

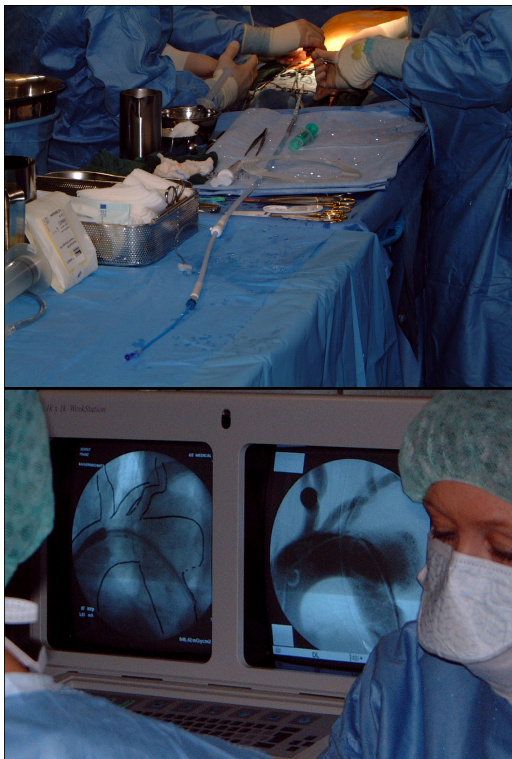
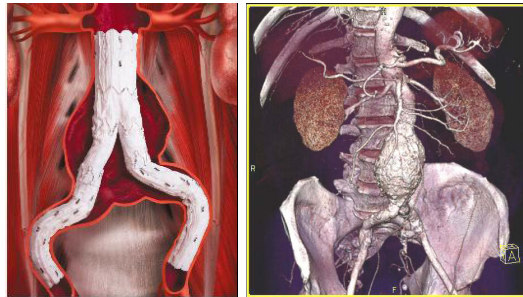
Bringing Registration and Visualization for Stent Implantations to the OR

Background:

Stenting is a technique used to treat aortic aneurisms (sacs formed by the dilatation of the wall of the aorta). By injecting a catheter, a cylindrical prosthesis (stentgraft) is pushed through the aorta to the aneurism to replace/stabilize the inner wall of the aorta.

Pre-operatively, a CT data set is taken for diagnosis. Intra-operatively, X-ray images are taken to control the position of the stent.

For future interventions, the number of intra-operative X-ray images shall be reduced to lower the patient's risks. Therefore, the position of the stent needs to be visualized intra-operatively.



Details:

The diploma thesis consists of following parts:

- Evaluation of an existing prototypic system for registration and navigation
- Calibration of the C-arm
- Segmentation of the aorta using/extending algorithms developed at CAMP
- 2D/3D registration of the pre-operative CT data set and the intra-operative X-ray images using/extending algorithms developed at CAMP
- Design of a method to track the catheter
- Design and implementation of an intuitive and easy user interface suitable for the operating room to visualize the current position of the stent inside the CT data
- Evaluation of the system

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