



# The role of ultrasound during a **MitraClip** procedure

**ACUSON SC2000 ultrasound system**

Courtesy of Dr. Lissa Sugeng, MD, MPH and Rachel Kaplan, RDCS,  
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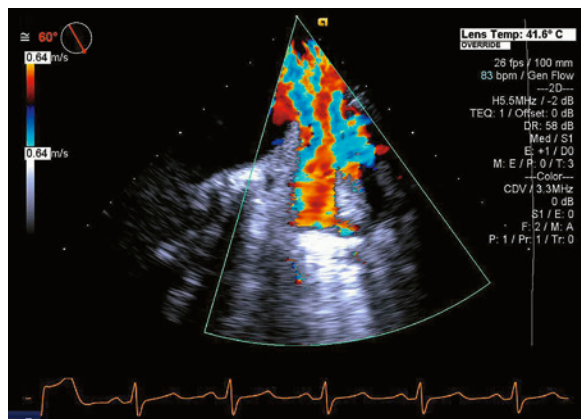
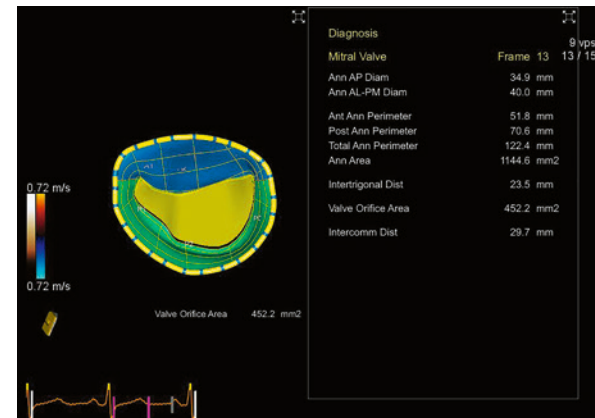
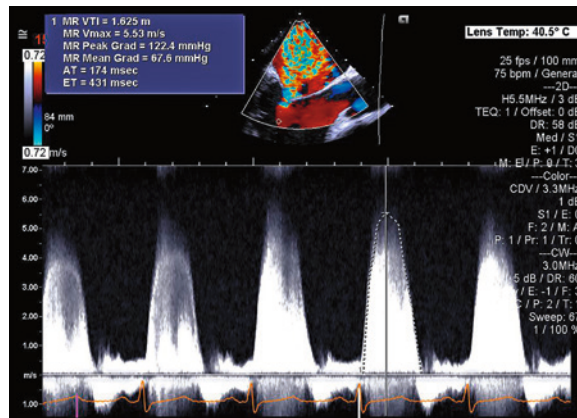
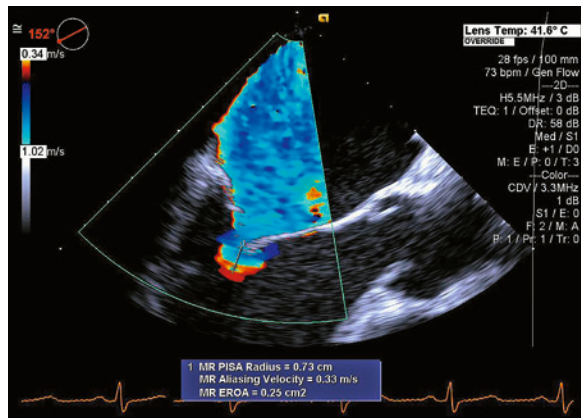
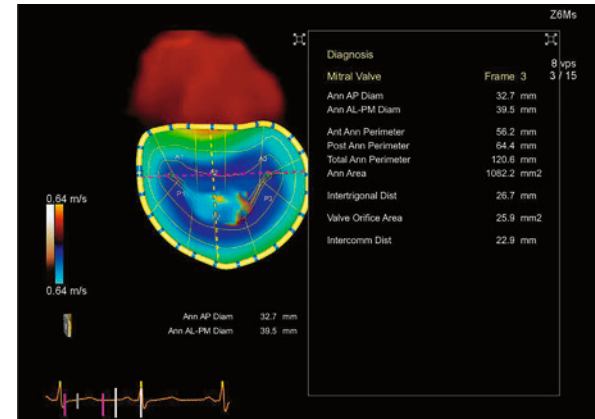
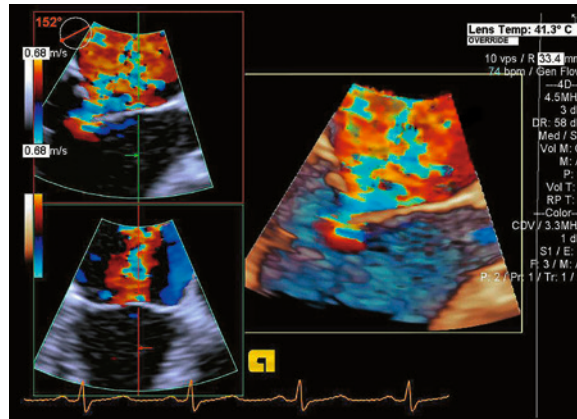
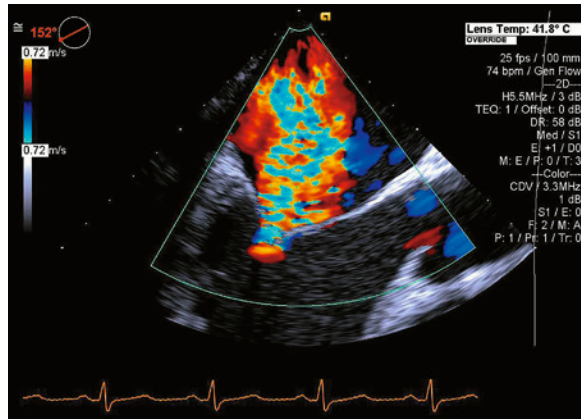
**Clinical  
Case Study**

