



FINAL THESIS

Design and Installation of an automated HF-Electrode Test Rig

General

Transurethral Resection (TUR) is a minimal-invasive Therapy method in which prostate or bladder tissue is resected, vaporised or coagulated by using HF-energy. The verification of different electrode designs needs a lot of time and can only be done by hand at the moment. In the future an automated test rig should lead to repeatable and user independent results.

Task

The task is to design and install a test rig for HF-resection electrodes to test the performance and durability of different designs. For this the electrode or/and the resectoscope need to be moved relative to the tissue. The controlling of the generator should be realised in dependency of several parameters. For example the force that is applied to the tissue by the electrode needs to be detected in vertical and horizontal direction. A continues irrigation flow through the resectoscope and temperature measurement are also necessary.

Basic Requirements

- Movement of the test sample relative to the tissue (3D)
- Generator control or triggering
- Flow control
- Evaluating of an applicable tissue
- Force measurement (vertical and horizontal)
- Temperature measurement of the irrigation liquid

Sub Tasks:

- Conception and draft (pre project information existing)
- Design and refinement
- Configuration and installation
- Programming
- Optimisation
- Testing
- Analysis and assessment of results

The project should be done full time as a scientific thesis project and will take place in cooperation with the R&D department of Olympus Surgical Technologies Europe in Hamburg. After clarifying the working packages it is also possible to split in smaller (parallel or serial) projects.

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