



## CLINICAL IMAGES

## A Strange Walking Posture

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### Case Presentation

A 70-y-old man was hiking in the Slovenian Alps in summer. On the fifth day of walking in a mountain area at around 1700 m, he started to feel ill. After a few minutes, he felt that he was walking with an abnormal posture. He tried to walk standing straight using hiking poles (Figure 1). A companion noticed that he was walking leaning to the left. The patient said that he had diffuse soreness in his back that may have been caused by his heavy backpack or by fatigue. He denied headache, dyspnea, weakness, and difficulty with coordination.

His companions stopped him and encouraged him to sit on the ground while they called the emergency number 112 for help. When the local emergency medical service arrived at the site, they noted an abnormal posture while the patient was standing and walking unassisted. The patient had a normal gait, without ataxia. There were no other focal neurological signs, including difficulty with speech, motor weakness, or sensory deficits. The Glasgow Coma Score was 15. There were no visible extremity injuries other than scattered contusions. At this point, 30 min after the call, the local emergency medical service decided to transfer the patient by helicopter to a hospital in Ljubljana.

When the patient arrived at the hospital, he said that the initial feeling of illness had disappeared during the



**Figure 1.** The patient walking. Image obtained from a companion.

transport, and he felt that he could move his back better. The patient reported cardiovascular risk factors, including hypertension and elevated cholesterol levels. He had a history of a vertebrobasilar stroke 9 y before while traveling in Peru. His medical history also included Mediterranean spotted fever, hyperuricemia, nephrectomy for a benign cystic tumor, multinodular goiter, and hyperthyroidism. He had no known drug

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allergies. Since the previous stroke, the patient had been taking rosuvastatin 10 mg and aspirin 300 mg daily. His cardiology follow-up visits were normal.

On examination, the patient was alert and able to speak clearly and appropriately, both in conversation and in spontaneous speech. Vital signs were respiratory rate of 15 breaths/min, heart rate of 86 beats/min, blood pressure of 145/66 mm Hg, and axillary temperature of 36.7°C. He had full range of motion of the extremities, with normal muscle tone. Motor and sensory examination results were normal. On standing and during gait examination, he had an axial tilt to the right that made him lean to the left (Figure 1). He had no ataxia. A 12-lead electrocardiogram result was normal, and blood test results, including hematology, coagulation, and metabolic panels, were essentially normal.

A noncontrast computed tomography (CT) scan with CT angiography of the head and neck showed 2 small areas of encephalomalacia in the anterior right temporal lobe and the right cerebellum but no acute abnormalities. After 4 h at the hospital, his posture had returned to normal. No further neuroimaging (eg, MRI diffusion-weighted imaging sequence) was performed to rule out stroke as he was entirely back to baseline. After a total of 6 h of observation, he was discharged without neurologic sequelae.

What is the diagnosis? What was the differential diagnosis?

## Diagnosis

### Transient ischemic attack (TIA)

The differential diagnosis of the unusual posture, with an essentially normal screening neurologic examination result, includes left lateral pelvic tilt caused by lumbar muscular spasm; reversible acute dystonic posture related to systemic causes such as alcohol intoxication, drugs (eg, metoclopramide), infections, or metabolic causes; or a spinal movement disorder caused by demyelination, such as multiple sclerosis or transverse myelitis. The patient denied using alcohol or other drugs. No magnetic resonance imaging was performed to rule out demyelinating disease, but the short duration of the symptoms made this unlikely. The history of previous stroke, neurologic examination, and absence of acute findings on the CT scan suggest the diagnosis of TIA.

## Discussion

The patient was diagnosed with a TIA, characterized by lateropulsion with rightward axial tilt while standing or walking. This made the patient lean toward the left. Body lateropulsion can be caused by the failure of posterior or anterior circulation. Axial tilt is ipsilateral to the lesion when the caudal brainstem is involved or contralateral with the involvement of a cerebral hemisphere or the rostral brainstem. Our patient had previously had a vertebrobasilar stroke, suggesting recurrence of posterior circulation failure.

Acute ischemic strokes and TIAs have been reported in visitors to mountain areas.<sup>1-4</sup> Various etiologic factors have been suggested, such as cerebral vasoconstriction triggered by hyperventilation-induced hypocapnia related to exercise or hyperresponsiveness to hypoxia or gas emboli.<sup>2,3</sup> Acute exposure to altitude can also cause an increased prothrombotic state,<sup>4</sup> which may be worsened by dehydration and hemoconcentration.

Transient ischemic attack is associated with an increased risk of stroke. Patients with TIAs should be counseled to seek medical care as rapidly as possible.<sup>4</sup> When a patient has had a stroke, the risk of a second stroke is increased, especially during the first year after the event. A person who has previously had a TIA or stroke should not hike alone. Companions can recognize neurologic signs and call for help. Transient ischemic attacks and strokes can cause falls. Body lateropulsion is associated with a tendency to fall. The patient did not report falling, possibly because he used hiking poles for support. The use of hiking poles can improve balance, coordination, and stability, possibly reducing the risk of falls.<sup>5</sup>

Acknowledgment: Informed consent was obtained from the patient.

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