Surgery Shows Promise For Treatment of Diabetes

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Rocco Turso was injecting himself with insulin three times a day, swallowing pills twice daily and restricting his diet. But his diabetes was still out of control, blurring his vision, making his feet numb and sapping his energy. So he decided to try an experimental operation. Within days, his blood sugar was normal and he was off all his medications.

"It's been truly amazing," said Turso, 62, a construction superintendent from Harrison, N.Y. "I use the word 'miracle.' The diabetes was killing me. It's given me back my life."

Turso is one of a handful of Americans who have undergone a novel procedure that proponents say appears to offer the most important advance since the discovery of insulin in treating one of the most common chronic diseases.

"It's extremely promising," said Madhu Rangraj, chief of laparoscopic surgery at the Sound Shore Medical Center in New Rochelle, N.Y., who performed the operation bypassing part of Turso's small intestine in March. "It's a surgical solution to diabetes."

While many surgeons share Rangraj's enthusiasm, and some diabetes experts agree that the operation and similar ones may lead to fundamental new insights into the disease, other experts remain cautious. Much more research is needed, they say, to validate the effectiveness of the procedures. They worry that the operations will start to proliferate before their long-term safety and effectiveness have been proven, as often occurs with novel surgeries.

"I'm skeptical," said R. Paul Robertson, president-elect of the American Diabetes Association. "It bothers me to see this message being put out there that we can now cure diabetes through surgery. They have to prove that to me."

Turso's operation is a variation of a procedure developed to treat severe obesity. Known as bariatric surgery or gastric bypass, the standard operations reduce the size of the stomach and bypass part of the intestine. That limits the amount of food a person can eat and the calories that can be absorbed. The procedures have soared in popularity as the obesity epidemic has spread and clinical trials have validated their safety and effectiveness.

Although doctors have long known that losing weight can alleviate Type 2 diabetes, the most common form of the disease, they were surprised to discover that many patients saw their blood sugar return to normal remarkably quickly after the operations, often within days -- and before they had lost much weight.

"There's something significant that's happening as a result of this surgery that we haven't yet identified,"
said Neil E. Hutcher, a Richmond surgeon and senior past president of the American Society for Metabolic and Bariatric Surgery. "I think it's the most significant advance in the management of this chronic killing disease since the discovery of insulin."

In dozens of studies involving thousands of patients, standard gastric bypass surgery cleared up diabetes in more than 80 percent of obese patients who had the disease, raising the possibility that surgery would help those who weigh less. Currently, the procedures are recommended only for those who are severely or moderately obese and have diabetes or other serious complications. But surgeons have started testing the operations on patients who are less obese, just overweight or even at normal weight.

"By operating on patients with lower body mass, the focus dramatically shifts from being a weight-loss procedure to being a diabetes-specific procedure," said Philip R. Schauer, a bariatric surgeon at the Cleveland Clinic, who is comparing a standard procedure with drug treatment for diabetes in patients whose weight puts them below the current criteria for the surgery. "This treatment can essentially put a high percentage of patients into remission. It also improves their cholesterol and blood pressure. Those three things are key for diabetics to avoid complications."

How the operations alleviate diabetes remains mysterious. But researchers suspect that they alter the elixir of hormones secreted by the digestive system to regulate hunger, store energy and influence other physiological functions, helping restore the body's system for controlling blood sugar with insulin. One possibility is that they increase production of an insulin-boosting hormone known as GLP-1.

A key clue came from Francesco Rubino, an Italian surgeon who conducted a series of experiments in diabetic rats. When he bypassed parts of their upper intestines, leaving their stomachs intact, the animals' diabetes disappeared. When he reversed the operation, the disease returned.

"That was seen as the first demonstration that there is an anti-diabetic effect that is intrinsic with the change in anatomy induced by the surgery," said Rubino, who recently moved to New York Presbyterian Hospital/Weill Cornell Medical Center to open a diabetes surgery center.

He has launched another study comparing standard bariatric surgery with medical diabetes treatment for those with lower body weights. A similar trial is underway at the University of Minnesota.

