Propeller gives new boost to the heart

Medtech company CardioBridge GmbH of Hechingen, Germany, has achieved a minor sensation. Initial use on humans of the Reitan catheter pump it has developed for minimally invasive treatment of patients with cardiac failure was a resounding success. CardioBridge is currently working on CE accreditation to ensure the pump can become a clinical standard as soon as possible for the benefit of patients.

Every day, cardiovascular patients are admitted to countless hospitals all over the world, and every second counts. Doctors may manage to eliminate the cause and clear the arteries but the heart may not restart immediately. The diagnosis is cardiogenic shock, and the organs that rely most heavily on a fully functional blood flow, first and foremost the kidneys, now begin to sustain damage or fail completely. Ten percent of all heart attack patients risk suffering cardiogenic shock, with one in every two of these dying from this.

Cardiologist Dr. Oyvind Reitan from Sweden had long been aware of this problem. While he was relaxing from hospital-related stress on his small sailing boat, the boat’s collapsible propeller engine gave him an idea that has long since been patented. In the mid-1990s, he carried out research into powerful mechanical cardiac support in the form of a propeller. When folded up, it is very small and therefore easy to insert. Once folded out, surrounded by a cage that opens up to protect the surrounding body tissue, it offers extremely high pumping power. Contact with Swedish entrepreneur Lars Sunnanvåder, the “father” of many small start-up companies in Hechingen, the “Silicon Valley of medical technology”, finally brought the Reitan pump to the STERN BioRegion for further development. It is now being prepared at CardioBridge by Klaus Epple, Director of Research and Development, and Chief Executive Officer Thomas Radtke for a global market launch.

The Reitan Catheter Pump (RCP) is a minimally invasive circulatory support system for femoral insertion. © CardioBridge GmbH
Initial use at the start of this year resulted in an immediate sensational effect. At the University Hospital of Lund, Sweden, a 65-year-old man with acute cardiac and renal insufficiency was saved from the threat of renal failure. The pump, which is only around three millimetres wide when folded up, was inserted into the femoral artery in the groin and pushed right up into the aorta. Once extended, the propeller displayed its high flow power. It works by relieving pressure on the heart and provides a flow to the organs to counteract the danger of multiple organ failure. A sustained improvement in the patient's circulation and renal function was achieved within only twelve hours and thus in a much shorter period than planned. "The doctors in Lund could scarcely believe it," says Radtke. "A veritable crowd gathered outside his room."

Since then, it has been possible to stabilise 15 patients in Sweden and the United Kingdom using the Reitan pump, despite the patients' sometimes critical state. "Our pump helps the heart regenerate so that it can once again perform its vital function," explains Epple. "This medical product is far superior to the previous standard, the balloon pump for mechanical cardiovascular support developed in the 1970s. The balloon pulsates and becomes dynamic by being inflated. The propeller generates a very much stronger flow, thus providing an optimum supply to the organs."

Further studies are necessary to obtain CE accreditation for the product - and naturally investors are needed to finance these. "Cardiologists who we present our pump to are instantly impressed," says Radtke. "Now, in these difficult times, we need to win over more investors." BioRegio STERN Managing Director Dr. Klaus Eichenberg is fully convinced by the success of the company and will do all he can to support it: "CardioBridge was honoured in 2005 by the 'German Tech Tour' as a potential world market leader in the medtech sector, and I can emphatically reaffirm this assessment."

**Further Information:**
CardioBridge GmbH
Klaus Epple
Lotzenäcker 3
72379 Hechingen
Phone: 07471-180535-10
E-Mail: Klaus.Epple(at)cardiobridge.com

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