## Clinical Case

A 65-year-old male who was previously diagnosed with severe mitral regurgitation was seen at Yale-New Haven Hospital, Connecticut, USA. The indication was mitral clip procedure.

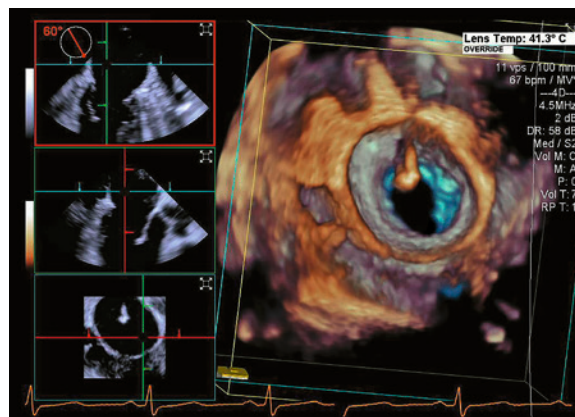
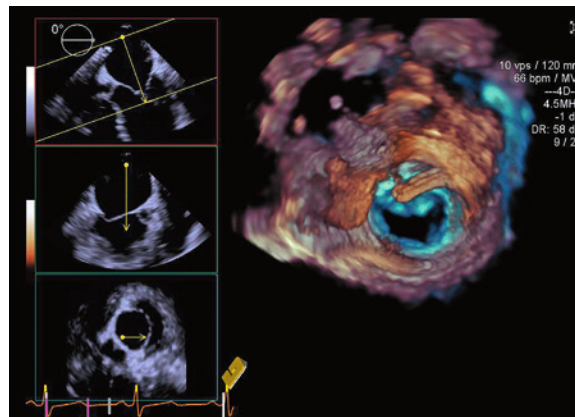
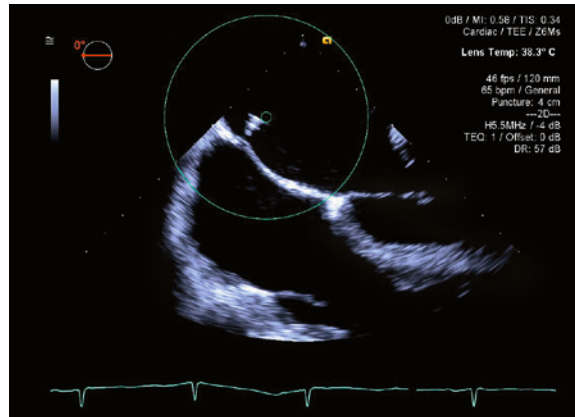
## Pre-Procedure

The baseline transesophageal echocardiography (TEE) exam shows severe mitral regurgitation (MR) with two jets. The effective regurgitant orifice (ERO) area by proximal isovelocity surface area (PISA) using 2D transthoracic echocardiography (TTE) is 0.25 cm<sup>2</sup>. The MR mean gradient is 67.6 mmHg. 3D modeling of mitral valves using the eSie Valves analysis package was also performed. Also, systolic flow reversal is seen in the pulmonary veins.



# Trans-Septal Puncture

Septal guide provides real-time guidance when crossing the septum. Catheter positioning can also be seen with real-time full volume imaging using the D'art navigation tool.

