

WORLDWIDE FIRST CLINICAL IMPLANT OF A MINIATURE CARDIAC ASSIST PUMP WITH HYDROMAGNETICALLY LEVITATED ROTOR

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In recent years cardiac assist pumps are becoming an established therapy for patients in terminal heart failure either as a bridge to transplant, but also as destination therapy. However, the considerable invasiveness of the operation and the required anticoagulation cause still considerable risks for the patients and limit the outcome. A new generation of pumps tries to minimize these risks by freely levitated pump components and minimized size.

Now a new pump became available, in which the rotor is levitated by hydraulic forces and permanent magnets only, which allows a miniaturization down to a diameter of 4 cm and a height less than 2 cm, and with connection of a thin cable with only four leads to the power supply.

This device, which was developed by Heartware Inc., Florida also with contributions of our group, was after extensive tests first clinically implanted in Vienna since March 2006, up to now in two patients. Both patients recovered well and rapidly from the operation. One could already be discharged from hospital, the second one is already doing moderate physical exercise at the standard ward. Plasma-free haemoglobin and LDH remained below the upper level of the normal physiological range. All technical systems worked properly, with no adverse events yet detected. Batteries allow up to 10 hours of unthetered mode.

In conclusion, this system allows a moderately invasive implantation and proves in this preliminary study to generate only minimal blood trauma. Provided a continuation of these promising preliminary results the system will considerably widen the indications for this therapy.

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