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Case Report

Hypokalemia mimicking a herniated vertebral disc

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Abstract

BACKGROUND CONTEXT: A herniated vertebral disc is a common cause of paralysis. Other causes include infections, tumors, and neurologic diseases. A rare and dangerous but in most cases easily treatable cause is hypokalemia. Clinically, the acute symptoms may resemble a herniated vertebral disc, but hypokalemia per se is life-threatening by causing heart arrest through ventricular tachycardia or fibrillation.

PURPOSE: A patient with back pain and neurologic deficit in the lower extremities after a history of a herniated vertebral disc presented, who finally receives the diagnosis of hypokalemia.

STUDY DESIGN: Case report.

METHODS: A 25-year-old female patient presenting after a fall with muscle weakness in both legs was followed clinically and radiographically.

RESULTS: Neurological examination showed a lower extremity muscle weakness with three-fifths muscular strength of the quadriceps and tibialis anterior muscle on both sides. Reflexes were diminished bilaterally, anal sphincter tone was normal. Plain radiography suggested a posterior rim fracture of L5, but computed tomography did not confirm this diagnosis. The laboratory investigation revealed a hypokalemia of 1.7 mEq/L. On electrolyte replacement, the patient recovered immediately.

CONCLUSION: This report describes a misleading diagnostic case of back pain and neurologic deficit after a trauma and sensitizes for the possible life-threatening diagnosis hypokalemia, which is rare but easily treatable.

Keywords: Hypokalemia; Herniated vertebral disc; Muscle weakness; Life-threatening

Case report

This case report presents a 25-year-old nurse who fell down a set of stairs while visiting a local restaurant. After the minor fall, the patient felt a generalized weakness in her lower extremities. She was immediately referred to the hospital, and because a traumatic spinal cord injury was suspected, she was immobilized. On admission to the hospital, the patient was awake and alert with a Glasgow Coma Scale score of 15, showing no signs of external trauma or distress. She reported an episode of lumbar pain during the preceding week in combination with pain in her legs. A lumbar herniated disc had previously been diagnosed. According to her profession, she was familiar with the clinical picture of lower back pain and weakness in the lower extremities, which she interpreted as a lumbar herniated disc.

The neurological examination showed good sensation to light touch and revealed a proximal weakness with three-fifths muscular strength for the quadriceps and tibialis anterior muscle bilaterally. Reflexes were diminished on both sides and anal sphincter tone was normal. Strength of the upper extremities was normal. During palpation, the right sacroiliacal joint and the processus spinosi of L3–L5 were painful.

FDA device/drug status: Not applicable.

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A small fracture of the posterior rim of L5 was suspected after initial radiographic examination (Fig. 1). Computed tomography of the lumbar spine (Fig. 2) did not confirm the fracture nor did it show a compression of nerve roots, a spinal stenosis, or spinal tumor.

Neurological reassessment showed muscle weakness of the upper extremities with four-fifths muscular strength for the biceps and diminished reflexes on the left side.

Laboratory tests at the time of admission revealed an elevated leukocyte count of 14.4 G/L and a decreased potassium level of 1.7 mEq/L. Blood ethanol level was 0 mg/dL and drug screening was negative. On further questioning, the patient admitted abuse of diuretic medications and benzodiazepines. Immediately, the patient was admitted to the intermediate care unit for cardiac surveillance and slowly underwent potassium replacement for 17 hours through a central venous catheter (15 mmol/h). Once the serum potassium was in normal ranges the patient was transferred to an internal ward and could be discharged the following day without further treatment.

Discussion

This report presents a rare case of hypokalemia mimicking a spinal cord compression in a young nurse with abuse of diuretic medications, who was presenting after a trauma and a history of lower back pain. Hypokalemia leads to multisystemic effects, and is an uncommon cause of exclusive extremity muscle weakness. Patients suffering from hypokalemia often present with cardial arrhythmia [1]. Muscular weakness and rhabdomyolysis also can be signs of very low serum potassium levels (<2.5 mEq/L) [2,3], yet these symptoms usually do not occur separately but are parts of a syndrome.

