

Lasering leg pain away

A new treatment for peripheral artery disease restores circulation

By Teri Greene
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If Jessie Norris took a walk, he'd have to stop every 40 to 50 yards. The pain in his legs was just too much.

"I didn't know what was going on," said Norris, 54, of Kellyton. "My legs had been hurting for quite awhile. I wanted that pain to go away."

He tried over-the-counter medications, but to no avail. He attributed the leg pain to his back, on which he'd had surgery years before.

What he did not know was that he was suffering from peripheral artery disease (PAD), a condition in which the arteries in the legs become blocked, preventing adequate blood flow and often resulting in foot ulcers, gangrene and, in its most severe stages, amputation of the leg.

Fortunately, Norris ended up in the office of Dr. Bassel Refai, a vascular interventionist at Russell Medical Center in Alexander City. That's when he received the correct diagnosis — PAD, with three blockages in his right leg and one in his left.

Finding blockages

At one time, a diagnosis of peripheral artery disease inevitably meant amputation of the affected limb. But Refai is one of a growing number of specialists to use a cutting-edge procedure called excimer laser ablation that is increasingly saving limbs.

Refai said PAD, which affects about 8 million Americans, is often left untreated because its symptoms are sometimes mistaken for those of "old age."

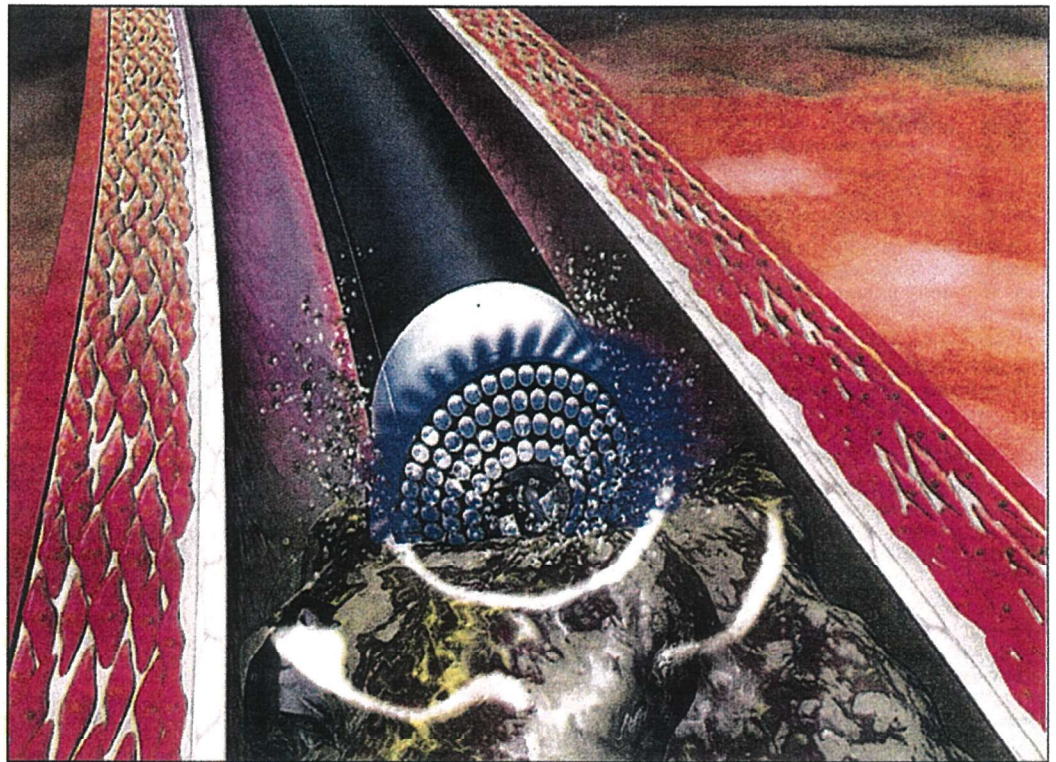
"The older you are, the more likely you are to get it. It has been accepted that it's OK for your legs to hurt as you age. A lot of doctors blow it off," Refai said of PAD. "This is an issue of supply and demand."

"When you walk, you demand more blood go to your legs. This is not just pain," he explained. "If a patient says, 'When I walk my leg gives on me,' or 'When I climb stairs I have to stop half way,' this is a classic claudication indicator."