"It's one of the most exciting times in medicine," said Rubino, who is organizing an international meeting in New York in September to try to build consensus on the role of the procedures in treating diabetes. "For the first time in diabetes history we have a concrete chance to create a major shift in treatment goals: from improving life with diabetes toward the hope of a life without it."

Rubino's experiments and the intriguing results with standard bariatric surgery have prompted surgeons in several countries to try the modified stomach-sparing operation in people who are not obese and sometimes not even overweight.

"It's fantastic," said Ricardo V. Cohen, director of the Baros Institute for Metabolic and Bariatric Surgery in Sao Paulo, Brazil, who has had the most experience with the laparoscopic procedure. Cohen said he has operated on about 65 diabetic patients who were not obese, producing full remission in 65 percent and partial remission in an additional 12 percent. "This is a paradigm shift in treating leaner diabetic patients," he said.

Surgeons in several other countries, including Japan, Mexico and India, have also been testing the technique. In the United States, Rangraj has operated on five patients, including Turso, and plans at least
five more surgeries to evaluate the procedure’s effectiveness.

"We're focusing on patients with diabetes that is way out of control," Rangraj said. "So far, all of our patients have been absolutely thrilled."

Rubino is also planning to study the stomach-sparing procedure in leaner diabetics, and surgeons at the Tufts Medical Center in Boston are beginning a trial comparing it with standard medical care. They expressed concern, however, about the operations being done outside careful clinical studies.

"I'm a little nervous that as more people find out about what's being done, that every Tom, Dick and Harry surgeon is going to do this, and every patient will come out of the woodwork asking for it," said Michael E. Tarnoff, an associate professor of surgery at the Tufts University School of Medicine. "I don't think it's ready for prime time. It's ready for cautious, well-controlled trials."

While acknowledging that the procedures show promise, several diabetes experts agreed that much more research is needed to validate the operations. Diabetes can, for example, go into temporary remission when patients sharply reduce their food intake, which frequently occurs after surgery on the digestive system, they noted.

"Clearly, more work needs to be done before everyone rushes to bariatric surgery to get their diabetes fixed," said Myrlene Staten of the National Institute of Diabetes and Digestive and Kidney Diseases, which is soliciting proposals to study how the operations affect diabetes.

It also remains unclear whether the benefits outweigh the risks of short-term complications that come with any surgery, the costs -- about $25,000 -- and the possibility of long-term problems, such as nutritional deficiencies.

"These are potentially dangerous procedures," said David M. Nathan, a professor at Harvard Medical School. "Where do you draw the line? Do you do people who are slightly overweight? Thinking about this as just a way to treat diabetes doesn't make sense. We have lots of ways to treat diabetes. There's always that slippery slope where you start opening the door for one thing and people start using it for another. We live in that kind of culture."

Proponents agreed that the procedures should not become routine until they have been studied further. But several noted that bariatric surgery is now as safe as many other common operations, such as hip surgeries, heart bypasses and hysterectomies. And there is mounting evidence that the benefits are long-lasting, they said.

"The notion that a surgical procedure may be extremely effective and provide a virtual cure for diabetes is very foreign to how diabetes has been treated for 100 years," said Schauer, the Cleveland surgeon. "Diabetes is the quintessential medical disease. It's been treated by shots and pills for 100 years. The idea of surgery sweeping in and rendering 80 percent of patients with a virtual cure is a very radical concept."

Not all diabetes specialists are skeptical.

"We're on the threshold of something big here," said David E. Cummings, an associate director of the Diabetes Endocrinology Research Center at the University of Washington. But Cummings and others hope researchers will figure out how the operations work so they can develop drugs to mimic the effects.
"Understanding what is happening -- what the reworking of the intestinal tract is doing to diabetes -- is the holy grail," said David R. Flum, a professor of surgery and public health at the University of Washington. "Surgery in a pill is where this all needs to be headed."

Turso and other patients who have undergone the procedure say they have no regrets.

"I feel wonderful," said Melba Morales, 54, a social worker from the Bronx who had the operation in November. "Before this, I had a pharmacy in my house. Now I don't have to think about my medication. I never thought that would happen."

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