

Medical technology | Medical devices | Technology Offer

Esophagus electrode probe and method for cardiological treatment and diagnosis

Field of application

Along with atrial and ventricular tachycardia, atrial fibrillation is the most common persistent cardiac arrhythmia, which now affects almost 1.8 million Germans. Cardioversion can be treated with medication; however, catheter ablation has become the established method of choice, not least due to the considerable side effects of medication. The ablation of tachyarrhythmias is considered a comparatively gentle interventional electrophysiological procedure and was performed more than 80,000 times in Germany in 2016, with an upward trend.

During ablation, the heart muscle tissue is selectively heated (HF, laser) or cooled (cryo) by means of a catheter, which results in the formation of scar tissue. The structured insertion of scars can limit the function of nerve tracts and myocardial tissue (e.g. PVI or substrate modification), which consequently prevents the negative influence on the heart rhythm.

State of the art

Esophageal catheters are used to monitor this procedure and to perform further non-invasive diagnostics (e.g. TEE, EPS). The proximity of the left atrium to the esophagus carries the risk of perforations from the left atrium to the esophagus during ablations. To avoid complications, the parameters of the surrounding tissue should be constantly monitored. However, conventional methods use probes whose sensors only measure the temperature in the esophagus on the heart side.

Innovation

The invention of the Offenburg University of Applied Sciences relates to a procedure and the associated esophageal electrode probe, which is equally suitable for the diagnosis and therapy of cardiac arrhythmias and consequential interventions, as well as for the preparation of neurological findings. This catheter has additional electrodes for bioimpedance measurements and neurostimulation on the side remote from the heart, which allows for more precise monitoring of tissue condition and pain reduction in transesophageal electrostimulation. Tissue changes can now be monitored via the electrodes on the heart side and continuously compared with the parameters on the opposite side. This results in a considerably more precise assessment of the situation, which effectively reduces the risk for the patient. Furthermore, transesophageal hemodynamic monitoring is also quite easy to implement with this catheter.

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Your benefits at a glance

- ✓ Bioimpedance measurement and neurostimulation on the side remote from the heart
- ✓ More reliable monitoring of an ablation through comparative measurements
- ✓ Transesophageal hemodynamic monitoring
- ✓ Pain reduction in transesophageal electrostimulation by neurostimulation

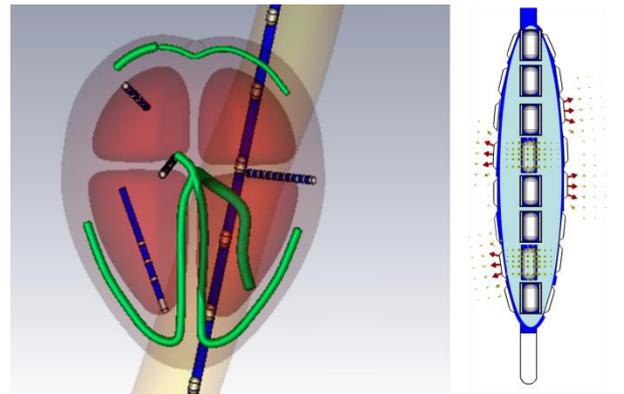


Figure: Heart rhythm model with conduction of excitation, heart catheter positions and esophageal catheter (left) and detail of the catheter model with sensors on both sides (right).

Technology transfer

Technologie-Lizenz-Büro GmbH is responsible for the exploitation of this technology and assists companies in obtaining licenses.

Patent portfolio

DE application pending, international applications are planned.

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