

Tricks and Tips for 3D Visualization: A Practical Approach to Use in Your Interventional Cases

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Disclosures

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- MSH UHN AMO Innovation Award
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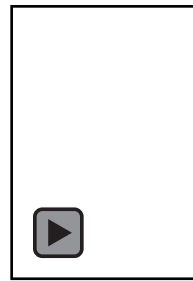
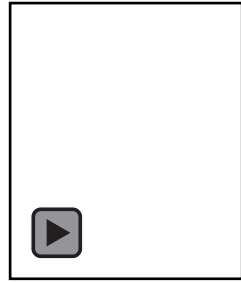
Honoraria:

- UptoDate

Outline

- To review 3D acquisition choices relevant to periprocedural imaging
- To present cases demonstrating the use of 3DE

1. Image Optimization




Interventional 3D Decision-making

2. Acquisition Modes

Single beat

- Zoom
- Narrow volume
- Wide volume

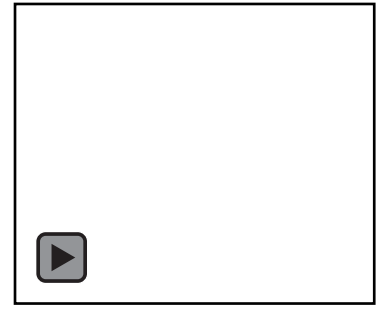
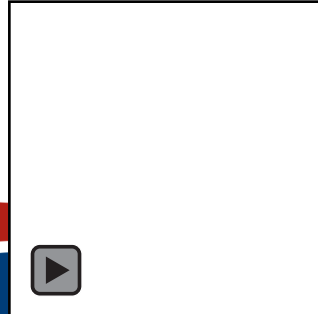
Spatial vs temporal resolution
Gating artifacts



