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Running Complex

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1. Symptoms

"I just got the report from radiology," the doctor said over the phone. "The ultrasound shows what may be a mass on your liver. We need a CT scan to get a better look." The patient sat silent. It seemed impossible. She was 40 years old. Healthy. Fit. She ran regularly. Ate right. "What do you think this is?" she asked, her voice tight. "I really don't know," he answered. "But we'll figure it out."

The patient hung up, then walked over to her window. It all started nearly a year ago. Running suddenly began to make her feel nauseated. She would even throw up. It didn't happen all the time, but often enough. Then, once or twice a week she would get odd spells when she felt weak and shaky and would have to sit down. Her friends told her to see her doctor, but she didn't feel that sick.

That changed over Labor Day weekend. She was on a hike with a friend, and she started feeling sick. She vomited several times but refused to turn back. At the top she rested and started to feel better. She began the descent with trepidation, but felt fine on the way down. She knew she wasn't pregnant. What was going on, she wondered?

It was late September before she found herself in the office of her internist, Dr. Jeffrey P. Friedman. After hearing her litany of symptoms, the physician examined her carefully. She was tall and thin, with the build of an athlete. Her blood pressure was normal, her heart slow and regular. Her abdomen showed no tenderness. In fact, her exam was normal. An EKG showed no evidence of heart disease.

Confronted with these mysterious complaints, Friedman did what he always did, what he was trained to do: simplify the symptoms and think broadly about causes. What were the most common reasons for persistent nausea? Liver disease, certainly. Did she have hepatitis? Gallstones? Nausea could be symptoms of either one. Kidney disease was also possible. Abnormal blood chemistry could do this, too. Much less common, failure of the tiny glands on top of the kidneys - the adrenals - could cause nausea. And that might explain the link to exercise: these tiny glands make adrenaline and other hormones needed at times of physical stress.

2. Investigation

The doctor quickly put together his plan. First, he wanted blood tests to check her liver and kidney functions. He also wanted to measure the amount of cortisol, a stress hormone, in her blood to make sure her adrenals were working. Then she would need an ultrasound of her abdomen to look for gallstones. Once he got those results, he would have a much better idea of what she might have.

The results of the blood work came back a few days later. Everything was normal except her blood sugar - which was high enough to suggest a diagnosis of diabetes. But she had no family history, she was thin, she exercised all the time - she certainly didn't fit the profile. It was probably a lab error, he told her, and they needed to repeat the test.

The second blood test was abnormal, too. So was the third. Did she have diabetes? He referred her to an endocrinologist. Maybe the specialist could figure this out. The ultrasound - the other test that Friedman had initially ordered - was forgotten in the concern about the patient's blood sugar.

Dr. Stephen Richardson, an endocrinologist at N.Y.U., specialized in the treatment of diabetes. And while this patient was not a typical candidate for the disease, he knew that diabetics could come in all shapes and sizes. So after taking a careful history and repeating the physical exam, he recommended that she check her blood sugar regularly, adhere to a diabetic diet and increase her exercise. (She had cut back on working out since feeling sick.) Just doing that might get her blood sugars back in line, he told her.

She followed his directions. The nausea improved, as did the weak spells, but her sugars were elevated whenever she checked. She redoubled her efforts: she lost weight, hired a personal trainer. "I was in better shape than I had ever been," she told me later. Despite her efforts, her sugars remained high and she developed a troubling new symptom: throughout the day and night her heart would begin pounding hard and fast. Sometimes she would wake up, her heart beating as if she were running a race. "I thought I was having a heart attack," she said.

When she returned to the endocrinologist's office, he was concerned enough about her sugar levels to recommend starting her on a diabetes medicine. It's an effective medication, he told her, but can affect the way the liver functions. She started the drug, and her sugars improved immediately.

After a couple of months, Richardson sent her to the lab to get blood work to check her liver. When the test came back abnormal, he told her to stop the medicine, and after a couple of weeks he repeated the test. Still abnormal. Diabetes itself can cause liver damage, so the endocrinologist sent her for an ultrasound to get a better look. That's when the mass was spotted.

The ultrasound report took the endocrinologist by surprise. Diabetes can affect the liver - but not like this. He called Friedman. There's something else going on here, he told him.

It's not diabetes. That's when Friedman, the internist, called the patient about the mass that appeared in the ultrasound. Was it cancer, she asked? Friedman couldn't answer that. That was why they needed the CT scan.

The patient could barely sleep in the days before the test. She was wakened constantly by her heart's wild beating; she attributed it to nerves. As she waited for the scans in the radiology suite, she felt certain that they would hold the answer. Despite the ultrasound, she couldn't believe it was cancer. She just felt too good.

3. Resolution

When Friedman got the results of the CT scan, it was his turn to be surprised. There was a mass - but it wasn't in the liver. It was just behind it, on top of the right kidney, in the adrenal gland. Normally the size of a thumb, the gland was now nearly the size of a tennis ball - distorted by a huge tumor. The adrenal gland is a tiny factory that produces many of the hormones essential to make the body function. Most important are the hormones that manage the body's response to stress - adrenaline and cortisol. Tumors like the one seen in the CT scan could be benign - an overgrowth of tissue, often producing too much hormone. Or they could be malignant, capable of spreading through the body. Adrenal carcinoma is rare but deadly. He immediately called the patient. "This diagnosis is going to be a true team effort," he told her. The endocrinologist would help identify what type of tumor it was. Then the surgeon would take it out.

The patient had the operation soon after. And the pathologist had the last word in the diagnosis: it was a benign pheochromocytoma - an adrenaline-producing tumor. The patient's spells of palpitations, her diabetic symptoms and her nausea were due to an overproduction of the fight-or-flight hormone, adrenaline.

I spoke with the patient recently. It has been more than two years since her operation and she feels great. The blood-sugar problem is gone, as are the insomnia and palpitations. In thinking back over her experience, she says that all in all she was pretty fortunate. "I've heard that many times these things are diagnosed by accident. I feel lucky."

Friedman said this case surprised him from beginning to end. But, he added, even though he never considered a tumor, if he had followed his original plan, she would have had an ultrasound right off the bat, and they might have caught this earlier. Still, he's philosophical about the missed diagnosis. "I was taught that when you hear hoofbeats you think about horses, not zebras. But every now and then you hear hoofbeats and it turns out the circus is in town."

Lisa Sanders is the author of "The Perfect Fit Diet," to be published next month in paperback.