Hypokalemia in diuretic therapy is a common side effect, with an incidence of about 20% [4–6], but normally has a moderate extent when kept under surveillance (3.0–3.5 mEq/L). The chronic use of diuretics without compelling medical reason should be an alarming sign for a psychiatric disease [7]. Intermittent abuse of diuretics in young women (flight attendants, ballet dancers, models) or bodybuilders is not rare [8,9], but there are no data about its incidence in the literature. The gastrointestinal loss of potassium by frequent vomiting, enteral fistulas, and antibiotics should be included into the differential diagnosis [10,11].

The treatment of a severe case of hypokalemia contains parenteral substitution of potassium with a maximum intake of 20 mmol/h under monitoring conditions [12,13].

Conclusion

In this case, the patient presented with the misleading symptom of lower back pain, which is a common complaint in modern society and is especially prevalent among nursing staff [14]. The history of trauma, low back pain, and an ''already diagnosed'' lumbar herniated disc were further simulating a spinal cord injury or compression. Normally, lumbar disc hernias present with paraesthesia and muscular weakness in a radicular manner. In this case, bilateral muscular weakness was present, which may be caused by a median herniated disc, but this is relatively uncommon [15]. Although hypokalemia is a known cause of paralysis [16],

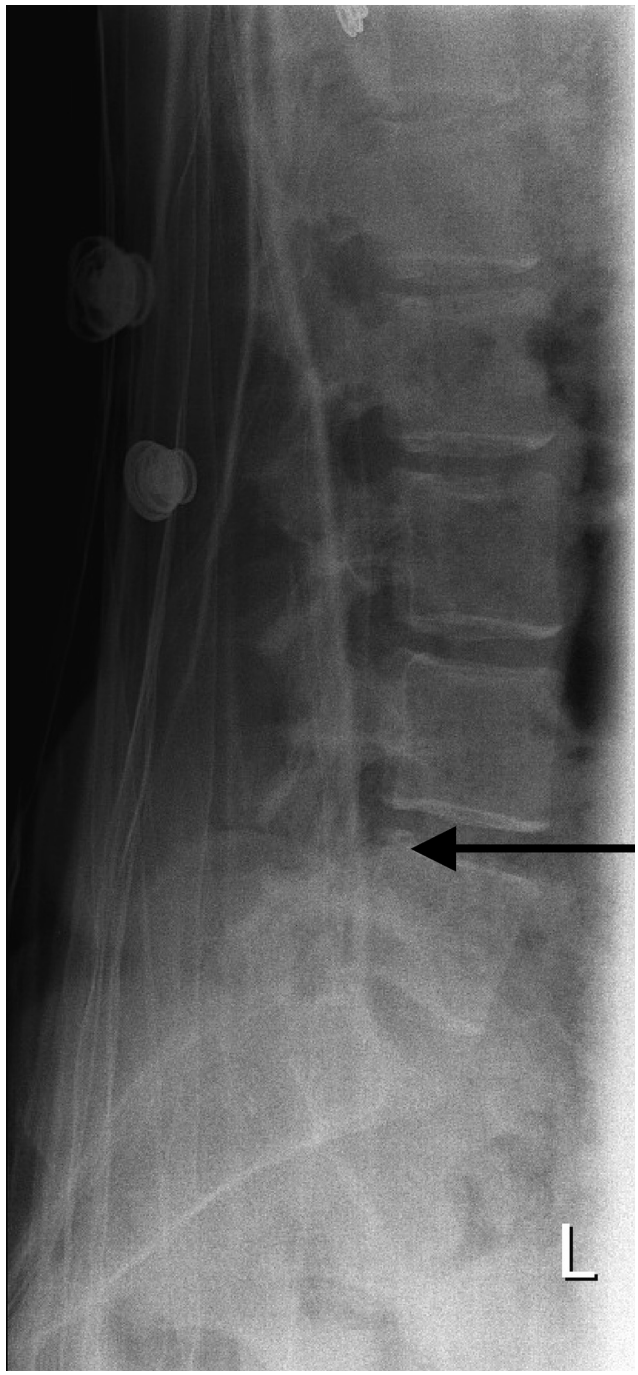

Fig. 1. Lateral view of the lumbar spine suggesting a small fracture of the posterior rim of L5 (arrow).