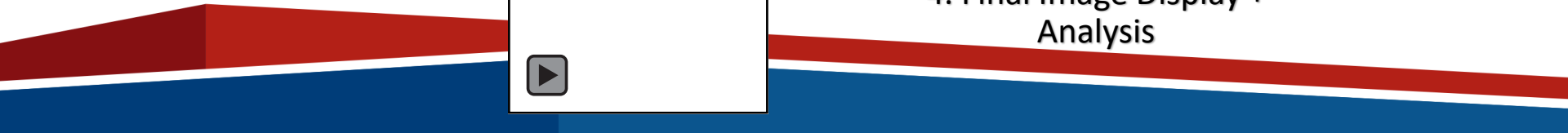
- Color Doppler
- Multi-beat

3. Rendering

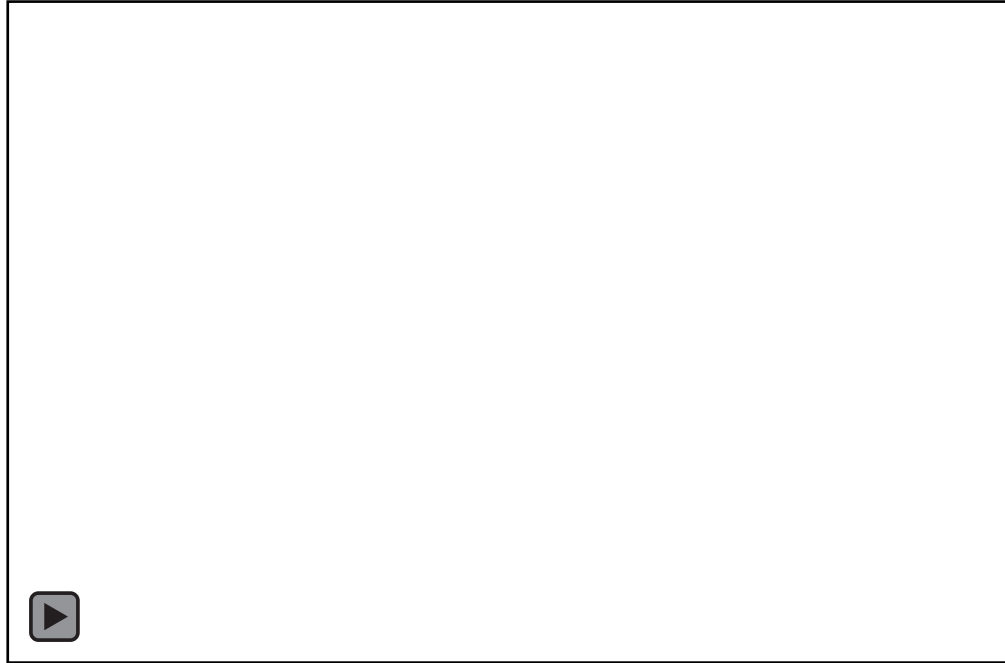
- Cropping
- Thresholds



4. Final Image Display + Analysis

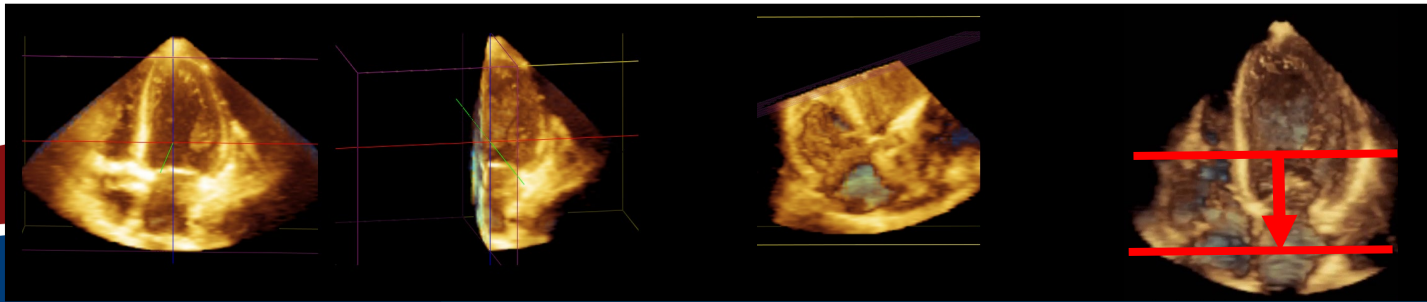
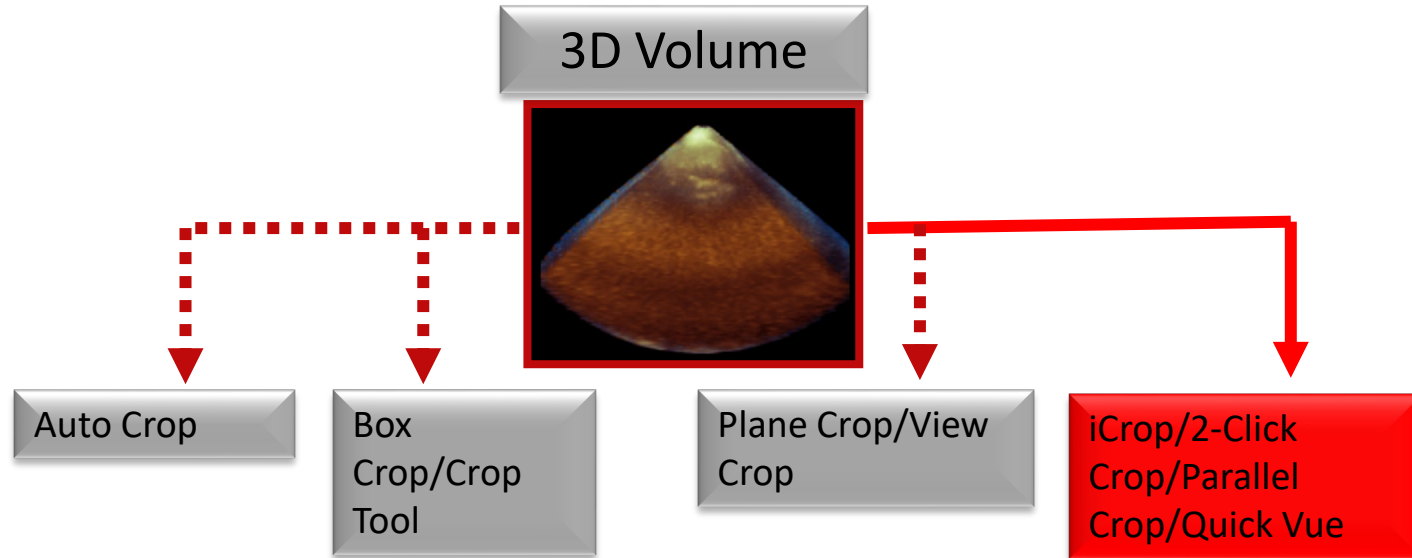