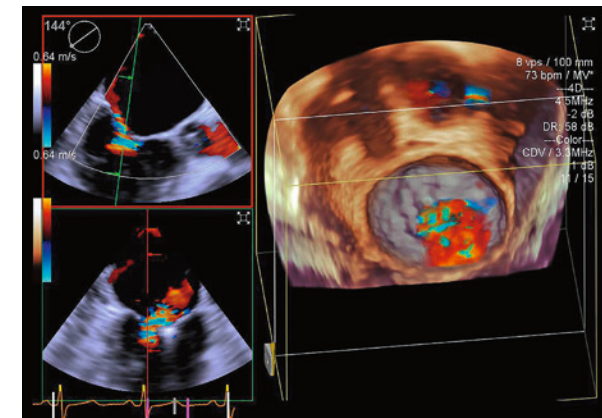
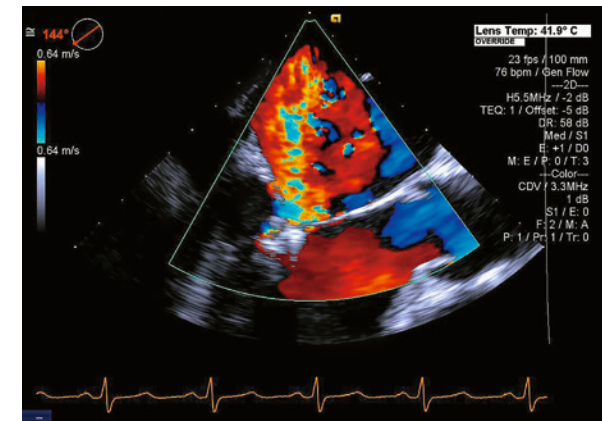
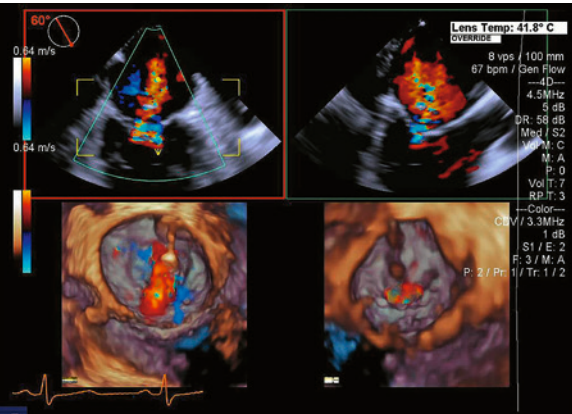
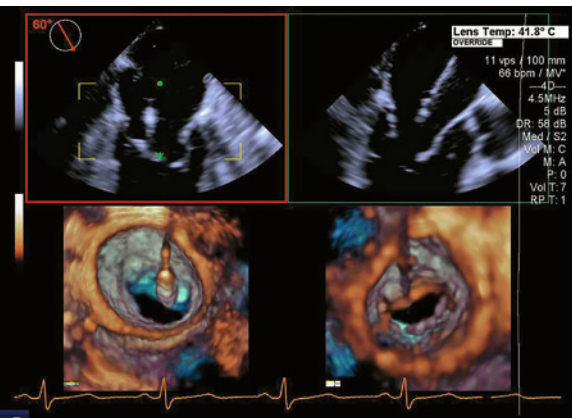
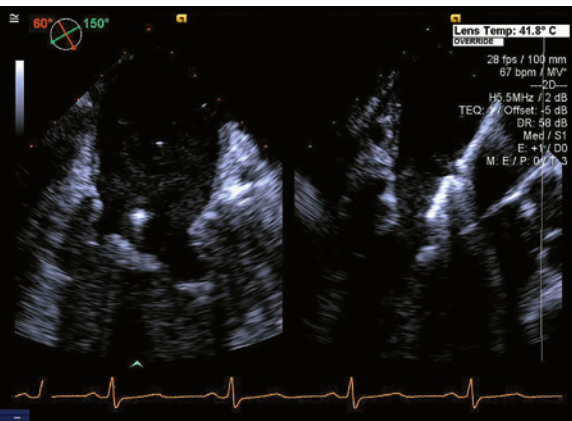


## 1<sup>st</sup> MitraClip Pre-Deployment

The MitraClip® crosses the mitral valve and grasps the anterior and posterior leaflets. A 3D visualization of the device is possible in real-time from both ventricular and atrial perspectives using Dual V. Additionally, real-time regurgitation can be observed using volume color Doppler.

