Case Report

The Wrong Turn to Tijuana: Dry Beriberi after Gastric Bypass Surgery with Incidental Spinal Stenosis

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Keywords

Dry beriberi · Spinal stenosis · Thiamine deficiency · Polyneuropathy · Gastric bypass

Abstract

Thiamine deficiency is a condition characterized by several different presentations, but one of the most devastating is dry beriberi. It is associated with polyneuropathy and muscle weakness which typically affects the lower extremities and progressively involves the upper extremities. This case outlines a case of a 41-year-old man that presented to the hospital with diffuse weakness and decreased sensation in his legs and hands over a 3-day period. The patient's medical history revealed a gastric bypass surgery 4 months previously in Tijuana, Mexico, with no follow-up, binge drinking on weekends, and emesis in the past few weeks. A physical examination revealed a significant decrease in strength in the lower extremities bilaterally as well as in the hands bilaterally. MRI showed central disc protrusion at T6–T7 that indented the spinal cord, consistent with spinal stenosis. Neurosurgery was counseled and corpectomy was recommended. While awaiting surgery, a low thiamine level resulted. Neurology was consulted, and it was recommended that high-dose IV thiamine treatment be started. An EMG study further supported the diagnosis of thiamine deficiency. The patient received high-dose IV thiamine for 2 weeks and was discharged to acute rehabilitation on a high oral dose of thiamine. While at the rehabilitation facility, the patient continued to achieve functional gains and was later discharged to a skilled nursing facility, where he continues to make progress in his activities of daily living. This case serves to remind practitioners that early recognition and treatment

of thiamine deficiency is imperative, especially when other clinical evidence may point to a different diagnosis.

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Introduction

Thiamine deficiency can result in many different conditions that present in different ways. Cases of dry beriberi are not as common, and unless the practitioner is familiar with the different types of presentation, this diagnosis can be missed. Polyneuropathy and diffuse muscle weakness are the most common presentations of this condition [1]. The polyneuropathy and muscle weakness often start in the lower extremities and progress over time to involve the upper extremities. Dry beriberi is not uncommon in the gastric bypass population with poor compliance to nutritional supplementation [2]. Patients who abuse alcohol or have persistent vomiting are also at a higher risk of developing this syndrome [3].

Case Description

A 41-year-old man presented to the hospital with diffuse weakness and decreased sensation in his legs and hands. He had become progressively weak over 3 days and could no longer ambulate. His symptoms had originated in his feet and progressed upwards to involve his fingers. Five days prior to admission, he had been admitted for abdominal pain and vomiting after heavy NSAID use, which had since resolved. An esophagogastroduodenoscopy at that time had shown a marginal ulcer and he had been treated with Carafate and pantoprazole. The patient had indulged in binge drinking on the weekends. Moreover, 4 months prior to admission, the patient had had a gastric bypass surgery in Tijuana, Mexico, with no follow-up. He had been prescribed a multivitamin, but he only took it intermittently. On physical examination, the patient had decreased strength (3/5 in the right lower extremity and 4/5 in the left). His finger grasp was 3/5 bilaterally. MRI showed central disc protrusion at T6–T7 with mild indentation of the spinal cord consistent with spinal stenosis, mild acquired congenital stenosis at L4–L5 (Fig. 1), and some spinal canal stenosis at C4–C7 with mild cord flattening (Fig. 2). Neurosurgery was counseled and a corpectomy was scheduled.

While awaiting surgery, the patient's symptoms continued to worsen, with decreased dorsiflexion in the right foot, inability to stand, and a decreased sensation to the mid-torso bilaterally. Neurology was consulted due to rapid progression of his symptoms. Meanwhile, the thiamine level turned out to be low at 19 µg/L (reference range 38–122). The diagnosis of thiamine deficiency was favored over myelopathy from cervical congenital canal stenosis, due to the rapidly progressive and ascending nature of the symptoms. He was started on 100 mg IV thiamine 3 times a day.

An EMG study revealed increased insertional activity in the right extensor digitorum brevis and right anterior tibialis, as well as increased spontaneous activity and an increased motor unit duration and diminished recruitment. The right vastus medialis and lateralis showed increased insertional activity and slightly increased spontaneous activity. All remaining muscles showed no evidence of electrical instability. All F wave latencies were within normal limits.

Overall, these findings suggested multifocal involvement of various degrees. Furthermore, the examination revealed axonal-dominant length-dependent neuropathy consistent with dry beriberi. The treatment with 100 mg IV 3 times a day was continued for 2 weeks with

some improvement of his symptoms. The patient was discharged to acute rehabilitation on a high oral dose of thiamine. While at the rehabilitation facility, the patient continued to achieve functional gains and improvement in his activities of daily living over the following month. He was later discharged to a skilled nursing facility, where he continued to show improvement of his symptoms and functional status.

Discussion

This case illustrates the importance of starting treatment of suspected thiamine deficiency prior to laboratory confirmation of its levels [4]. This patient had several crucial risk factors for developing dry beriberi, which include heavy chronic alcohol use, a history of gastric bypass surgery, and a recent history of persistent vomiting. The MRI findings in this case were a distraction from the classic presentation of ascending polyneuropathy and muscle weakness. This patient likely had congenital spinal stenosis without any nerve impingement on imaging. The thiamine deficiency was indistinctive, but since the patient continued to worsen and the thiamine laboratory result was still pending, the decision was made to proceed with corpectomy. Luckily, the thiamine result came before the patient was taken to the operating room. Starting aggressive treatment with IV thiamine and confirming the diagnosis by EMG was crucial to improving this patient's outcome. Earlier recognition and treatment of this patient's thiamine deficiency may have led to quicker improvement in the patient's symptoms [5]. Ultimately, the patient did respond to the treatment and achieved a certain level of independence at the rehabilitation facility.

Moreover, this case highlights the importance of recognizing patients at high risk of developing severe nutrient and vitamin deficiencies. This patient had multiple risk factors for developing this condition. One of the most important factors was his recent gastric bypass surgery in Tijuana. It is important to remember that patients who undergo gastric bypass surgery in other countries often do not receive the necessary follow-up and education about the importance of multivitamin supplementation [6]. This patient did take a multivitamin intermittently, but he was obviously not compliant with the standard-of-care dosing for supplemental vitamins.

Conclusion

This case serves as a reminder for practitioners that progressive polyneuropathy in a high-risk patient should prompt timely evaluation for thiamine deficiency. Thorough history-taking allows the identification of key risk factors for thiamine deficiency. Although physicians may think that waiting for thiamine laboratory results is appropriate when the differential is wide, initiation of treatment is crucial to a positive outcome. Therefore, early recognition of thiamine deficiency and appropriate treatment are imperative when other data and imaging may suggest a different diagnosis.

Statement of Ethics

The authors have no ethical conflicts to disclose.

Disclosure Statement

The authors declare no conflicts of interest.

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Fig. 1. MR image demonstrating central disc protrusion at T6–T7 with mild indentation of the spinal cord consistent with spinal stenosis and mild acquired congenital stenosis at L4–L5.

Fig. 2. MR image demonstrating spinal canal stenosis at C4–C7 with mild cord flattening.