Immediate Recovery of an “Ischemic Stroke” Following Treatment with Intravenous Thiamine (vitamin B1)

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Bariatric surgery for weight loss has proven to be a highly efficient solution for morbid obesity, type 2 diabetes mellitus and other related comorbidities. However, the rapid weight loss after the surgery may lead to side effects, namely, vomiting, and vitamin deficiency. Low levels of B complex vitamins may cause neurologic complications such as Wernicke-Korsakoff syndrome and peripheral neuropathy [1,2].

We describe a 59 year old man who, 9 months after bariatric restrictive surgery for weight loss (sleeve gastrectomy), was admitted with a clinical presentation of recent (twice within the previous 5 days) recurrent left-sided acute ischemic cerebral stroke.

PATIENT DESCRIPTION
A 59 year old man of North African Jewish descent was admitted to the Department of Medicine with left-sided motor sensory deficit and paresthesias and numbness in his left arm and leg, but no signs of extra-pyramidal pathological reflexes. A brain computed tomography and carotid and cerebral arteries CT angiography were normal and did not show any abnormality. Past medical history included type 2 diabetes mellitus and essential hypertension for 12 years, which were resolved following restrictive gastric bariatric surgery (sleeve gastrectomy) 9 months prior to the present admission. Since his operation he was taking multivitamins and exercised daily. Blood tests showed hemoglobin 13.6 g/dl, mean corpuscular volume 85.4 Fl, mean corpuscular hemoglobin 28.6 pg/dl, leukocytes 8340/mm³ and platelets 227,000/mm³. Vitamin B12 and folic acid levels were normal (380 pg/ml and 12.6 ng/ml respectively), thyroid hormone levels were normal (free thyroxine 1.29 ng/dl and thyroid stimulating hormone 0.083 mIU/ml), International normalized ratio was 1.37 and partial thromboplastin time 32.10 seconds. T-troponin was normal (0.001 ng/ml). Vitamin B1 level was not measured.

We suspected vitamin deficiency and immediately administered an intravenous injection of thiamine (vitamin B1 100 mg). Surprisingly, towards the end of the vitamin B1 infusion he declared that all his symptoms were gone and that he feels “great” without any motor or sensory deficits, paresthesias or numbness. We continued to treat him with intravenous vitamin B1 as well as other B complex vitamins and vitamin B12 sublingually, and folic acid. He felt perfectly well without any neurological deficit and was discharged after 1 week of hospitalization with a diagnosis of a vitamin deficiency-related neurological event mimicking acute ischemic stroke.

DISCUSSION
We describe a patient who was admitted to two different hospitals with the diagnosis of an acute neurologic vascular event [3]. We suspected that the patient suffered from post-gastrectomy Wernicke's encephalopathy due to vitamin B1 deficiency and initiated vitamin supplementation: an intravenous injection of vitamin B1, sublingual vitamin B12 and folic acid. The immediate clinical response towards the end of the vitamin B1 infusion was convincing, with disappearance of the neurological complaints.

We believe that the "neurovascular" event was caused by vitamin B1 deficiency. This syndrome has been described in patients undergoing gastric bypass surgery for weight loss who did not continue with vitamin supplementation after the operation. Most patients present with atypical neurological symptoms, which hamper rapid diagnosis [4,5].

A variety of neurological complications have been reported following weight loss surgery. These include Wernicke's syndrome, Korsakoff encephalopathy, neurologic beriberi, Guillain-Barre syndrome, and polyneuropathy [2,4,5]. These disorders usually appear in patients who suffered from vomiting in the first few months after the surgery. In many cases weakness is the primary feature, followed by hyporeflexia, numbness, and extremity pain [5]. Most of the neurologic syndromes appear 6–10 months post-surgery. However, Choi and Scarborough [4] reported an 18 year old...
female who presented 4 months post-laparoscopic Roux-en-Y gastric bypass surgery with generalized seizures and stroke, and the brain CT demonstrated a brain infarction [4].

The clinical presentation in our case indicated an acute ischemic stroke (but without any lesions documented by brain CT scan). The administration of intravenous vitamin B1 (100 mg) led to the immediate resolution of all the symptoms.

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**References**

**Capsule**

**A vitamin’s dark side in liver disease**

Too much of a good thing can be bad for the liver. Chen et al. found that mice with high levels of thiamine (vitamin B1) in their livers develop fatty liver disease, a metabolic disorder that affects one-third of adults in the United States. A protein called organic cation transporter 1 (OCT1) carries dietary thiamine into the liver. When the researchers deleted the Oct1 gene in mice or fed mice a diet low in thiamine, the mice did not develop the disease. OCT1 also carries the diabetes drug metformin into the liver, which might explain why metformin decreases symptoms of fatty liver disease: By competing with thiamine for OCT1, metformin reduces the amount of dietary thiamine that reaches the liver.

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Eitan Israeli

**Capsule**

**Reprogrammed heart cells set the pace**

Pacemakers have revolutionized the care of patients with slow or abnormal heart rhythms, but these devices can break or become infected. With these patients in mind, Hu et al. created biological pacemakers to provide temporary, hardware-free support until a damaged electronic device can be replaced. They inserted a gene for a human transcription factor into heart muscle cells. This gene reprogrammed the cells to become pacemakers – cells that emit rhythmic electrical impulses to drive the beating heart. These biological pacemaker cells restored normal heart rate in pigs with complete heart block, a problem with the heart’s electrical system.

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**Capsule**

**The latent reservoir of HIV**

HIV-infected cells linger even in the face of therapy, and this persistence, termed the latent reservoir, is a major hurdle for curing HIV. HIV integrates itself into the DNA of its host cells. Could that affect the latent reservoir? To find out, Malarelli and collaborators drew blood from five HIV patients on antiretroviral therapy and analyzed sites where HIV had inserted itself into the blood cells’ DNA. In many cases, these sites were not random; HIV often weaseled its way into genes that help cells grow and proliferate. Where HIV integrates into the host genome may thus determine the size of the latent reservoir.

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“So long as you have food in your mouth, you have solved all questions for the time being”

Franz Kafka (1883-1924), Czech writer regarded as one of the most influential authors of the 20th century. Most of his works, such as *The Metamorphosis, The Trial* and *The Castle*, are filled with the themes and archetypes of alienation, physical and psychological brutality, parent-child conflict, characters on a terrifying quest, labyrinths of bureaucracy, and mystical transformations.