

## ► New Heart Valve for a Pregnant Woman is a First

**Case:** Elenilza Souza thought she had taken care of her heart condition when, at the age of 18, she underwent a replacement of her mitral valve. So, she and her husband were alarmed when, at age 25, she began experiencing symptoms again. Elenilza imagined the prospect of another open-heart surgery.

The heart specialists at Virtua Our Lady of Lourdes Hospital assured her that they could replace her now-faulty valve using a less-invasive approach. Initially, they planned to implant a mechanical valve. But, as a matter of course, they asked this young, recently married woman an important question: Was there any chance she was pregnant? Unbeknownst to Elenilza, she was.

“That changed things and meant that we were on a clock,” said Arthur Martella, MD, Chief of Cardiothoracic Surgery at the hospital. “We believed that by her third trimester, she would be in heart failure if the condition went uncorrected.”

### Fetus and Mother at Risk

Elenilza had rheumatic fever as a child. But now, the leaflets of the bioprosthetic valve she had received had become calcified and conjoined, reducing the valve opening. With this mitral valve stenosis, her heart would not be able to handle the increased blood flow that comes with pregnancy.

“She would not be able to carry her baby to term or survive the stress of delivering a baby without our fixing her valve disease,” said Ibrahim Moussa, DO, FACC, FSCAI, RPVI, Medical Director of the hospital’s Structural Heart Program.

A mechanical valve was no longer a good option, because the Coumadin therapy required afterwards would carry serious risks to the fetus, including birth defects. A catheter-based procedure to implant a new bioprosthetic valve meant use of a blood thinner without those risks, but it still involved exposure to anesthesia and radiation. Treatment

needed to wait until the fetal organs had developed. After consulting with specialists in maternal and fetal medicine, the team targeted the 16th week of pregnancy.

The existing valve would serve as an anchor for the new valve. In April 2019 in the hospital’s hybrid operating room, the team began the procedure with a femoral catheterization. However, the specialists were unable to pierce the atrial septum, which—as they had suspected from imaging—proved to be scarred from her previous surgery.

**With two lives at stake, the team quickly switched to a different approach for accessing Elenilza’s heart valve.**

The team converted to its first contingency: the transapical approach—another beating-heart procedure, but one that accessed the heart through a small incision in the rib cage. Once in place inside the old valve, the new valve was expanded. It pushed aside the leaflets of the old valve and began to work immediately.

### Symptoms Resolved, Successful Birth

The valve Elenilza received is commonly used in transcatheter aortic valve replacement (TAVR), but is also FDA-approved for transcatheter mitral valve-in-valve replacement (TMVR)—a therapeutic option for patients with contraindications to surgical treatment and a failed surgical bioprosthesis. It is unknown how long the devices, made from a combination of animal tissue and synthetic material, will continue to function satisfactorily, though it is expected they will last at least a decade.

Elenilza was ambulatory within a few days and she gave birth without incident to a healthy baby on October 1, 2019. Someday, she will undergo a second surgery to receive yet another device: a fully mechanical valve that will last the rest of her life. Her case was the first use of a TAVR valve in a mitral position in a pregnant woman. To learn more, visit [virtua.org/heart](http://virtua.org/heart).

Virtua Cardiology stands ready to evaluate and treat your patients in locations that incorporate the new social distancing, safety, and cleaning protocols developed in the wake of COVID-19. To learn more about the safety precautions that are now a part Virtua’s standard operating procedures, visit: [virtua.org/coronavirus](http://virtua.org/coronavirus).

## TAVR Gets Safer with New Intervention for Patients Who Have Special Aortic Valve Anatomy

The Structural Heart team at Virtua Our Lady of Lourdes Hospital was recently the first in the area to perform a new technique designed to prevent potentially fatal coronary artery obstruction during heart valve replacement surgery. When specialists insert a new aortic valve via catheter, the patient's existing valve leaflets may get pushed against and block the blood supply for the coronary arteries. Now, though, the team can cut these leaflets in advance in at-risk patients to prevent this rare but dangerous complication.

In the years since transcatheter aortic valve replacement (TAVR) became available, the Structural Heart Program at Virtua Our Lady of Lourdes has been a regional leader in the procedure. During TAVR, the interventional cardiologist uses a balloon catheter to open a new valve inside the aortic valve. The new valve immediately restores proper blood flow.

TAVR is an effective and less-invasive approach to treating aortic valve stenosis. However, coronary artery blood flow is fed directly from the base of the aorta, very close to the location of the existing natural or previously implanted bioprosthetic valve leaflets. Thus, the outlets for critical coronary circulation can be inadvertently obstructed by implantation of the new valve, especially in patients whose hearts have uncommon structures, such as unusually large valve leaflets or small aortic roots.

The Virtua team, though, can detect this anatomy by CT and other imaging in advance of TAVR. And now—in a step called Bioprosthetic Aortic Scallop Intentional Laceration to prevent Iatrogenic Coronary Artery obstruction

(BASILICA)—these specialists can use a tiny electrified wire to split the leaflet and splay it open to leave it in a V shape. Lacerating the aortic cusp prior to percutaneous aortic valve implantation prevents the leaflet from blocking the root of the coronary artery.

Developed at the National, Heart, Lung, and Blood Institute, the BASILICA procedure averts the devastating complication of blockage of the left or right coronary arteries by either native valve leaflets or bioprosthetic valve leaflets in valve-in-valve procedures. Using BASILICA, cardiologists have improved the safety profile of TAVR even further at Virtua Our Lady of Lourdes, which was recognized by Watson Health in its 2020 list of Top Cardiovascular Hospitals.

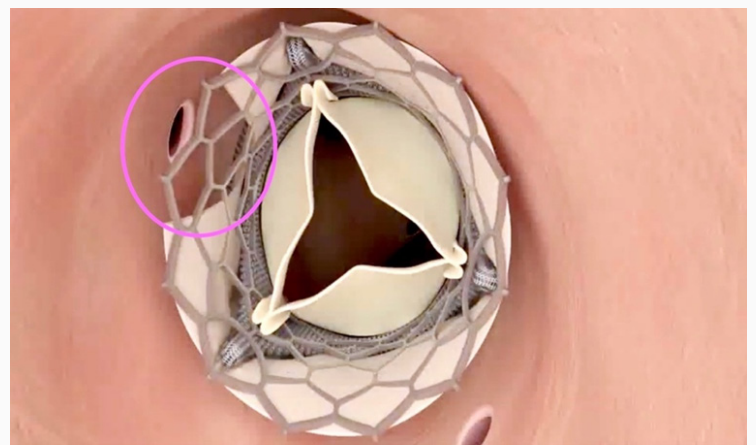


Illustration shows TAVR valve in place and coronary artery outlet (circle) protected by surgical bifurcation of previous aortic valve.