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Siemens Healthineers Introduces Innovative Robot-Supported Artis Pheno Angiography System

- Enabling personalized, minimally invasive surgery for multimorbid patients to account for the changing disease pattern
- Versatile software applications make even challenging examinations easier with the Artis pheno
- Developed using a comprehensive hygiene approach to support working in a hygienic environment

Siemens Healthineers introduces the innovative robot-supported Artis pheno angiography system at this year's German Congress for Orthopedics and Trauma Surgery (DKOU, October 25-28). The "OR of the future" lets visitors experience the Artis pheno in its typical working environment, the hybrid OR. The system was developed for use in minimally invasive surgery, interventional radiology and interventional cardiology. The zen40HDR flat panel detector and the GIGALIX X-ray tube give the Artis pheno outstanding image quality. Resolution for 2D imaging is four times higher – compared to prior systems of Siemens Healthineers – in all recording processes thanks to the system's new 2k recording technology. The StructureScout feature can adapt and optimize imaging parameters to best suit the material structure of the area being X-rayed, which enables even less radiation to be used compared to prior systems of Siemens Healthineers . Artis pheno is designed to support treatment of multimorbid patients, and can be fitted with a comprehensive range of optional software applications to deal with complex cases. Thanks to the hygiene approach developed especially for Artis pheno, the system has large, sealed surfaces with fewer spaces, which helps customers with system cleaning.

A single system for multimorbid patients

Patients often suffer from multiple health issues that can make minimally invasive surgery more difficult or even impossible. The growing number of older patients, in particular, faces additional risks because of the associated incidence of chronic disease. Siemens Healthineers has recognized these trends, and its innovative Artis pheno angiography system helps its customers respond accordingly: because it can scan up to 15 percent faster in the body area – compared to prior systems of Siemens Healthineers –, syngo DynaCT is able to produce 3D images that need less contrast agent for the imaging process. "We see a high number of multimorbid patients with impaired kidney function in the angio suite," says Prof. Frank Wacker, MD, Director of the Institute for Diagnostic and Interventional Radiology at Hanover Medical School. "Shorter scan times help reduce the amount of iodinated contrast agent during 3D angiography in the thorax and abdomen by up to 15 percent." If the patient is sensitive to the contrast agent, Artis pheno can also support CO_2 imaging of the extremities. The system follows the tilted table and increases CO_2 visibility using the new StructureScout.

The C-arm is 13 centimeters wider and has a free inner diameter of 95.5 centimeters, which offers more space for handling adipose patients and means longer instruments can be used without difficulty. The Siemens Healthineers multi-tilt table is also designed to accommodate patients weighing up to 280 kilograms. The end of the table can be tilted both up and down, to stabilize the patient's blood pressure, for example, or to make breathing easier when necessary. The robotic construction of the Artis pheno gives it a flexible isocenter that it shares with its predecessor, the Artis zeego. This means the angiography system can follow all table positions and provide the best possible imaging support for the patient's treatment, while representing the target area of the body from virtually any angle. Artis pheno can also be combined with surgical tables from Maquet und Trumpf, which enable patients to be specially positioned for operations. Typical positions involve patients lying on their side, stretched out on their side, or even sitting. Artis phenol can support imaging in all of these positions.

Healthy working position for the surgeons

The ability to work standing upright with minimum additional effort is of particular importance to enable the surgeon – wearing a heavy lead apron – to perform often lengthy operations without becoming fatigued. Surgeons must also maintain optimum access within the operating area at all times. That's why they can move the easy-float tabletop on the new Siemens Healthineers multi-tilt table with minimal effort, regardless of how much the tabletop has been tilted on either of its axes, or how heavy the patient is. Artis phenol recognizes the position of the tabletop at all

times, and automatically aligns itself to the tabletop with every movement. The memory positions let the system move the C-arm out of the operating area quickly if necessary, giving the surgeon and the operating team free access to the patient, and then move it back to exactly the same position again for further imaging. This means results can be checked directly, even while the operation is still in progress.

Support for spinal fusion procedures

To remain competitive as a healthcare provider, innovative software applications are essential, to ensure full preparedness for increasingly complex minimally invasive surgical procedures. This is why there are many additional optional application packages that can be used with the Artis pheno to suit the customer's requirements as complex cases arise. Artis pheno supports spinal fusion procedures, for example. Up to ten vertebrae can be visualized in 3D imaging using syngo DynaCT Large Volume. Syngo Needle Guidance then makes it possible to plan extensive procedures using screws or needles. Screw paths can be planned with precision, and the Automatic Path Alignment function automatically aligns the C-arm to follow them. The laser integrated in the image detector shows the surgeon the planned path, which helps improve both accuracy and speed in the OR. This can result in good savings, since longer operations mean higher costs. Using this software application can help minimize the rate of screw positioning errors in the spine and also speed up the work process in this area. Additionally, follow-up costs which might arise from corrective interventions might be reduced.

Easier identification and attribution of arterial vessels

A number of applications on the Artis pheno support transarterial chemoembolization (TACE) of tumors. TACE involves supplying embolic particles coated with a chemotherapeutic drug via a catheter directly into the arteries leading to the tumor. Using syngo DynaCT 360, it takes just six seconds for the Artis pheno to generate a large-volume image of the liver or lung, for example, including the anatomy of the tumor and the vessels leading to it. Rapid rotation is vitally important in reducing movement artifacts, since the patients are given only local sedation for the TACE procedure. The syngo Embolization Guidance application renders arterial vessels visible and helps distinguish the vessels and treatment paths using color-coding. Graphic overlaying of the selected vessel paths with the real-time X-ray images makes the vessels that supply the tumor visible for simplified microcatheter navigation which can save the dose of both radiation and contrast agent.

Special hygiene approach developed

More than 30,000 patients die in Germany every year just from infections picked up in the hospital. [1] High patient infection rates are a key challenge for hospitals, which need to be fully equipped to deal with them. That's why Artis pheno was developed using a dedicated hygiene approach. An antimicrobial coating prevents bacteria and viruses from multiplying on the system. Seamless surfaces with no recesses, and spaces that are easy to access, make the system easier to clean. The wiring is routed inside the system to prevent cables from becoming dirty and potentially transmitting bacteria. Cleaning instructions supplied with the system are intended to enable optimized cleaning and disinfection of the system. Because the system is floor-mounted, it is easier to install in the operating suite, and the sterile air flow from the ceiling is interrupted during imaging only by the flat-panel detector.

Reference:

1 Study by the German Society for Hospital Hygiene (Deutsche Gesellschaft für Krankenhaushygiene e.V.)

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Published on : Tue, 25 Oct 2016