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IntelliSpace Portal

Customer story

Toyohashi
Heart Center

Who?
Dr Masanori Yamamoto, Chief Physician for Cardiovascular Medicine, and **Mr Shimizu**, Technician

Where?
Toyohashi Heart Center, Toyohashi, Japan

- Specialist hospital for cardiovascular disease, cardiovascular surgery and internal medicine
- Provides intervention therapy for structural heart disease (SHD)
- 130 beds in total
- Gained TAVI accreditation in January 2014

Challenge?
Accelerate the pre-TAVI analysis and sizing process for faster, more informed clinical decisions

Solution?
Philips IntelliSpace Portal with CT TAVI Planning

Fast, decisive pre-surgery analysis

CT TAVI Planning at the Toyohashi Heart Center

Transcatheter aortic valve implantation (TAVI) has become a key treatment option for aortic valve stenosis. But to establish whether the procedure is viable, clinicians must first perform CT scans to obtain anatomical measurements, such as the pulmonary valve ring diameter. To support this process, the Toyohashi Heart Center uses CT TAVI Planning, a clinical application on the Philips IntelliSpace Portal advanced visualization platform.

In the past, staff at the Toyohashi Heart Center faced several challenges when it came to assessing patient suitability for TAVI procedures. Chief among these was the amount of time needed for outpatient assessments. Previously, assessment, analysis and interpretation could take several hours, during which time the patient was unable to leave the facility.

The introduction of IntelliSpace Portal with CT TAVI Planning greatly accelerated this process. Clinicians can now interpret CT scans far more quickly at our hospital to determine whether a TAVI procedure is viable. In our experience, device sizing, too, now happens far faster than ever before – ultimately benefiting both medical staff and patients. And when you consider the potential of TAVI to enhance patient outcomes, it is easy to see why the CT TAVI Planning solution has proven so successful.

Time is of the essence

Dr Masanori Yamamoto, Chief Physician for Cardiovascular Medicine at the Toyohashi Heart Center, explains how TAVI Planning has supported him and his team.

Q: Can you please tell us how TAVI is currently used at the Toyohashi Heart Center?
Once the institution gained accreditation, we performed a total of 119 TAVI procedures between February 2014 and July 2016. More than 50 of these were done at Nagoya Heart Center, an affiliated institution. Currently, around one or two TAVI procedures are performed each week. Numbers like these provide ample evidence for TAVI. And if we consider the ageing population and wider insurance coverage, I expect that figure to increase.

119 TAVI procedures
performed between February 2014 and July 2016 at the Toyohashi Heart Center

Dr Masanori Yamamoto

Q: How do you and your colleagues plan TAVI procedures?
"Planning is generally recognized as the most important step in the TAVI process. There is a direct link between planning errors from the use of CT scans and the failure of TAVI procedures. There are also techniques for device sizing, such as PCI, in the same way as TAVI. I think device sizing is particularly important for TAVI, as it is a matter of life or death for patients."

Device sizing measurements performed for TAVI procedures require high accuracy and reproducibility. Consequently, when first performing TAVI, a great deal of technique and training is needed to perform measurements manually. At first, just I and two radiographers performed device sizing, comparing and adjusting our results, and each case took around an hour.

Q: How did device sizing change, after the introduction of CT TAVI Planning with the IntelliSpace Portal?
Firstly, CT TAVI Planning greatly reduced the time we spent on device sizing. Of course, as we gained experience and expertise, we needed less time to perform it manually – but even then, CT TAVI Planning helped us complete the task quickly.

The greatest advantage is that during outpatient visits, we can quickly interpret CT scans to determine whether TAVI is viable. In the past, we would keep patients waiting, only to have to explain on their next visit that TAVI would not be suitable for them.

Patients may deteriorate before their next examination, so I think it is really important to provide a fast therapeutic option for patients who don't have time to wait. CT TAVI Planning delivers fast, confident measurement results, so it helps us deliver rapid support to the patients who need it most.

Moreover, CT TAVI Planning can search for and measure the pulmonary valve ring surface automatically. This means many staff members can now participate in device sizing, even if no highly experienced specialists are present. As a result, we can handle a higher number of cases, including more emergencies.

An intuitive system that enables anatomical modeling

Mr Shimizu is a medical radiographer in the hospital's radiology department. His tasks include performing various preparatory tasks prior to TAVI surgery.

Mr Shimizu, Technician

Q: What are your impressions of using automatic segmentation, a feature of CT TAVI Planning?
Segmentation is completely automatic, though I like the fact that determining each face is not fully automated. CT TAVI Planning indicates the recommended location for coronary artery origin and pulmonary valve ring surface, and I can confirm and fine-tune those recommendations. This feature is particularly helpful in cases where there is valve calcification.

Furthermore, if the pulmonary valve ring and left and right coronary artery origin are matched, the software helps automatically determine locations such as the Valsalva sinus and ST junction.

Q: To date, have you had any cases where it was difficult to work with CT TAVI Planning?
We haven't had any unmanageable cases since we started using it. For example, we could complete our analysis without any problems even in cases with unfavorable CT results, where the contrast medium amount was limited because of poor renal function.

Q: Which cardiac phase is used in actual device sizing?
Basically, we use systolic and diastolic. It's important to perform measurement in an open valve condition and without blurring of the pulmonary valve ring. Consequently, we use CT TAVI Planning for nearby phase expansion and contraction, according to the case.

Q: How is the optimal catheter angle one of the key functions of CT TAVI Planning?
We definitely use this function. Firstly, we take a perpendicular view with the pulmonary valve and C-arm at a right angle, and set and confirm the C-arm angle acquired using CT TAVI Planning. The perpendicular view can be acquired with the nearest angle, or using the angle actually acquired with the software.

CT TAVI Planning flow

Confirmation of five segment points

Confirmation of five created surfaces

Confirmation of recognized contours

Assessment of vascular access route

Measurement results

IntelliSpace Portal with CT TAVI Planning
a powerful combination

IntelliSpace Portal
This multi-modality workstation is capable of analysis using CT, MR, AMI, US, iXR and DXR scans. It can be equipped with over 70 clinical applications centered on diagnostic areas such as cardiology, neurology, and oncology. IntelliSpace Portal 9.0 is a comprehensive advanced analysis solution that provides a broad view of your patient designed to optimize diagnosis. Combining clinical acuity and workflow efficiency, IntelliSpace Portal 9.0 delivers the advanced visualization capabilities you need.

The Toyohashi Heart Center has two clients in the CT room, one i an environment capable of analysis in multiple rooms, including at the point of care.

CT TAVI Planning
Aorta /Aortic Root/LV/RMCA Ostium/RCA Ostium anatomical information (location, shape) is recognized automatically on startup using the anatomical modeling of CT TAVI Planning. Using this location information, the software can automatically measure the five cross-sections required for TAVI measurement, such as blood vessel diameter. A total of 23 measurements are made automatically (21 distance, 1 area, 1 angle), and the user only needs to confirm or revise the identified location points.

> **“ CT TAVI Planning greatly reduced the time we spent on device sizing”**
>
> **Dr Masanori Yamamoto**
> Chief Physician for Cardiovascular Medicine,
> Toyohashi Heart Center

To explore how CT TAVI Planning and IntelliSpace Portal can benefit your facility, please contact your local Philips representative.

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