3D syngo DynaCT during EVAR

Johannes Gahlen, MD, PhD – Department for Vascular and Endovascular Surgery, Ludwigsburg Hospital, Germany

Illustrated Workflows in Hybrid Operating Rooms, No. 4
Clinical case
Endovascular aortic repair including coiling of the arteria mesenterica inferior

The 67-year-old male patient presents with a quickly progressing infrarenal aortic aneurysm. The aneurysm is limited to the ostia of the arteria mesenterica and morphologically classified as penetrating atherosclerotic ulcer (PAU).

The EVAR procedures included the coiling of the arteria mesenterica inferior with an Amplatz Vascular Plug II.

Department for Vascular and Endovascular Surgery
Ludwigsburg Hospital

The Ludwigsburg clinical center is an academic teaching hospital of the University of Heidelberg with more than 1000 beds. The 17 departments and four institutes provide high-quality medical care for around 40,000 inpatients and 130,000 outpatients each year.

The department for vascular and endovascular surgery is headed by Dr. Gahlen (right), who treats approx. 1700 patients annually. Dr. Gahlen works closely with his second-in-command Dr. Staiger in the newly built hybrid operating room, focusing on endovascular repair of abdominal and thoraco-abdominal aneurysms. Most recent techniques, like fenestrated stent grafting, are applied in this room to provide optimal care for patients.
The Hybrid Operating Room

Arts reego is installed in the hybrid operating room at the Ludwigsburg clinical center in a so-called 30-degree installation, i.e., the stand of the robotic imaging system is mounted in the corner of the room rotated 30 degrees with respect to the surgical table. The imaging system is integrated with the TruSystem 7500 OR table from Trumpf and a large 56-inch medical-grade screen can be flexibly moved along the table on a display ceiling suspension (DCS) with a large 56-inch monitor. Two marLED OR lamps on KLS Martin booms are mounted directly above the OR table.

The room accommodates two anesthesia outlets on Dräger booms, one at the foot end and one to the left of the patient’s head. A sophisticated RGB lighting system by Trilux is installed in the room, which turns the room to a light blue color via a wireless Osram controller during imaging.
The left picture shows Artis zeego in a park position, enabling unrestricted access to the patient. The OR table is rotated by 15 degrees with respect to the Artis zeego stand. This provides flexibility in OR space usage and optimizes the C-arm position during imaging without complicating the actual procedures, as illustrated in the right picture. The detector and the collimator of the C-arm are adjusted automatically to the table rotation, always providing an upright image.

The OR lamps are installed directly above the OR table and their position does not need to be changed when the C-arm is moved from the park position into the surgical field. The laminar air flow field is also not affected by the imaging system.
Enhanced infection control

The acquisition of a 3D syngo DynaCT requires a 200-degree rotation of the C-arm around the patient. Covering the patient with an additional sterile sheet and taping the sheet around the table optimizes the hygiene in the OR and minimizes the infection risk for the patient ("mummification technique").
Acquisition of a 3D syngo DynaCT image

During the 3D acquisition the C-arm rotates around the patient in 5 seconds. The surgeon controls the acquisition from a separate control panel on a trolley. The contrast agent is injected by an automatic injection controller which is triggered by the imaging system.
Keeping everything under control

Aris zeego is designed in such way that the anesthesiologist can access the patient whenever required during the procedure. The imaging system provides enough space for him and his equipment.

syngo DynaCT imaging provides a unique 3D orientation of the intra-operative anatomy and helps verifying completion, e.g., identification of possible endoleaks.

3D syngo DynaCT is also the prerequisite for endovascular 3D guidance based on the actual anatomy in the procedure, taking intra-operative deformations of the aorta into account.
Benefits

- High-end 3D imaging in the OR for sophisticated endovascular interventions including branched and fenestrated stent grafting
- No ceiling-mounted components in the laminar airflow, i.e. reduced risk of infection and collision with OR lamps
- Table rotation optimizes OR space usage and enables flexible imaging
- Detector and collimator are rotated according to table rotation providing an upright image from any angulation
- 3D imaging in a sterile environment
- Dose saving measurements like Automap reduce radiation for the patient as well as staff
- Unrestricted access to the patient and substantial space for anesthesia

Configuration of the Hybrid Operating Room
Ludwigsburg Hospital

- Artis zeego with Automap functionality
- Trumpf TruSystem 7500 OR table with carbon plate
- Control panel on separate trolley and wireless footswitch
- syngo MMWP with syngo DynaCT and syngo InSpace3D Fusion, syngo 3D Basic and syngo Angio Package, syngo guilde with laser cross in the detector
- 2k acquisition with 30 x 40 detector, 3D/3D Card acquisition including DYNAVISION

- Two monitor booms equipped with one 56" screen on display ceiling suspension (DCLS extended) and two HD monitors on the opposite side
- Two anesthesia booms from Dräger
- 3.20m x 3.20m laminar air flow field
- Two marLED OR lamps on KLS Martin booms

Scan this code with your smartphone to explore more photos of this Hybrid OR solution
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