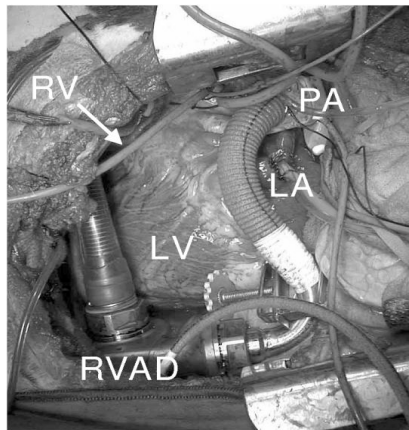


A VAD, commonly referred to as a ventricular assist device, is a device that replaces some or all function of a failing heart.

Beginning in April 2005, DexAide has begun development on the first implantable and internal RVAD, right ventricular assist devices. The reason for this is because although the use of left ventricular assist devices (LVAD) have been increasing, over 39% of patients with a VAD, have an RVAD.

The evaluation & analyzing of this device was done using 4 live calves. These animals were properly sedated before hand.

Below shows the image of the DexAide RVAD connected at the right ventricle & the pulmonary artery. The device is inserted into the chest cavity & secured/stabilized by the diaphragm.



The DexAide RVAD - prototype

The DexAide RVAD consists of 3 major components. The first is the volute housing assembly. This is simply a container that houses all of the necessary blood to be pumped. The second piece is the rotating assembly. This simply pushes the blood throughout the device. The last piece of the device is the stator assembly. This simply collects the necessary data readings for the analysis.

The study to be performed analyzed how accurately the DexAide would operate under different conditions of the heart. The conditions to be tested were...

- 1- High Pulmonary Arterial Pressure
- 2- High Contractability
- 3- Low Contractability
- 4- Low Circulating Volume
- 5- Vasodilation

This was achieved by varying the pump speed within the range of 1,800 – 3,600rpm. High pulmonary arterial pressure was induced using a vascular tourniquet, placed distal to the pulmonary anastomosis. High & Low Contractability was induced using an infusion of dobutamine & esmolol bolus, respectively. Vasodilation was induced using nitroprusside, & lastly low circulating was induced by simply withdrawing some of the circulating blood.

The hemodynamic variables were then recorded into PowerLab, and further analyzed. One way it was further analyzed was through the Tukey – Kramer test. Other equations include pump efficiency, pressure, power, & normalized power. The analysis of the DexAide RVAD showed acceptable characteristics for use as an implantable RVAD. Pump flow correlates well with pump speed, pump flow is limited by circulating volume, & pulmonary arterial pressure seemed near constant with pump speed.

Future plans for the DexAide RVAD include examining biocompatibility, work performance under real life chronic conditions, and clinical testing on humans. As of right now, “There is no commercially available implantable RVAD in the United States.” States Dr. Kiyotaka Fukamachi, founder of the RVAD.

Pros from this device include saving many more lives, less patient limitation, & no external devices. The current cons are bleeding, anticoagulation problems, device errors, & hospitals having primitive technology.

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