



Well known as vectors of malaria, tropical mosquitoes can also transmit other insidious pathogens.

A past infection haunts a woman's health. **By Claire Panosian Dunavan**

Sela Miller was perplexed—and so was I. She had just emerged from our clinic restroom, specimen in hand. But her urine was far from the bright yellow most people produce.

"So this is what it looks like," she said, staring at the milky sample. "For weeks I thought something was wrong, but I couldn't tell for sure." Then Sela, a Polynesian woman with long, dark hair—the wife of a custom car builder and mother of several youngsters—gave a tiny shrug as if to say, Oh, well.

For a moment I remained quiet. Like Sela, I had never seen anything quite like the opalescent urine now sitting in a sterile screw-top jar on my desk.

Sometimes doctors are secretly grateful when patients underreact. Over my years of practice, specializing in tropical medicine, I had certainly seen patients at the other end of the spectrum. Creative people with fertile imaginations seemed especially prone to panic. Sela—her sci-fi urine notwithstanding—was different.

And so I focused on the job ahead. "I'll walk this to the lab," I said, holding the jar in one hand while reaching for a requisition slip with my other.

Examined under a microscope lens, the fluid teemed with microorganisms and both

white and red blood cells. That gave me one diagnosis, anyway: In addition to strange, milky-white urine, my new patient had a routine bacterial infection. Back in the exam room, where she stood ready to leave, I quickly wrote a prescription for antibiotics.

A day later, Sela's urine culture had grown a garden-variety strain of *E. coli*, the single most common cause of urinary tract infections the world over. Good, I thought. The sulfa drug would make quick work of that.

However, I had asked the lab to perform additional urine assays, including protein, cholesterol, and triglycerides.

"Wow!" the tech exclaimed. "Now here's something we almost never see. Her sample is loaded with fat."

That gave me a second diagnosis—of sorts. The finding suggested that my patient's milky urine was not just infected but also laced with lipid-rich lymphatic fluid. In medical-ese, the condition is called chyluria. From a purely anatomic standpoint, chyluria represents a fistula, or microscopic leak, between lymphatic vessels and the kidney.

The fancy name still left unanswered the most important question: What underlying process had led to the breach in the first place? My patient was not likely to have kidney cancer or tuberculosis,

two diseases that occasionally cause chyluria. Had some toxic chemical in her husband's car barn silently damaged her kidneys? Or, as her primary-care doctor had casually asked when he referred her to me, was a parasite involved? If so, the likely culprit was *Wuchereria bancrofti*, a slender nematode transmitted by tropical mosquitoes. Adult worms of *Wuchereria bancrofti* are famous for damming up lymphatic vessels. If they settle near the kidneys, obstruction and backflow within the delicate lymph vessels nearby can, over time, cause ruptures and spills of lymphatic fluid into adjacent drainage structures of the human urinary tract.

Wuchereria bancrofti can inflict still more harm upon its human hosts. In some cases, the threadlike worms—which measure several inches in length when fully grown—damage even larger lymphatic channels. When this happens victims may eventually develop elephantiasis—grotesquely swollen limbs and genitalia encased in thick, pebbly skin.

Picture yourself in a mosquito-ridden enclave with an early case of elephantiasis in, say, a lower extremity. Over years, periodic nicks and cuts leading to superficial skin infections—the everyday stuff of tropical poverty—compound the internal lymphatic

damage caused by the adult worms. Meanwhile, tiny bloodborne larval offspring transmit the infection to new mosquitoes.

"Hey, aren't you getting ahead of yourself?" I suddenly wondered. My patient was a middle-class housewife, not a tropical villager, and aside from chyluria she had no sign of damaged lymphatics. I wasn't even sure if *Wuchereria bancrofti* existed in her Polynesian birthplace.

At her next appointment, Sela patiently answered my questions one by one. Yes, her husband used many paints and chemicals in his custom car business, but she was rarely at his shop. No, to her knowledge she had never been exposed to tuberculosis. As for encountering a tropical parasite, who knew? Until age 10, she had lived in the South Pacific, returning for periodic visits until she married.

When I pressed her for details about ailments where she grew up, she nodded. From her childhood she vaguely remembered stories of people with disfigured body parts. A woman with a leg as thick as

PICTURE YOURSELF IN A MOSQUITO-RIDDEN ENCLAVE WITH AN EARLY CASE OF ELEPHANTIASIS.

a palm tree. A man whose massive, warty foot had required a homemade rubber sandal. An aged neighbor whose flapping cotton shorts were rumored to hide an unusually large scrotum.

Finally, she dropped the clue that cracked her case. A few years earlier, after Sela gave birth, a lab tech in another hospital had spied tiny larval worms in her blood. Sela then took a special drug whose name she could no longer recall. But that was long before the weird pee began, she quickly added.

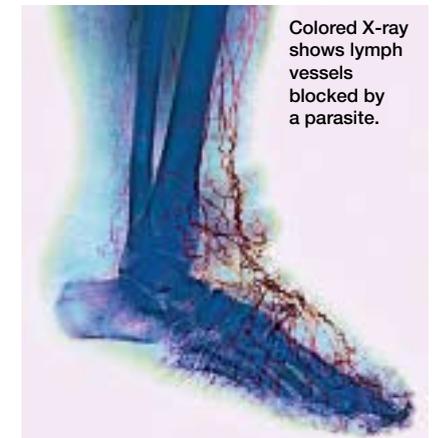
I was dumbfounded. Had this bright, capable woman—juggling family, work, and other demands—simply forgotten her prior diagnosis? Failed to connect the dots between her earlier treatment and her new milky urine? Or, I wondered, briefly playing amateur psychologist, had she deliberately avoided the thought that she, too, might one day develop elephantiasis?

I never explored those questions. She's just plain lucky that this is the only problem I found, I finally told myself, and decided to leave it at that.

My patient remained lucky. On the suspicion that she might still harbor live worms, I prescribed for her an old-fashioned medicine called diethylcarbamazine. Within a week or two, her abnormal urine abruptly stopped: Her hidden fistula had healed. Whether diethylcarbamazine or the earlier course of antibiotics was responsible, I'll never know for sure. Chyluria resulting from progressive lymphatic damage can crop up well after an active filarial infection has burned out. In any event, I was relieved. If Sela had come to me with a more ominous harbinger of elephantiasis—say, a mildly swollen leg—it is doubtful that any drug would have reversed the problem.

Fast-forward five years. Once again Sela battled Los Angeles traffic and met me in the room where we had first stared at her milky urine. She couldn't remember the last time she had seen a doctor. As we talked, she admitted that her calves sometimes hurt and her skin felt flaky and dry. These were normal complaints, it seemed to me, for a busy homemaker with little time to prop up her feet at the end of the day or pamper herself with lotion. Of course, just to make sure, I asked Sela if there had been any problems with her urine. Still yellow, she replied.

Again I wondered if Sela truly grasped the physical horror that might have befallen her. Then I thought: "Oh, heck, why add one more worry? Life already has more than enough." ■



Colored X-ray shows lymph vessels blocked by a parasite.

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