

PHILIPS

VesselNavigator

Endovascular procedures

Making the difference with Live Image Guidance

Who/where

Ghent University Hospital, Ghent, Belgium

Type: University hospital with over 1,000 beds and about 6,000 employees

Who: Prof. Dr. Frank Vermassen, MD, PhD, Vascular Surgeon and Chairman, Thoracic and Vascular Surgery Department, Nathalie Moreels, MD, Vascular Surgeon, Mia Geenens, Lead Vascular Nurse

Challenge

Improving procedural efficiency and reducing contrast medium and radiation during minimally invasive endovascular procedures.

Solution

With Philips VesselNavigator, clinicians at the Department of Thoracic and Vascular Surgery have reduced contrast medium usage for iliac, aortic, and carotid endovascular procedures thanks to the ability to use pre-operative CT/MT datasets for image guidance.

Simplicity, contrast savings, and X-ray dose reduction benefit endovascular procedures at Ghent University Hospital.

Clinicians at the Department of Thoracic and Vascular Surgery at Ghent University Hospital are among the first to try out a limited release version of Philips VesselNavigator image fusion technology. After just a few months, they have reduced the amount of contrast medium and X-ray usage for iliac, aortic, and carotid endovascular procedures significantly. The intuitive design makes it easy to use during complex interventions.



During the trial, most patients with an existing CTA or MRA were treated using VesselNavigator in the hospital's Hybrid Suite.

Surgical innovator

The Ghent University Hospital is one of the largest hospitals in Belgium. With its close links to Ghent University, this hospital is a center for scientific research and medical education. This facility is continually investing in new developments and innovations to promote high quality care and further reduce risks for patients and staff during procedures.

The Department of Thoracic and Vascular Surgery at the Ghent University Hospital is no stranger to advanced imaging technologies. Prof. Dr. Frank Vermassen says, "We've evolved our expertise in image guidance alongside Philips. We started using their mobile C-arms in the 80's and have experienced every new development as procedures have become more complex and challenging. Today we are carrying out advanced endovascular, thoracic, and fenestrated aneurysm repairs (EVAR/TEVAR/FEVAR) in a state-of-the-art Hybrid Suite with a high end Philips AlluraClarity X-ray system."

3D image fusion to support advanced endovascular procedures

VesselNavigator is Philips next generation image fusion technology, which uses a pre-operative CT or MR dataset as a 3D roadmap overlay on a live X-ray image. With its excellent visualization, VesselNavigator provides an intuitive and continuous 3D roadmap to guide clinicians through vasculature during the entire procedure. This reduces the need for contrast enhanced runs to create conventional roadmaps.

Reduces contrast medium usage and X-ray dose

After performing a number of minimally invasive endovascular procedures with the support of VesselNavigator, surgeons at the hospital are reducing their contrast medium usage – especially during iliac, aortic, and carotid procedures.

Although it is too soon to cite actual numbers, Prof. Dr. Vermassen says, "We are using less and less contrast because we know we can trust the roadmap image we are seeing. This 3D roadmap overlay is created right at the tableside, without any additional contrast-enhanced run because it is based on a preoperative CTA or MRA dataset. You can also change projections during the procedure without having to stop and do a new contrast run to create another roadmap. So we save contrast and X-ray dose every time we change position."

"VesselNavigator also enables reduction of contrast usage because it allows you to identify the ideal projection angles to visualize the side branches. In endovascular aneurysm repair (EVAR) for instance it is very useful to determine the optimal C-arm angulations so that the stent graft can be deployed as accurately as possible near the lowest renal artery or to visualize the origin of the hypogastric arteries."

"The system allows you to determine these projections beforehand, save the projections and with one push on a button the C-arm will automatically go to the desired position. The roadmap will automatically adapt itself to the new projection without having to perform additional angiograms. This not only enhances your planning accuracy since it uses a 3D roadmap, but also saves the time needed to perform the contrast injections and search for the right C-arm positions."

Reducing contrast and radiation is important, not only for the endovascular team but also for the patient. "Patients can develop allergies to contrast medium and it can have side effects on the kidneys."

Reducing radiation is also becoming more and more important for the surgeon," says Prof. Dr. Vermassen. "VesselNavigator gives us the possibility to improve our guidance during procedures and it can also help us reduce our radiation exposure to staff and patients."

Improves guidance

The ring markers are a very useful feature for marking the ostia, landing zone, and other areas of interest. Dr. Moreels says, "You can place a marker at the bifurcation to guide you during cross-over procedures. I also used the markers in another way in a recent procedure. The patient had an endoleak which could not be detected on angiography. We just put a marker on the CT image and it then showed up on the fusion image so we could see where it was as we worked."

"We used to make several angio runs to get the right projection to see the ostia. Now we can explore all C-arm positions beforehand and determine the optimal angles. We are now doing almost an entire procedure without administering additional contrast. We just do a contrast run at the start and end and that saves a tremendous amount of contrast and X-ray dose."

Dr. Nathalie Moreels, MD, Vascular Surgeon



VesselNavigator roadmap image with markers used during an EVAR procedure at Ghent University Hospital



VesselNavigator roadmap image with markers used during a left common carotid stenting procedure at Ghent University Hospital

It just speaks for itself

Learning this new tool went surprisingly smoothly for all involved. Prof. Dr. Vermassen says, “It surprised me how quickly we were able to use it, after just a few cases. Even the surgical nurses who had never seen it before started using it very quickly, without any extra training.”

Prof. Dr. Vermassen adds, “I was pleasantly surprised by the workflow. It just speaks for itself. The 2D registration is done in a few seconds, and is accurate enough to see the path. It’s also very useful to be able to adapt the fusion image right at the table.”

“I was a bit afraid that VesselNavigator would be really hard to learn. But it went really easily.” says Dr. Moreels. “The buttons are logically placed and everything goes in clear steps. You don’t get too much information, just what you need to be able to work with it.”

Mia Geenens, Lead Vascular Nurse agrees, “A lot of times these systems are very complex to learn, but VesselNavigator is very accessible and user friendly. It went much faster than I expected. Even during more complex endovascular procedures, we found it easy to manage the different functions. I’m really happy that we could master it in such a short amount of time, and it’s now a big plus for our procedures.”

A huge step forward in procedural efficiency

Prof. Dr. Vermassen says, “VesselNavigator is a huge step forward compared to conventional image fusion techniques. We found it faster, easier, and more intuitive. Philips has succeeded in creating an efficient workflow that makes it possible to use 3D image guidance quickly during the procedure without interfering with what you are doing. It is one of the easiest ways that I know of to see and mark blood vessels, yet reliable enough for the task you are doing.”

“With any innovation like VesselNavigator, you always have to consider the trade-off between how much you have to invest in time and effort and the benefit you get out of it. This equation is definitely in our favor with VesselNavigator,” concludes Prof. Dr. Vermassen.

Images are courtesy of Prof. Dr. F. Vermassen, Thoracic and Vascular Surgery Department, Ghent University Hospital, Ghent, Belgium. A limited release version of VesselNavigator was used for the procedures at Ghent University Hospital referenced in this article.

VesselNavigator is not available for distribution in the USA.

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