

New procedure 'rewires' the heart to prevent recurrent fainting spells

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A procedure conducted for the first time in the United States at University of Chicago Medicine has provided much-needed relief for a patient who suffered from recurrent fainting spells.

Called cardioneural ablation, the procedure essentially rewired the [heart](#) to treat the recurring sudden drops in [heart rate](#) and blood pressure that had been causing the 52-year-old woman to faint at least once every two months for most of her life.

This type of ablation, performed by Roderick Tung, MD, an internationally known expert on advanced therapies for [heart rhythm disorders](#), had been performed in Europe, South America, and Asia but not in the U.S. But Tung and his team wanted to help give the patient the relief she could not find with other therapies.

Since having the ablation a year and a half ago, the woman has not fainted, even in situations where she would normally faint, such as having her blood drawn.

"We have been following the data from other countries very carefully, and it's really exciting," said Tung, Director of Cardiac Electrophysiology at UChicago Medicine. "Now we have shown for the first time in the United States that this could be a viable [therapy](#) for patients who haven't responded to other treatments."

A case report about the patient and the procedure was published June 10 in *JACC Case Reports*.

The woman initially came to Tung because she had suffered from what is called vasovagal syncope for most of her life. The condition causes people to faint when certain triggers, like the sight of blood, cause their heart rate and blood pressure to drop suddenly and reduce blood flow to the brain.

The woman had tried several therapies to treat the condition, including medications and a dual-chamber pacemaker, but nothing seemed to work. She had read about cardioneural ablation therapy and approached

Tung to see if he and his team would consider the procedure.

Tung is an expert on cardiac ablation, a minimally invasive procedure in which a catheter is threaded into the heart and heat is used to destroy tissue to restore correct heart rhythms. But physicians in other countries had shown that using the same technique to target ganglionated plexi (GP), clusters of neurons in the heart, had provided relief to those suffering from vasovagal syncope.

Tung agreed to the procedure on a compassionate-need basis as he had followed the evolving field through international publications. "We wanted to see if this was feasible as a treatment in desperate situations," he said.

There is no agreement on just how to use ablation to target GP, however; the neurons are located within the heart in a complex network. Tung and his team used high-frequency stimulation in the left upper chamber of the patient's heart to find areas that had the most nerves that slowed down the heart's rhythm. They then used cardiac [ablation](#) techniques to target three of those areas to remove the response. When they stimulated those areas after the procedure, they found that they no longer slowed the heart's rhythm.

"We are rewiring the heart to get rid of the excessive autonomic tone that slows heart rhythms and slows [blood pressure](#), culminating in simple fainting," Tung said. "There is a yin and yang of autonomic tone in the heart, and too much of the slowing that counterbalances adrenaline responses leads to simple faints. To date, there are no established therapies for this frustrating condition, except behavioral modification."

A month after the procedure, the patient returned to undergo a tilt-table test, where a person lies on a table and is then is tilted up to stimulate the reflex that can cause fainting. The patient had undergone the test before

the procedure and had fainted, but after the procedure, she did not faint, and when the test was performed again a year later, she still didn't faint. In fact, she hasn't had any fainting episodes since the procedure was performed.

Tung cautions that the procedure is not for everyone, and that much more research is needed before it is considered for standard clinical practice. He hopes to perform a controlled study in the future using patients who have not had success with other therapies.

"We want to make sure this procedure is safe and feasible, and we definitely do not recommend this for everyone who has had recurrent faints," he said. "It is a very specific physiologic response that we are looking for, but we are quite encouraged with this result. It may signal a paradigm shift in the way we think about rewiring the balance of nerves that regulate the heart."

Provided by University of Chicago Medical Center

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