

Remote Heart Operation Performed Using Robotic Arm

An expert at University of Leicester and Glenfield Hospital will use the Catheter Robotics Remote Catheter Manipulation System for the first time in a heart rhythm treatment procedure.

April 30, 2010

A pioneering world first robotics system operation is to be conducted at Glenfield Hospital Leicester thanks to expertise at the University of Leicester and University Hospitals of Leicester.

Dr André Ng, Senior Lecturer in Cardiovascular Sciences at the University of Leicester and Consultant Cardiologist and Electrophysiologist, Glenfield Hospital, University Hospitals of Leicester, is the first person in the world to carry out the operation remotely on patients using this system.

He will use the Catheter Robotics Remote Catheter Manipulation System for the first time in a heart rhythm treatment procedure.

The system is novel because it allows a doctor to carry out a common heart treatment procedure remotely using a robotic arm.

These procedures involve inserting thin wires, called catheters, into blood vessels at the top of the groin and advanced into the heart chambers. Electrodes on the catheters record and stimulate different regions of the heart to help the doctor identify the cause of the heart rhythm problem which usually involves an abnormality in the electrical wiring system of the heart. Once this area is identified, one of the catheters will be placed at the location to ablate or "burn" the tissue to cure the problem. Catheter ablation has been developed and used over the past 2 decades effectively in many patients suffering palpitations due to heart rhythm disturbances.

Dr Ng said: "The new Robotic procedure is an important step forward because, while some procedures are straightforward, others can take several hours. Because X-rays are used to allow the doctor to monitor what is going on inside the patient, it means that doctors standing close to the patient wear radiation shields such as lead aprons which are burdensome. Protracted procedures can lead to clinician fatigue and high cumulative radiation exposure.

"The benefit of the Robotics system to the patient is that movement of the catheter could be done with great precision. It is anticipated that further developments of the system may allow complex procedures to be made more streamlined. On the

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Published on Surgical Products (<http://www.surgicalproductsmag.com>)

other hand, benefits to the doctor are that heavy lead aprons would not be necessary as he / she will be controlling the movements of the catheter using the Remote Controller at a distance from the patient outside the radiation area and that he / she can be sitting closer to the monitors displaying electrical signals and x-ray images as opposed to standing at some distance across the room from them which is current practice." Dr Ng and his team's international standing and leading position in the management of heart rhythm disorders are reflected in the invitation to be the first to apply this new Robotics System in clinical procedures which also affirms the world-class research and pioneering work at the University of Leicester.

The Remote Catheter Manipulation System (RCMS, Catheter Robotics Inc., New Jersey) is a new system and Dr André Ng, who has extensive experience in EPS procedures, has been selected to apply the system in human studies for the first time in the world. Two other remote navigation systems are commercially available but one uses a huge magnetic field to control a magnetic tip catheter whilst the other uses a large deflectable sheath to move the catheter. The RCMS has the benefit of using standard EPS catheters which can be dismantled and remounted onto the system with ease. The technology has obtained CE mark through rigorous bench safety testing and pre-clinical studies and has now arrived at a stage where it can be applied to clinical procedures.

Dr Ng is an expert in the management of heart rhythm disturbances especially in catheter ablation and the use of mapping systems in such procedures. The Department of Cardiology at Glenfield Hospital is one of the largest Electrophysiology Centers in the UK performing over 600 EPS procedures every year. Dr Ng has a distinguished research profile in investigations into cardiac electrophysiology and arrhythmia mechanisms, leading both non-clinical and clinical teams of talented researchers. At the cutting edge of scientific research and development, the innovative work in his group has been acknowledged with many accolades including Young Investigator and Da Vinci Awards. He is also Director of pan-European training programs on advanced three-dimensional mapping systems and arrhythmia ablation.

Source URL (retrieved on 01/29/2015 - 4:51pm):

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