

Henry Ford Hospital: New left-side heart pump improves right-side heart function

May 27 2010

A state-of-the-art heart pump, designed to maintain a continuous flow of blood in end-stage cardiac patients with damage to the left side of the heart, also improves function on the right side of the heart, according to researchers at Henry Ford Hospital's Heart and Vascular Institute.

"Very little has been published regarding the ability of continuous flow pumps to have similar effects on the right ventricle," says study lead author Jeffrey Morgan, M.D., director of Cardiac Surgery Research at Henry Ford Hospital. "So we set out to evaluate its short-term and mid-term effects on central venous pressure and pulmonary artery pressures, on the severity of tricuspid regurgitation, as well as on the functioning of the right ventricle."

The study will be presented May 27 at the American Society for Artificial Internal Organs in Baltimore.

The pump, a left ventricular assist device (LVAD) known as the HeartMate II, was developed by Thoratec Corporation. LVADs are used to treat patients who are not candidates for [heart transplant](#), and offer the advantage of being replaceable.

When implanted just below the [heart](#) and connected to a patient's diseased left ventricle - the heart chamber that pumps blood into the body through the aorta - it provides a constant, rather than a pulsing, flow. The only moving part in the HeartMate II is a tiny turbine with synthetic ruby bearings, lubricated by the blood itself. It's powered by a

battery pack worn outside the body and connected by wires through the chest wall.

An earlier version of the device, which was larger and more complicated, was designed to mimic the heart's natural pulsing, but its size and the intricacies of its mechanism called for a simpler, smaller device that could also be used in more and physically smaller heart patients. Those implanted with the newer device have virtually no pulse because of the continuous blood flow.

Earlier studies showed that the pulsing, left-side version improved pressure in the pulmonary artery, which carries blood to the lungs from the right ventricle; improved function in the right ventricle; and reduced the severity of tricuspid regurgitation, a disorder that causes blood to leak back into the heart's atrium - the upper chamber on the right side - through the valve that's supposed to prevent such backward flow.

For the Henry Ford study, researchers monitored 41 patients, who were implanted with the HeartMate II to treat chronic heart failure, from March 2006 to July 2009. The mean age of the study group was just over 52 years.

At the end of the study, they found significant improvements in all of six measures included in the research, similar to published data for the earlier version of the HeartMate.

A companion study from Henry Ford also found that the HeartMate II, which is implanted in a much less invasive surgical procedure than its predecessor, also carried a far smaller risk of infections related to the device.

Provided by Henry Ford Health System

Citation: Henry Ford Hospital: New left-side heart pump improves right-side heart function (2010, May 27) retrieved 4 May 2024 from <https://medicalxpress.com/news/2010-05-henry-ford-hospital-left-side-heart.html>

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