Anemia, Paresthesias, and Gait Ataxia in a 57-Year-Old Denture Wearer

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CASE

A 57-year-old man developed numbness and tingling in his toes, which progressed over 3 to 4 months to involve his legs, hands, and lower torso. He then developed trouble walking owing to imbalance and had increasingly frequent falls. His hands felt clumsy, and he began dropping objects. He reported several instances of urinary incontinence in the weeks before presentation, but no bowel symptoms. He denied focal weakness or changes in speech, swallowing, or breathing. His sisters brought him to the emergency room after a fall in which he hit his head on a kitchen stool, and he was admitted to the neurology service for further evaluation.

The patient's medical history included longstanding tobacco use, chronic obstructive pulmonary disease, and low back pain. In addition, 5 months before the onset of his paresthesias, he was discovered to have a macrocytic anemia that did not respond to treatment with vitamin B_{12} and folate. He was subsequently treated with periodic blood transfusions.

The general physical examination was unremarkable. On neurologic examination, the patient's mental status and cranial nerves were normal. A motor examination revealed spasticity without weakness in the legs. There was severe loss of vibratory and joint position sensation in the upper and lower extremities in a stocking-glove distribution; pain and temperature sensation were relatively spared. Reflexes were normal to brisk throughout, and there was no extensor toe sign. Finger tapping and toe tapping were mildly slowed. The Romberg sign was present. The patient's gait was slow, stiff-appearing, and ataxic, with a widened base and marked truncal instability. The constellation of lower extremity–predominant spasticity and proprioceptive defects suggested an abnormality in the region of the cervical spinal cord.

A laboratory workup on the patient's admission revealed macrocytic anemia (Table 1). The vitamin B_{12} concentration was in the upper part of the reference interval, and the concentrations of cobalamin pathway metabolites homocysteine and methylmalonic acid were within reference intervals. Despite the normal B_{12} concentration, B_{12} repletion was instituted, but symptoms did not improve. An MRI evaluation of the spinal cord excluded compression but identified abnormal T2 signal along the posterior regions of the cervical and upper thoracic cord. Nerve-conduction studies showed a mild sensory peripheral neuropathy. Further questioning revealed that the patient had worn dentures for 10 years and that family members frequently chided

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him for excessive use of denture adhesive to the extent that it sometimes accumulated at the corners of his mouth.

Table 1. Patient laboratory results.[a]

Analyte	Result	Reference interval
WBC[b]	4200/μL (4.2 × 10^9/L)	3800–9800/μL (3.8–9.8 × 10^9/L)
Hemoglobin	**9.8 g/dL (98 g/L)**	13.9–17.2 g/dL (139–172 g/L)
Hematocrit	**28.3%**	40.7–50.3%
Platelets	272 × 10^3/μL (272 × 10^9/L)	140–440 × 10^3/μL (140–440 × 10^9/L)
MCV	**113 fL**	80–97.6 fL
Vitamin B_{12}	834 pg/mL (615 pmol/L)	211–911 pg/mL (156–672 pmol/L)
Homocysteine	0.71 mg/L (5.2 mmol/L)	0.69–1.88 mg/L (5.1–13.9 mmol/L)
MMA	0.032 mg/L (0.235 mmol/L)	0.010–0.037 mg/L (0.073–0.271 mmol/L)

[a] Values in boldface are outside the reference interval.
[b] WBC, white blood cells; MCV, mean corpuscular volume; MMA, methylmalonic acid.

Questions to Consider
• What is in the differential diagnosis of a noncompressive myelopathy?
• What are some causes of macrocytic anemia?
• Could the excessive use of dental adhesive contribute to the patient's symptoms?

Final Publication and Comments

The final published version with discussion and comments from the experts will appear in the August 2011 issue of *Clinical Chemistry*. To view the case and comments online, go to http://www.clinchem.org/content/vol57/issue8 and follow the link to the Clinical Case Study and Commentaries.

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