Claudication is the pain that develops in the legs' muscles during exercise, he said. That pain indicates that there is a blockage in the leg due to plaque buildup, meaning the muscles are not getting adequate blood. With every stenosis, narrowing of the artery, the pressure in that vessel continues dropping until it is not able to push blood down the leg at all.

This results in gangrene and ulcers in the toes. The skin breaks down, or it gets infected.

PAD is a "multi-level disease," Refai said. By the time patients end up in the hospital, they have developed blockages in more than two leg zones, in the pelvis, thigh and calf, for example. Critical limb ischemia, or CLI, is the most severe form of PAD and affects about 1 million people in the U.S.



Contributed

Excimer laser ablation uses ultraviolet light to destroy portions of artery-clogging plaque, allowing blood to flow freely. The technique offers a less invasive option than a bypass or, in extreme cases, amputation.

"The sad part is that those patients are the ones who lose their limbs," Refai said.

The encouraging part is that when a patient receives an earlier diagnosis (before three leg zones are affected), that patient stands a better chance than ever of avoiding amputation.

To determine whether PAD is present, Refai measures a patient's ankle brachial pressure index, the ratio of the blood pressure in the lower legs to the blood pressure in the arms.

"They should be equal," Refai said of the pressure in the legs and arms. "If not, the person has a problem."

Breaking it down

In the past, the treatment options for severe PAD were bypass surgery, balloon angioplasty and in the most severe cases, amputation. More than 100,000 foot, toe or leg amputations result each year from the disease, according to Spectranetics, a technology company at the forefront of excimer laser ablation.

The technology of the excimer laser was available, but before special dyes were developed to pinpoint the location of blockages, there was a major problem using it effectively, Refai said.

Now, he said, "We have been having very, very good results."

The excimer laser uses kinetic energy to crack the old blockage in the leg and, simultaneously, uses vaporizing energy in the form of ultraviolet light to burn and vaporize cells, breaking the blockage into

WHAT IS PERIPHERAL ARTERY DISEASE?

Symptoms of severe PAD include leg pain that doesn't go away when you stop exercising; foot or toe wounds that won't heal or heal very slowly; gangrene; and a marked decrease in the temperature of your lower leg or foot particularly compared to the other leg or to the rest of your body.

Understanding leg pain

Many people dismiss leg pain as a normal sign of aging. You may think it's arthritis or sciatica or just "stiffness" from getting older. PAD leg pain occurs in the muscles, not the joints. Those with diabetes might confuse PAD pain with neuropathy, a burning or painful discomfort of the feet or thighs, a common symptom among diabetics.

If you're having any kind of recurring pain, talk to your health-care professional and describe the pain as accurately as you can. If you have any of the risk factors for PAD, you should ask your health-care professional about PAD even if you aren't having symptoms.

PAD quick facts

- The most common symptoms of PAD are cramping, pain or tiredness in the leg or hip muscles while walking or climbing stairs. Typically, this pain goes away with rest and returns when you walk again.

- Many people mistake the symptoms of PAD for something else.

- PAD often goes undiagnosed by health-care professionals.

- People with PAD are at higher risk for heart attack and stroke.

- People with high blood pressure or high cholesterol are at risk for PAD.

- PAD is easily diagnosed in a simple, painless way.

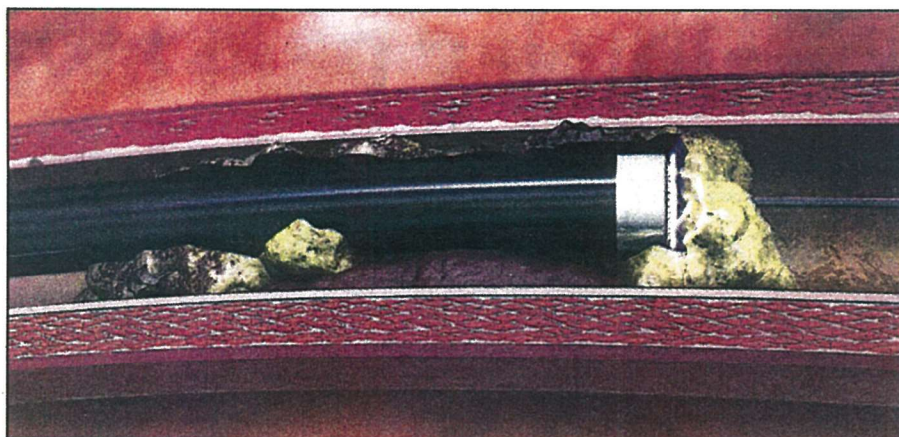
- You can take control by leading a heart-healthy lifestyle and following the recommendations of your health-care professional.