Sweep in 3DE

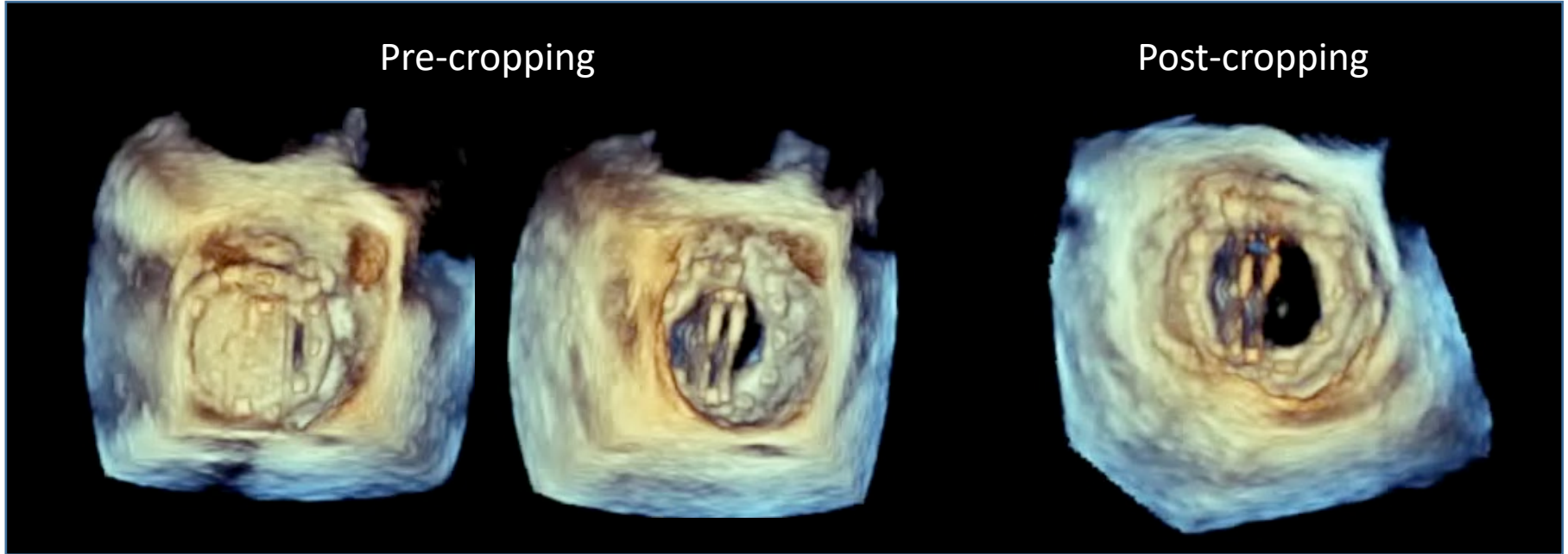


- Use when limited pyramidal size and single beat mode

Display: Cropping



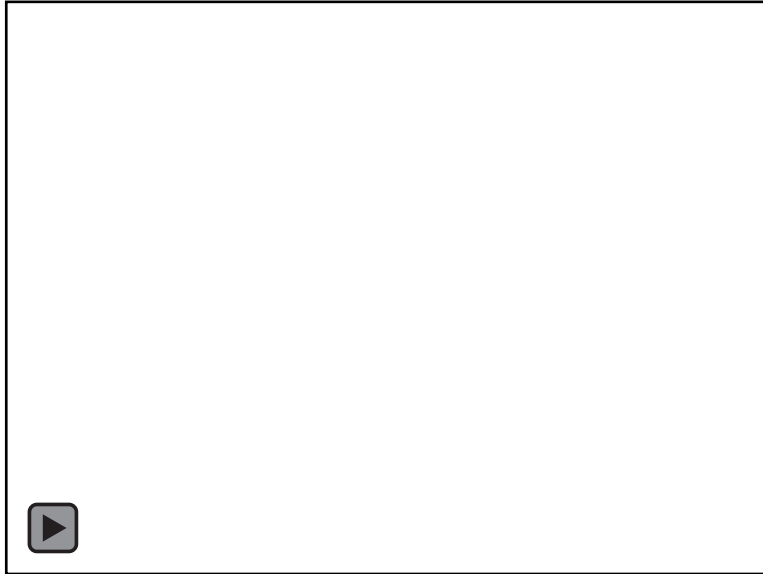
What a little cropping can do.....



