this is consistent with a hematoma.
- Narrowing of the lumen in a segment of the left vertebral artery (string sign) is identified on angiography.

**DIAGNOSIS:**  
LEFT VERTEBRAL ARTERY DISSECTION
Vertebral artery dissection may occur after neck manipulation, trauma (eg, whiplash injury), sports or exercise, or prolonged working in cramped spaces (as in Mr Sanford's case). In one survey of 46 patients with vertebral artery dissection, neck pain was reported by 72% and headache by 50%. In a similar report of 26 patients with vertebral artery dissection, pain involving the neck or head (predominantly occipital) was a prominent feature in 85% and preceded the development of neurologic deficits in 53%. Vertebral artery dissection occurs in men slightly more often than in women (59% vs 41%), with a mean age at onset of 42 years. Hypertension, hypercholesterolemia, and smoking are all risk factors for vertebral artery dissection.

Mr Sanford’s clinical presentation is typical for lateral medullary infarction or Wallenberg syndrome: facial numbness; Horner syndrome; and ataxia on the side of the infarction, with extremity numbness to pinprick and temperature on the opposite side.

PATIENT NO. 4
Mrs Grace, the 67-year-old retired schoolteacher

**HISTORY**
- When she holds her head in one position for a long time (eg, when painting high walls or ceilings), the neck pain radiates over the back and side of her head.

**TARGETED EXAMINATION**
- Active and passive range of motion of the cervical spine is decreased. As the relaxed neck is passively moved, crepitus may be appreciated. The paraspinal muscles are tender, and palpation triggers a head pain.
- Results of the neurologic screen are normal.

**TESTING**
- X-ray films of the cervical spine show several large osteophytes and disk-space narrowing.

**DIAGNOSIS:**
OSTEOARTHRITIS WITH CERVICOGENIC HEADACHE
Cervicogenic headache is defined as headache that occurs with symptoms and signs of neck pain. Neck pain is a prominent feature, and head pain is typically provoked by neck movements, prolonged posture, or palpation. Cervical range of motion is also typically decreased, as in this patient. Significant cervical pathology may be identified with imaging studies. Women are 4 times more likely than men to have cervicogenic headache; the mean age at onset is 43 years. In the United States, osteoarthritis affects 68% of adults 55 years and older. Osteoarthritis generally affects the spine and large weight-bearing joints. Osteoarthritis pain typically worsens with activity. Morning stiffness is also common. As with Mrs Grace, the typical physical examination shows joint tenderness, crepitus on motion, and restricted passive range of motion. **NOT EVERY PAIN IN THE NECK IS CERVICAL**

Although each of these 4 patients presented with neck pain, the cervical spine was not the origin of symptoms for each. A high-yield, targeted history and examination can help you achieve quick and accurate diagnoses.

So the next time you see a "pain in the neck" in your office, remember that neck pain may be associated with a variety of clinical diagnoses.

**Editor's note:** "Monday Morning Patients: Pains in the Neck" is the first in Dr Dawn Marcus's series "Clinics in Pain Medicine." This feature made its debut in our sister publication Headache & Pain: Diagnostic Challenges, Current Therapy in June 2005. Dr Marcus is a distinguished member of the editorial board of Headache & Pain. Her column will appear in that journal as well as in Consultant.

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