Impella 2.5 Ventricular Assist Device

The Impella 2.5 ventricular assist device (VAD)—the world’s smallest heart pump—unloads the left ventricle rapidly and effectively to provide partial circulatory support with no need for incisions in patients with weakened heart function. The Impella 2.5 has been shown in multiple studies to increase cardiac output more than an intra-aortic balloon pump can. Cardiologists at the Oregon Heart & Vascular Institute have begun using the device in high-risk percutaneous coronary interventions and acute myocardial infarction with cardiogenic shock. Cardiologist Dennis Gory, MD, successfully deployed the first Impella 2.5 VAD on March 11, 2011, with a patient at Sacred Heart Medical Center at RiverBend.

Technology

The Impella 2.5 is inserted into the left ventricle through the femoral artery. The tip of the catheter contains a pigtail that crosses the patient’s heart valve and rests in the left ventricle, generating flows up to 2.5 liters per minute to the ascending aorta. The device reduces myocardial oxygen consumption, improves mean arterial pressure and reduces pulmonary capillary wedge pressure. It supplements traditional coronary angioplasty for patients considered too high-risk for cardiac bypass surgery.

The Impella 2.5 has several advantages over the intra-aortic balloon pump (IABP), which for the past 40 years has been the most commonly used device for circulatory support. For an IABP to be effective, patients must have some level of left ventricular function and a stable electric rhythm, features that may not be consistently present in a critically ill patient. Studies have shown the Impella to provide a greater increase in cardiac output than the IABP. The Impella does not require timing or a trigger from an electrocardiographic rhythm or arterial pressure.

Benefits

- Minimally invasive
- Hemocompatible
- Easy to place and operate
- Reduces rates of hemolysis, bleeding and stroke
- Enhances limb and tissue perfusion
- Unloads the left ventricle and increases cardiac output
- Restores hemodynamics
- Improves outcome and valve functioning
- Decreases myocardial workload and oxygen consumption

FOR MEDICAL PROFESSIONALS

The Impella 2.5 heart pump, the smallest in the world, provides partial circulatory support with no incisions.

Sacred Heart Medical Center
PeaceHealth
OREGON HEART & VASCULAR INSTITUTE

The Oregon Heart & Vascular Institute is one of the premier centers in the Pacific Northwest for providing state-of-the-art clinical services, medical excellence and quality outcomes combined with an exceptional and unique patient experience. Located at Sacred Heart Medical Center at RiverBend, OHVI is comprised of area cardiologists, cardiothoracic surgeons, interventional radiologists and vascular surgeons partnering with researchers from the University of Oregon in Eugene.

FOR MEDICAL PROFESSIONALS

Learn more about our referral services, important contact information and CME offerings at www.peacehealth.org/medpro.

Research

A 10-center study looked at 144 consecutive high-risk PCI patients with complex or high-risk coronary lesions and reported successful passage through the femoral artery and implantation of the Impella 2.5 into the left ventricle in all 144 patients. The study (The Europella Registry) also reported a low rate of major adverse cardiac and cerebrovascular complications and zero percent device malfunction.

An earlier study (The USpella Study) involved 181 patients who underwent high-risk PCI and acute myocardial infarction treatments using the device. Those data showed improved levels of ejection fraction and a low incidence (6 percent) of major adverse cardiac events with a 30-day survival rate of 97 percent.

A small trial (ISAR-SHOCK) evaluated the safety and efficacy of the Impella 2.5 versus the IABP in patients with cardiogenic shock caused by acute myocardial infarction. Improvements in cardiac index were significantly greater in Impella patients than in IABP patients. Mean arterial pressure increased slightly in Impella patients. Serum level of lactate was lower and hemolysis was higher in patients treated with Impella.

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