- Left untreated, PAD can lead to gangrene or amputation.

- If you smoke or have diabetes, you have an especially high risk for PAD.

- Most cases of PAD can be managed with lifestyle changes and medication.

— Source: The American Heart Association



Spectranetics

A diagram from Spectranetics shows how the laser catheter moves slowly through the blockage, one millimeter per second, vaporizing the blockage. The laser light breaks down the blockages into byproducts easily absorbed by the bloodstream.

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tiny particles and creating a tunnel through which blood can once again flow.

The laser, delivered into the artery through a catheter, aims to remodel the vessel from the inside.

"It is using kinetic energy and trying to crack the old blockage, and at the same time use vaporizing energy to burn and vaporize the cells. It breaks the blockage into tiny particles that don't affect limbs and creates a tunnel," Refai said.

You could visualize the process as a fire burning its way through a pipe filled with junk, he said. That's oversimplifying the procedure, but essentially it's what happens. The pipes in this case are the blocked arteries, "junky vessels."

The "bubble" created by the laser does not go beyond the vessel.

"We are merely working inside the pipe, which is the vessel itself," he said.

Refai said arterial disease is segmented or "patchy." You could have a severely blocked area of the artery in the thigh, even though the area in the calf is clear. The process essentially takes a completely blocked area and creates a partially connected area, then connects the partially healthy area to healthy areas.

Patients are usually up and walking within three days, he said. The durability of the procedure varies — the shorter the segment of artery that is treated, the longer it will probably last. The reverse is also true.

"The key is a six-month period that gives the artery a chance to heal," he said of patients who have received excimer laser ablation. "When they start walking, they are able to provide more blood flow down to the leg."

The procedure can be repeated, and often is.

UNDERSTANDING LASER TECHNOLOGY

LASER is an acronym for Light Amplification by Stimulated Emission of Radiation.

The laser is a focused beam of light caused by exciting atoms to a high energy level. The laser light delivered depends on the gases and other factors used to create the energy levels. This determines the medium of the light spectrum used — the resulting beam of light emitted can be ultraviolet, visible or infrared regions of the spectrum.

Scientists of the 1900s discovered laser, but technology tests did not begin until the 1950s and '60s. In the mid-'80s engineers discovered that using concentrated ultraviolet light delivered from the laser

in short, controlled energy pulses from fiber-optic delivery devices could be a valuable medical treatment to remove build-up of arterial disease within the body.

The Spectranetics system, the system used by Dr. Bassel Refai of Russell Medical Center, is an excimer laser. It utilizes a wavelength of 308 nanometers in the ultraviolet region of the light spectrum. The laser dissolves arterial plaque without harming healthy tissue. Excimer laser ablation has been shown to vaporize the obstruction in a way that is far safer and simpler than those previously used.

— Source: Spectranetics (www.spectranetics.com)

PAD: Spreading the word

For now, after excimer laser ablation, Jessie Norris's pain is gone.

"Oh yes," he said when asked if he's back to an active life. "My legs don't bother me anymore."

At least not his right one. But his left one is beginning to ache a little, once again.

"We buy them time," Refai said of patients who, like Norris, are diagnosed at later stages of the disease. "After a year they may have another ulcer and then they come back."

As the technology has advanced to treat PAD, many physicians have become better at diagnosing it in time for effective treatment, Refai said.

But not all of them. Refai is on a mission to alert other doctors, and the general public, about the importance of screening for PAD. He said lifestyle factors in prominently when it comes to PAD, so cases could even be prevented through behavioral changes.

"If someone is 40 to 50 and is a smoker, uncontrolled diabetes, and probably their cholesterol is high. I have seen people in their 30s, who have PAD. Those ulti-

mately end up, in their 50s, losing their limbs. You can buy them time only so long.

"We are trying to spread the word that this is something serious," he said. "They can't ignore it and let it go."