


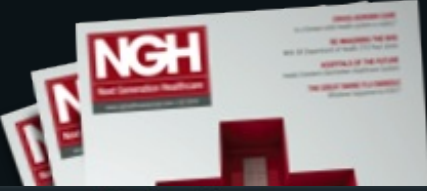


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Anatomical 3D reconstruction in the OR

Ziehm Imaging | www.ziehm.com

Ziehm Imaging's 3D C-arm technology is rapidly growing and continuously improved. The latest C-arm in the market is Ziehm Vision FD Vario 3D. With a footprint of 0.8 m², this system is one of the smallest 3D C-arms on the market. Its compact design and easy-drive system means it can be maneuvered with minimal effort during procedures. The steer and brake functions are activated via a single lever. This system combines excellent 2D image quality with a highly efficient intraoperative 3D imaging module. By delivering volume renderings and slice views similar to CT scans, the C-arm enables surgeons to perform procedures with the highest possible accuracy. Clinical studies prove that intraoperative 3D imaging with Ziehm Imaging C-arms clearly show the position of pedicle screws. This allows surgeons to immediately modify incorrectly placed screws without having to wait for a postoperative CT scan.



Blog

Our team of editors discuss what they think about the current Next Generation Healthcare issues



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23 Mar 2010

Combined with navigation systems, this C-arm is particularly suited to spinal, orthopedic as well as trauma, neuro- and craniomaxillofacial surgery and brachytherapy.

All these application require high precision due to complex anatomy. The trend of minimally invasive surgery is supported with Ziehm Vision FD Vario 3D as an interface links Ziehm Imaging's 3D C-arm with all leading navigation systems, such as BrainLAB and Stryker.

In only one minute, the C-arm captures more than 100 images and automatically generates a 3D volumetric dataset. Dose exposure is reduced to a minimum during the scan due to a rotation of only 135° and predefined dose settings on the software side. The C-arm automatically adapts all settings to the patient's anatomy. With 256 measurement cells, it automatically detects the object's position in the field of view and adjusts the system accordingly to always get a crystal-clear image - even if the object is not centred. Intelligent software also dynamically adjusts generator output and video levels to the patient's anatomy by detecting motion and any metallic devices located in the region of interest. Patients and OR staff benefit from fast, superb quality imaging and minimal dose levels.

Ziehm Vision FD Vario 3D comes with a highly compact monoblock generator. It generates short, sharp pulses with up to 25 frames per second, producing crystal-clear images even if the patient is moving. This intelligent pulse technology also reduces radiation levels.

A comprehensive range of viewing options including isocentric cine loops from 2D fluoroscopy images, volume renderings as well as oblique slice views and multiplanar reconstruction make the Ziehm Vision FD Vario 3D the surgeon's 'third eye'. The 3D volume with a resolution of 512³ voxels enables even the tiniest anatomical structures to be visualized.

The high-dynamic flat-panel of Ziehm Vision FD Vario 3D is a key component in the imaging chain. With 1k x 1k resolution and more than 16,000 shades of gray, it provides four times the graylevels of a conventional image intensifier.

Finally the touchscreen user interface offers an intelligent workflow that makes operating the C-arm easy and intuitive. Users benefit from synchronized touchscreens on the monitor cart and the C-arm, as well as clear and easy-to-follow

icons.

The Customer's Voice - Neurosurgical Experience with Intraoperative 3D Imaging

Dr. Hubbe, you as neurosurgeon at the university hospital in Freiburg are experienced in advanced spinal surgeries.

Please describe the challenges in your daily work.

In complex spinal surgery, which involves implanting screws in the spine, for example, we need the best possible view of the patient's anatomy. One way of getting this is to expose the entire spine in open surgery. Here in the Neurosurgery Department in Freiburg/Germany, we always prefer minimally invasive techniques for such procedures. Which means we need additional insights through imaging information.

You are using the C-arm Ziehm Vision FD Vario 3D for acquiring intraoperative data. How and why do you use this system in your OR?

Ziehm Imaging's C-arm is the only one to support 3D imaging with a compact footprint. We can now use the flat-panel 3D C-arm to visualize a sufficiently large field of view in detail and to scale, right up to the edge. It is also possible to use the 3D C-arm during surgery to check the position of the screws and guidewires. This means that I can see during surgery whether I have achieved my surgical aim. And - by extension - can also revise the screw position without the patient having to undergo a second operation.

This sounds like a very technical procedure....

The variable isocenter for 3D imaging allows us to position the C-arm in relation to the patient and to arrange a system set-up which suits the patient's position in the OR. This brings the patient back in the focus - even for 3D imaging.

Why did you choose the Ziehm Imaging C-arm instead of other systems available in the market?

The compact design of Ziehm Imaging's C-arm means that it is also ideal for small operating rooms. New staff quickly learns how to use it due to logical and intuitive user guidance. This C-arm clearly shows that Ziehm Imaging does not simply develop a generalized user guidance system and adapts this minimally to support varied procedures ranging from magnetic resonance imaging to angiography. What we have here is software that has been especially developed for intraoperative use of a C-arm. Initial intensive staff training resulted in a steep learning curve.

We chose this C-arm primarily based on our analysis of the technical data, which showed that Ziehm Imaging is technically ahead of the field. We have to say that it has fully met our expectations. Flat-panel technology enables us to

work with great precision in the entire dataset displayed on the monitor. We can also use the entire distortion-free 3D data set - even in the outer areas - for navigation and thus clearly speed up the workflow and progress.

In summary I can say that this C-arm has met our expectations. We routinely use 3D imaging during surgery, much more often in fact than we initially thought we would.



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