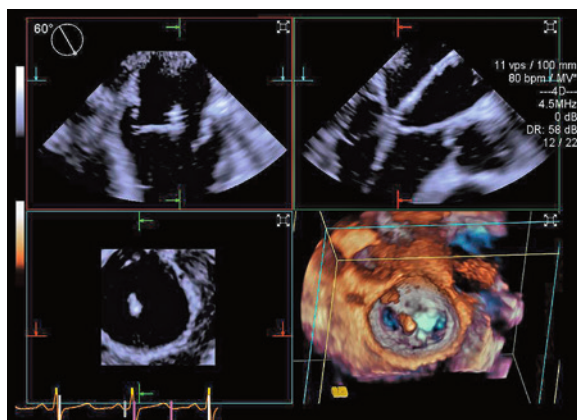
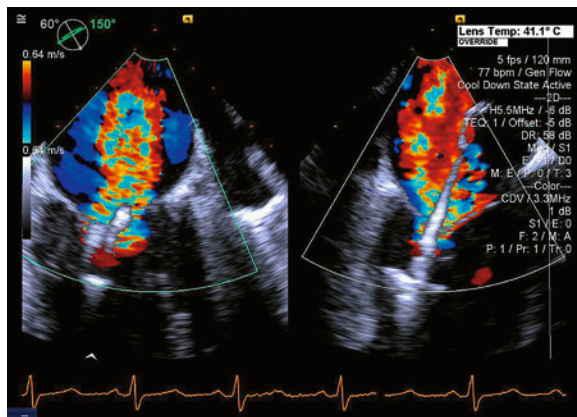
# 1<sup>st</sup> MitraClip Post-Deployment

After deployment of the first clip, significant residual mitral regurgitation can be observed in 2D and real-time 3D with volume color Doppler. It is determined that a second MitraClip is needed.



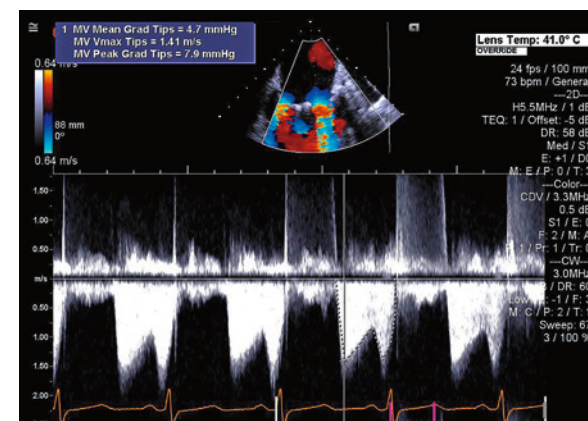
## 2<sup>nd</sup> MitraClip Pre-Deployment

The second clip is positioned, and grasps the anterior and posterior leaflets with confirmation by real-time full volume imaging and volume color Doppler.



## 2<sup>nd</sup> MitraClip Post-Deployment

The second MitraClip is placed on the P2-A2 segment. As a result, there are two orifices with a mean gradient of 4.7 mmHg. The mitral valve 3D model obtained in one click shows the valve orifice area post-clip using the eSie Valves package. Significant reduction in mitral regurgitation is observed. No pulmonary vein flow reversal is observed.



