INTERVENTIONAL CARDIOLOGY TODAY

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More PE Patients Saved Quickly with Catheter-Based Techniques

Treatment for pulmonary embolism (PE) is catching up to the ways that specialists intervene with other deadly thrombotic conditions such as stroke and heart attack. Catheter-based mechanical removal of PEs is taking center stage and proving enormously beneficial to patients with moderate to severe PE events.

Affecting close to a million Americans per year, PE has had stubbornly high death rates, in contrast to gains against other causes of cardiovascular mortality. One of the most common causes of death worldwide, PE has demanded innovation and raised the need for more direct intervention.

"Too many people with PE die before they can be treated," said Virtua interventional cardiologist Rita Butler, MD. "The field is trying to change that by updating and formalizing treatment guidelines and response structure—and by offering faster, more-complete resolution, in large part through direct, minimally invasive treatment of emboli."

New Tools for Rapid Response Team

Virtua has led the introduction and use of Inari Medical's FlowTriever® device over the last several years. Advanced via femoral catheter, FlowTriever accesses the pulmonary artery to capture and withdraw PEs. As a tool of the Virtua Pulmonary Embolism Response Team (PERT), it has altered the care and experience of patients with dangerous PEs.

The procedure, performed in the cardiac catheterization or interventional radiology lab, typically brings patients near-immediate relief. Within minutes, they may regain enough breathing ability to speak full sentences again. And, their stay in the hospital is a fraction of that for gradual IV anticoagulant therapy.

"When we get a call from an ER or ICU, or a hospitalist, PERT ensures that the referring specialist is immediately in conversation with both a pulmonologist and either an interventional cardiologist or radiologist," explained Dr. Butler. "We can then determine if the case is acute enough to call for immediate tPA administration, or amenable to catheter extraction or catheter lysis of the clot—or can be approached with even more-conservative means."

Preventing Long-Term Damage or Lingering Risk

Deep vein thrombosis is often the source of the PE, for which speed is important in limiting damage to the lung and right ventricle. The team judges acuity and risk through embolism size and position, and cardiovascular dynamics such as right ventricular (RV) strain.

Most patients make a full recovery after a PE, but some may experience long-term symptoms, such as shortness of breath due to lung or RV damage. Thus, the interest in more-complete resolution as quickly as possible. Direct catheter thrombectomy returns patients to activities in days versus the weeks or months sometimes required to dissolve a PE by conventional IV lysis. If the PE dwells partially, symptoms and risk of lasting effects may also linger.

Longer-term anticoagulant therapy after resolution of a PE will depend on the presumed cause or a repetition of the PE. The success of catheter-based thrombectomy has already led to a trend to opt for this approach in more patients with moderate (acute intermediate-risk) PEs.

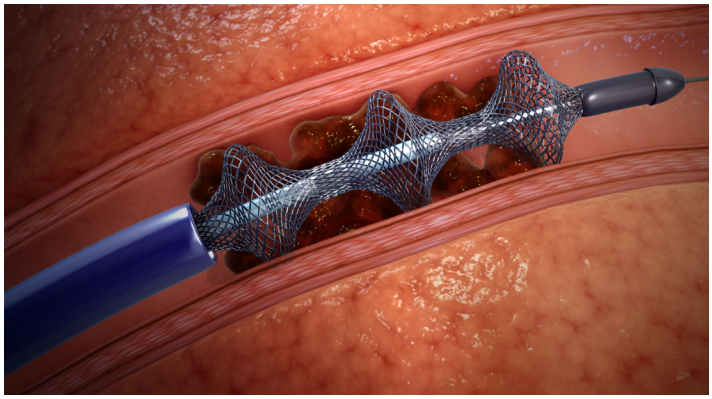

Image courtesy Inari Medical

The Virtua PE team is also participating in the FLARE-FT2 multicenter study evaluating a new FlowTriever tip with nitinol-mesh discs for clot capture.

To contact the interventional cardiology service at Virtua, call the Virtua Transfer Center at 856-757-3284.

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Case Review: Fast Pulmonary Embolism Response Returns Patient to Activities Within Days

Michael Nixon, a 53-year-old, Riverside, New Jersey resident who maintains rail cars for the NJ Transit River Line, found himself unable to breathe one morning last year. A chest X-ray at an urgent care location indicated a possible PE. Nixon had experienced leg swelling previously, but no connection had been made to a possible DVT, and he had no other risk factors for PE other than an elevated BMI.

Arriving by ambulance to Virtua Mount Holly Hospital and on oxygen, Nixon was immediately in the care of Virtua's PERT team. A CT angiograph and other diagnostics confirmed that he was at significant risk from heart strain due to a PE. He received heparin to prevent enlargement of the clot.

"Michael's clot was big enough to threaten his life, and yet he was stable enough for us to avoid tPA administration and instead quickly evaluate options for direct catheter treatment of the PE," said Virtua interventional cardiologist Luai Tabaza, MD, FACC, FSCAI, FSVM, RPVI.

In the cardiac catheterization lab, the PERT team elected to conduct a mechanical aspiration of the thrombus. Placing the patient under conscious sedation, they advanced the FlowTriever device from his groin to the pulmonary artery and used suction to draw Nixon's clot out, immediately reversing his status and restoring blood flow.

"As soon as they performed the operation, I could breathe again," said Nixon, who returned home from the hospital after just two days of observation with confirmation that his heart and lung function were completely restored.

"Direct catheter resolution of PEs not only saves lives, but vastly de-escalates care for these patients, compared to days or even weeks in the ICU to undergo conventional anticoagulant therapy — and so also reduces risk of long-term sequelae in these patients," explained Dr. Tabaza.

Nixon's PE appeared unprovoked (by recent surgery, cancer, sedentary period, or other risk factors that determine the period necessary for anticoagulant therapy), and so he remained on anticoagulants for just six months. However, he will need long-term therapy if he experiences a recurrence. Nixon has returned to full work and life activities.

Images courtesy Inari Medical

(Above) PE illustration. *(Below)* Angiographs before and after mechanical pulmonary thrombectomy. Virtua is participating in the nationwide PEERLESS study to gather additional comparative data on pulmonary thrombectomy with FlowTriever versus catheter-directed lysis.