

# CARDIOTHORACIC SURGERY TODAY



## ► CASE REVIEW: Three-Part Total Aorta Repair

### 1st Surgery: Hemi-Arch Replacement

In April 2022, a 62-year-old man, T., arrived at the Virtua Our Lady of Lourdes Hospital emergency department with sudden-onset chest pain. The patient had a history of hypertension, and CT angiography showed a Type-A aortic dissection (ascending aorta). The false lumen pathology included the transverse aortic arch extending to the abdominal aorta.

With the patient under general anesthesia in the operating room, transesophageal echocardiography confirmed the diagnosis. T. also had aortic valve insufficiency, but not severe enough to require valve replacement or resuspension. Virtua's cardiothoracic surgery team immediately sought to eliminate the entry tear in the aorta.

Surgeons established peripheral cardiopulmonary bypass (CPB) via femoral arterial and venous cannulation. A retrograde cardioplegia catheter, placed in the coronary sinus, stilled the heart. The operation necessitated complete cessation of circulation, so the team initiated deep hypothermic circulatory arrest (DHCA), cooling T.'s body temperature to 22°C. To protect brain function and prolong safe duration of DHCA, the team also established bilateral antegrade cerebral perfusion by clamping the innominate and left carotid arteries with direct cannulation and connection to the CPB to enhance CNS arterial perfusion.

The surgeons removed the damaged section of the ascending aorta, replaced it with a graft, closed the space of the false lumen in the aortic arch, and completed the repair by performing the proximal anastomosis. They recommenced full CPB, rewarmed the patient, and then weaned the patient from cardiopulmonary bypass with surgery complete.

### 2nd Surgery: Total-Arch Replacement

By October 2023, the distal extent of the patient's thoracic aorta had enlarged. To prepare him for a thoracic endovascular aortic repair (TEVAR), the team needed to

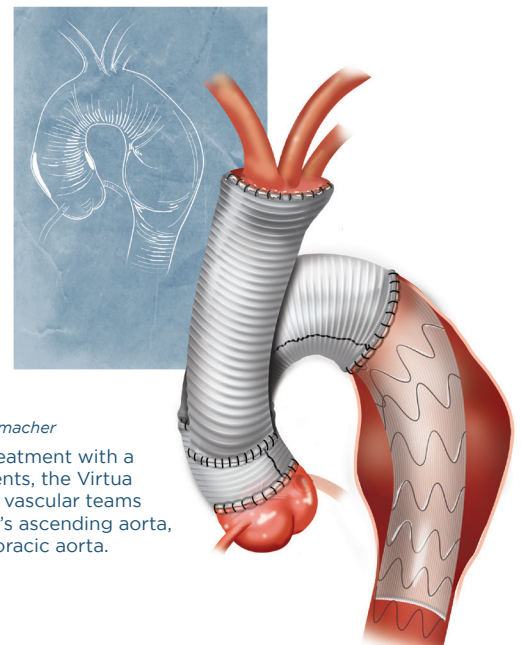
replace the aortic arch due to its residual dissection. In a second open-chest surgery—also using DHCA, antegrade cerebral perfusion, and cardioplegia—Virtua heart surgeons mobilized the ascending aortic graft, made an aortotomy, and removed the dissected arch, while keeping the aortic head vessels together “on an island.”

They introduced a tube graft to replace the aortic arch. They then anastomosed the graft to the proximal descending aorta and to the previously placed ascending aortic graft. They rejoined the aortic head vessels to the ascending aortic replacement as well, via an additional graft in a Y formation. They then pressurized the aorta to confirm hemostasis.

### 3rd Surgery: Thoracic Graft Placement via TEVAR

In April 2024, as a final phase of this three-part procedure, T. underwent a TEVAR (not to be confused with a transcatheter aortic valve replacement, or TAVR). Using femoral access, Virtua vascular surgeon Constantine Andrew, MD, successfully placed a graft in T.'s descending aorta to exclude the enlarged section of his aorta. The patient is doing well, with dramatically less chance of the catastrophic aortic event that had threatened his life.

“This case highlights how we can address the whole aorta in a stepwise fashion if needed, according to disease progression,” said Virtua fellowship-trained cardiothoracic surgeon, Eden Payabyab, MD.



*Illustration Paul Schiffmacher*

In a three-phase treatment with a total of four segments, the Virtua cardiothoracic and vascular teams grafted the patient's ascending aorta, aortic arch, and thoracic aorta.

# Experienced Surgeons Expand Virtua Cardiothoracic Surgery Capacity



**Arthur Ng, MD**

"As adult cardiothoracic surgeons, our job is to map out a holistic approach to each patient's care, whether that involves a six-month plan—for before, during, and after surgery—or monitoring a disease process for when a patient might reach the threshold

for surgical intervention," said Arthur Ng, MD, who recently joined Virtua from Hackensack University Medical Center.

Dr. Ng trained at Yale New Haven and University of Chicago hospitals. His in-depth experience has included faculty appointments at Cooper University Hospital and UMDNJ-Robert Wood Johnson Medical School.

Dr. Ng offers practiced skills in a host of areas, including valve conditions such as mitral valve regurgitation that is primary or degenerative or secondary/functional. Given the range of causes of such conditions, he emphasizes a multidisciplinary approach that includes interventionalists, electrophysiologists, and heart failure experts.

"I also see the chance for greater outreach and continuity of care," said Dr. Ng. "To provide the best service, we can be involved in everything from risk modification, to affect patients' lifestyles, to helping them plan life after rehab."



**Michael Lee, MD**

"It's important for those of us on the structural heart team to collaborate closely with interventional cardiologists to support that cross-disciplinary environment that gives the best care to patients—with everyone working together," said Michael Lee, MD, who joined Virtua's

heart care team after completing his cardiothoracic surgery and structural heart fellowships at Brigham and Women's Hospital. "Communication with patients—at bedside and in all phases of care—is also very important to me."

Dr. Lee has conducted coronary artery disease research and presented on mitral valve surgery, as well as on the effect of BMI on outcomes in cardiac surgery. He emphasizes the importance of Virtua's cardiothoracic surgery program continuing to lead the way in adopting new technology. He cites, as an example, the service's experience and leading record of success in performing transcatheter aortic valve replacement (TAVR) and in adopting use of the MitraClip™.

"Valve pathology is generally underdiagnosed across the population," said Dr. Lee. "With the strength of Virtua's multidisciplinary valve program, we are in a great position to improve awareness in the community and build a broader valve screening effort within our service area."

**To learn more or refer a patient, call 856-547-0389.  
For emergent needs, call the Virtua Transfer Center at 856-886-6582.**