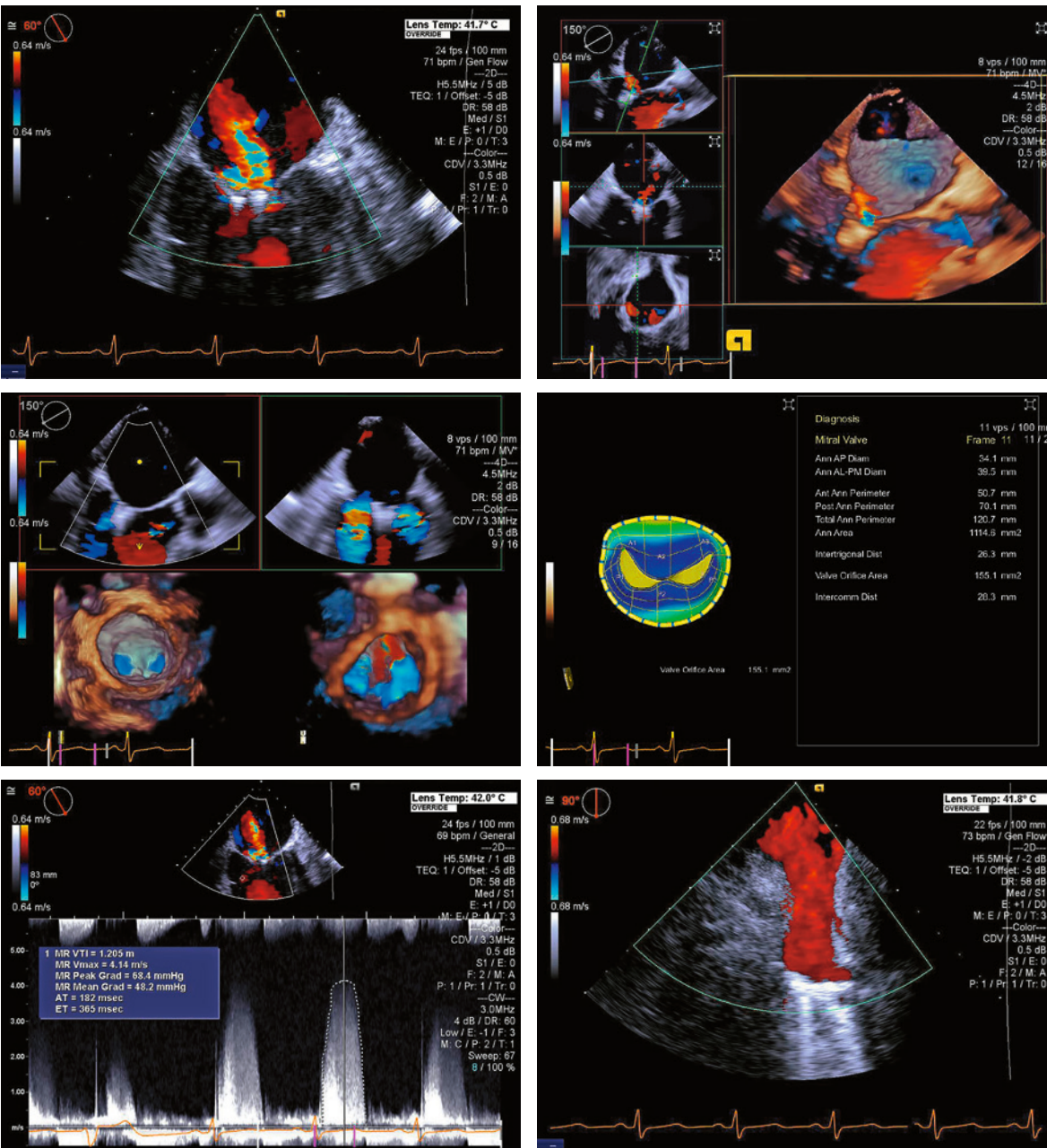
# Results

The true volume TEE transducer (Z6Ms) on the ACUSON SC2000 defines the leading edge of 4D imaging with high volume rates and real-time continuous imaging.

During pre-procedure the ACUSON SC2000 was able to accurately and efficiently quantify MR with 2D PISA analysis and model the mitral valve in one click with eSie Valves package. During this MitraClip procedure, the physicians were able to see the regurgitation in real-time without stitching. Crossing the septum was easier using the septal guide that provided real-time navigation.

After deployment of the first clip, it was determined that there is a need for a second clip in this case. After deployment of the second clip, satisfactory reduction in regurgitation was accomplished.

The true volume TEE transducer (Z6Ms) allows physicians to operate on a wider variety of patients due to better visualization of form, flow and function. During the procedure, physicians have better visualization in real-time available to them, helping them to have more confidence in determining the status of the procedure. The ability to see the heart in real-time and visualize the regurgitation before, during and after the MitraClip was deployed, may increase the success of a procedure.



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Standalone clinical images may have been cropped to better visualize pathology.

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MitraClip® is a trademark of the Abbott Group of Companies.

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# Correlation between CT and eSie Values for Transcatheter Aortic Valve Replacement

**ACUSON SC2000 PRIME**  
ultrasound system

Courtesy of Dr. Lissa Sugeng, MD, MPH and Rachel Kaplan, RDCS,  
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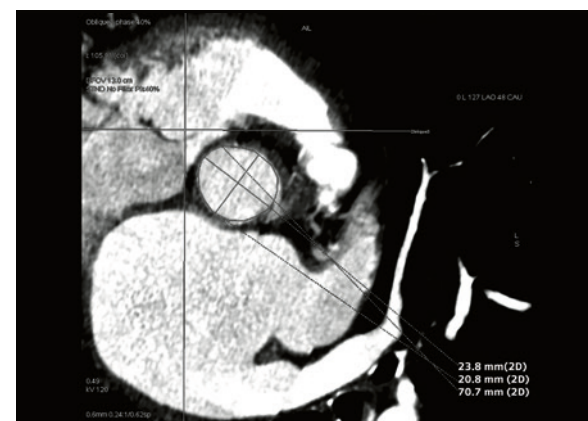
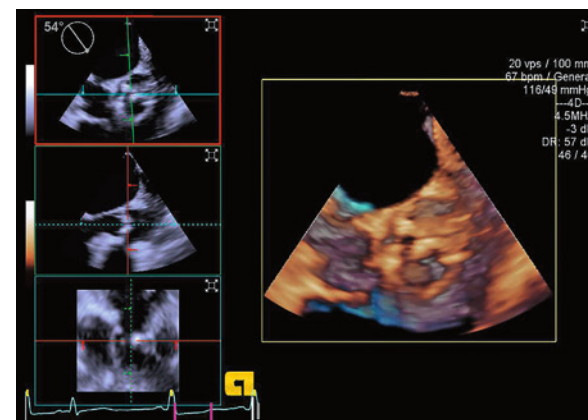
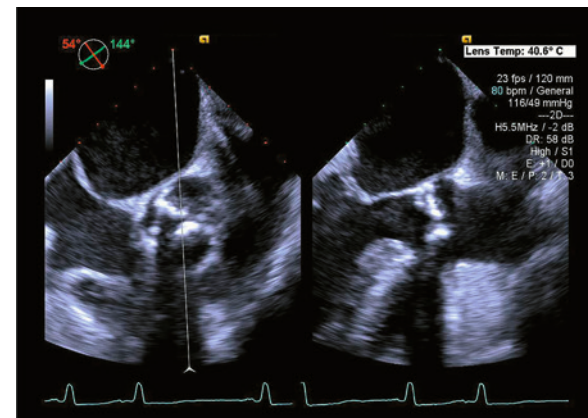
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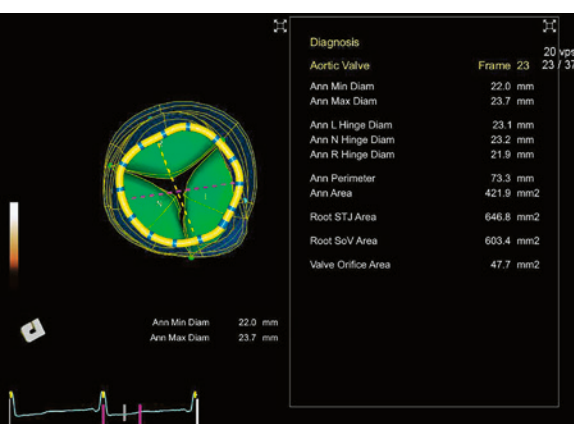
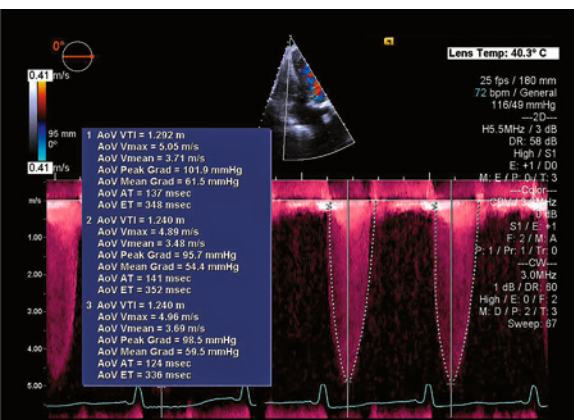
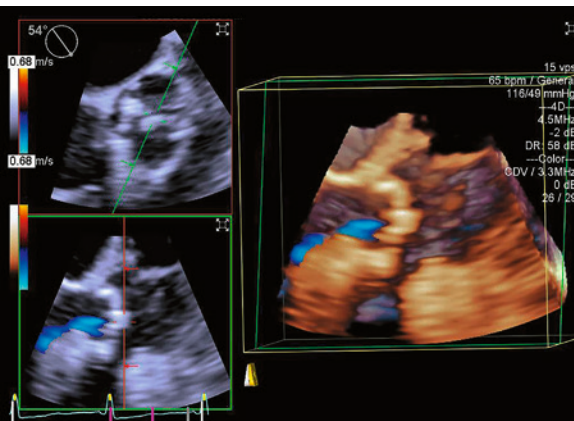
# Clinical Case

A 90-year-old female who was previously diagnosed with severe aortic stenosis was seen at Yale-New Haven Hospital, Connecticut, USA. The indication was Transcatheter Aortic Valve Replacement (TAVR) and the following procedure was performed in a hybrid OR utilizing both ultrasound and CT imaging.

## Pre-Procedure

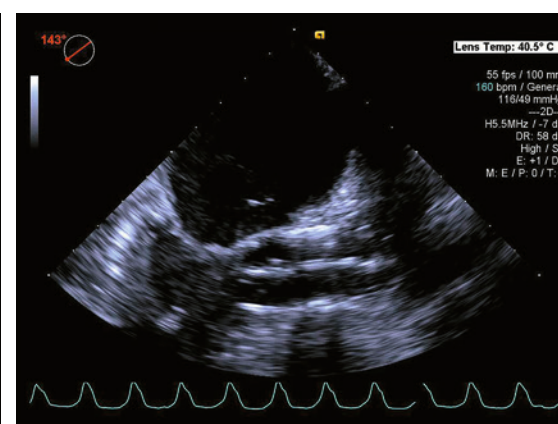
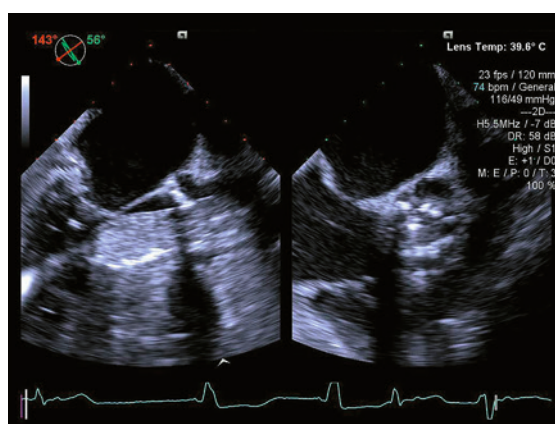
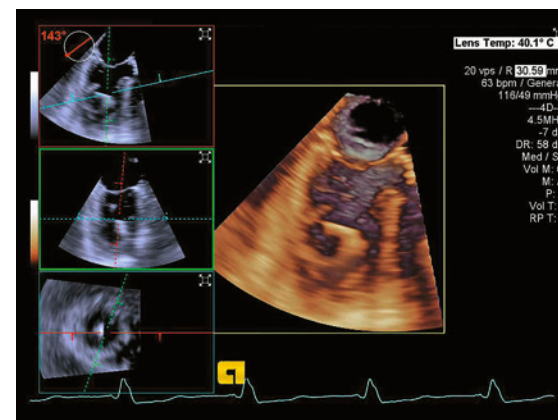
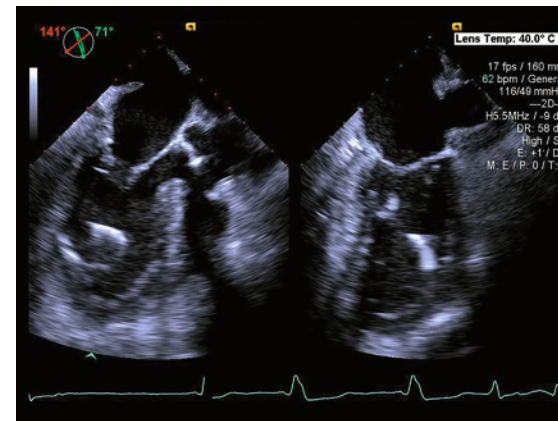
The baseline transesophageal echocardiography (TEE) exam shows the velocity through the aortic valve at 5 m/s and a mean gradient of 54 mmHg with aortic regurgitation. The aortic annulus' minimum and maximum diameter is 22 x 24 mm (mean diameter is 23 mm). The aortic annulus area is 422 mm<sup>2</sup> and the perimeter is 73 mm. Predicted aortic valve prosthesis size is 26 mm. Both CT and eSie Valves™ advanced analysis package with its automated modeling of aortic valve and root had strong correlation in measurements enabling greater confidence in the selection of correct prosthesis.





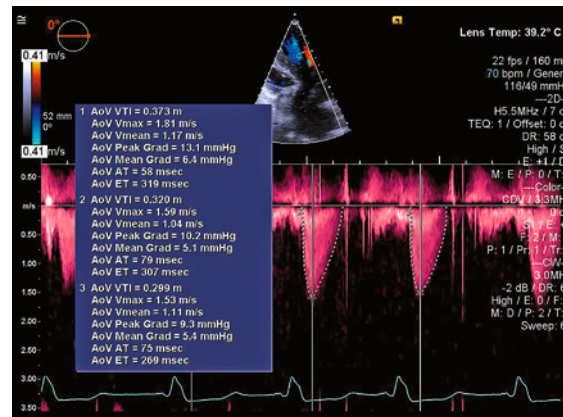
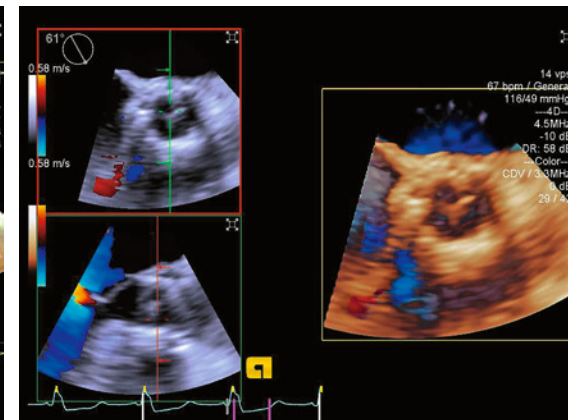
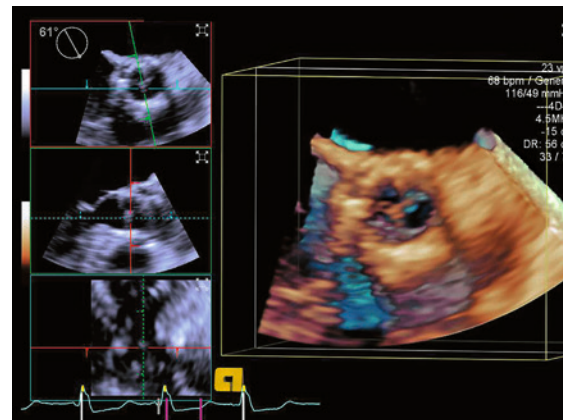
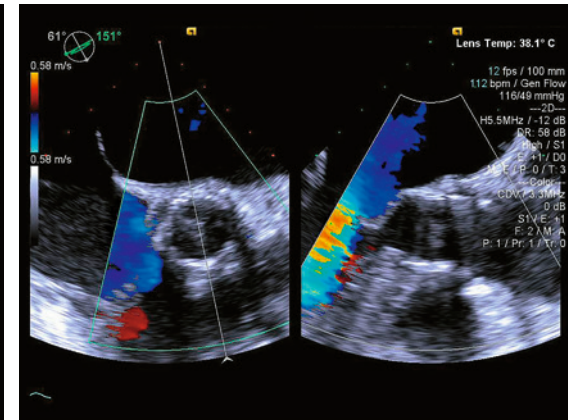
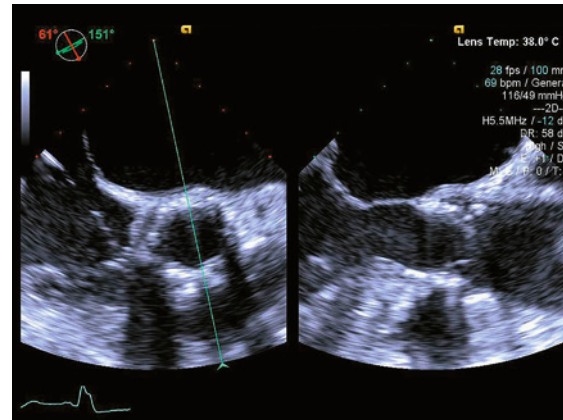
## Intra-Procedure

A balloon aortic valvuloplasty (BAV) is performed with a 10/5 nucleus balloon. The prosthesis was deployed under rapid pacing.



# Post-Procedure

In the post-deployment TEE exam, the bioprosthetic aortic valve appears to be well seated. There is no significant paravalvular leak and no valvular regurgitation. The aortic peak velocity is 1.5 m/s, the mean gradient is 4.2 mmHg. The estimated aortic valve area is 3.1 cm<sup>2</sup>.



# Results

The true volume TEE transducer (Z6Ms) on the ACUSON SC2000™ PRIME ultrasound system defines 4D imaging with real-time continuous imaging, high volume rates, and the eSie Valves package. Whether pre-procedure or during this TAVR procedure, performed in a hybrid OR, the physicians were able to use the eSie Valves package to quantify the stenotic aortic valve within seconds. The CT aortic valve minimum, maximum and perimeter measurements were nearly identical to the automated measurements obtained using echo with the eSie Valves package. This provided confirmation of the correct prosthesis size right before the deployment. The real-time visualization with true volume TEE and the accuracy of eSie Valves measurements both on the ACUSON SC2000 PRIME opens new possibilities for using echocardiography for both pre-procedure planning and procedural guidance during transcatheter procedures.



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