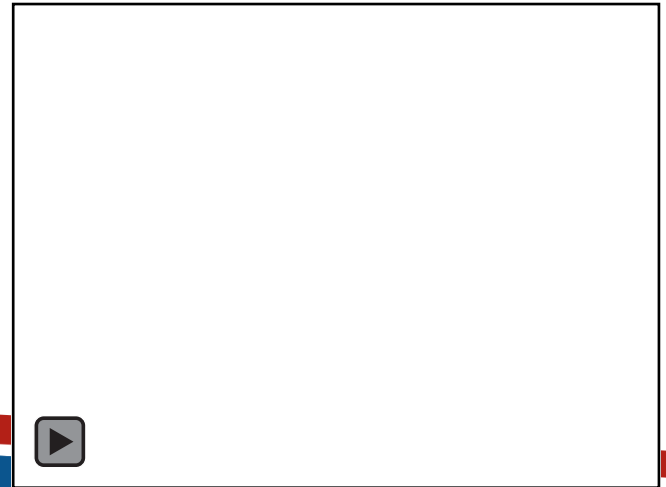
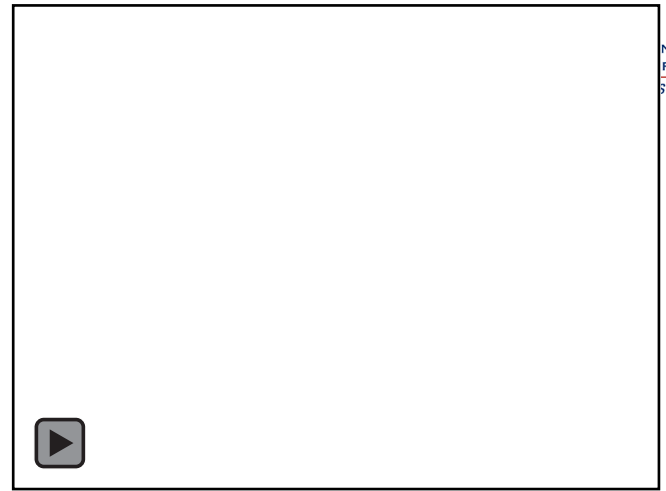
- Removal of a portion of the LA wall improves visualization of this prosthetic MV

Display: 3D Color

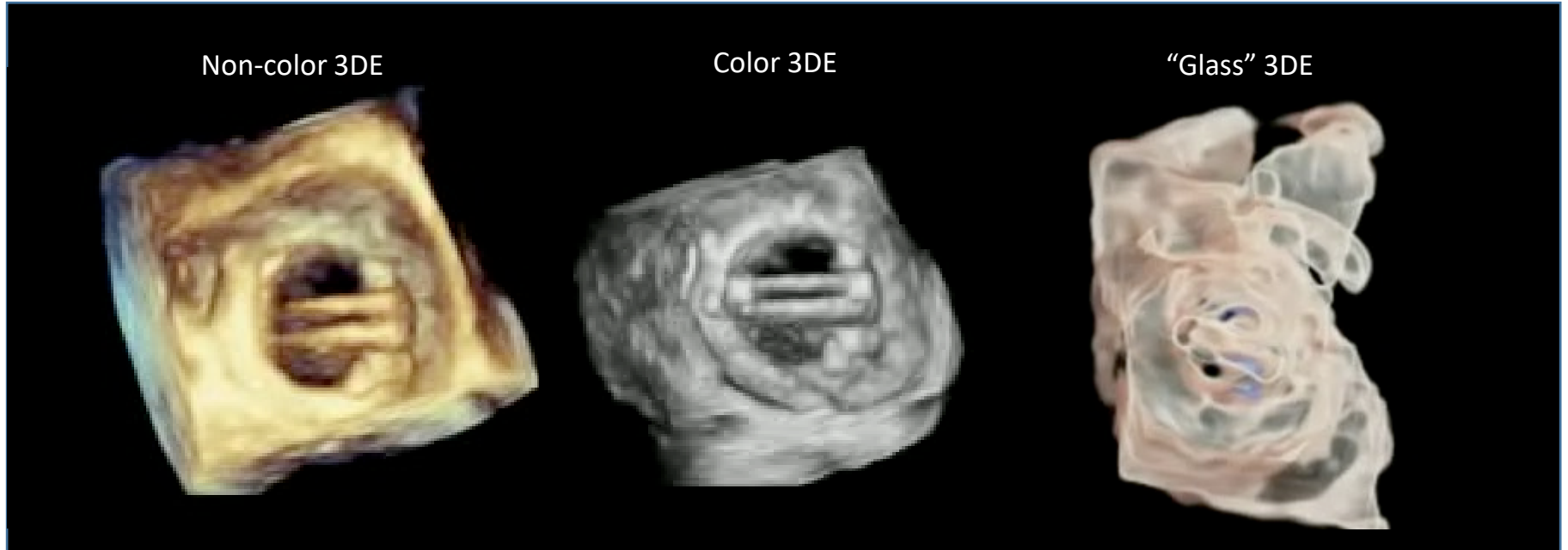
No Filter



- Quickly optimize by increasing the filter
- Note, smaller jets may be filtered out

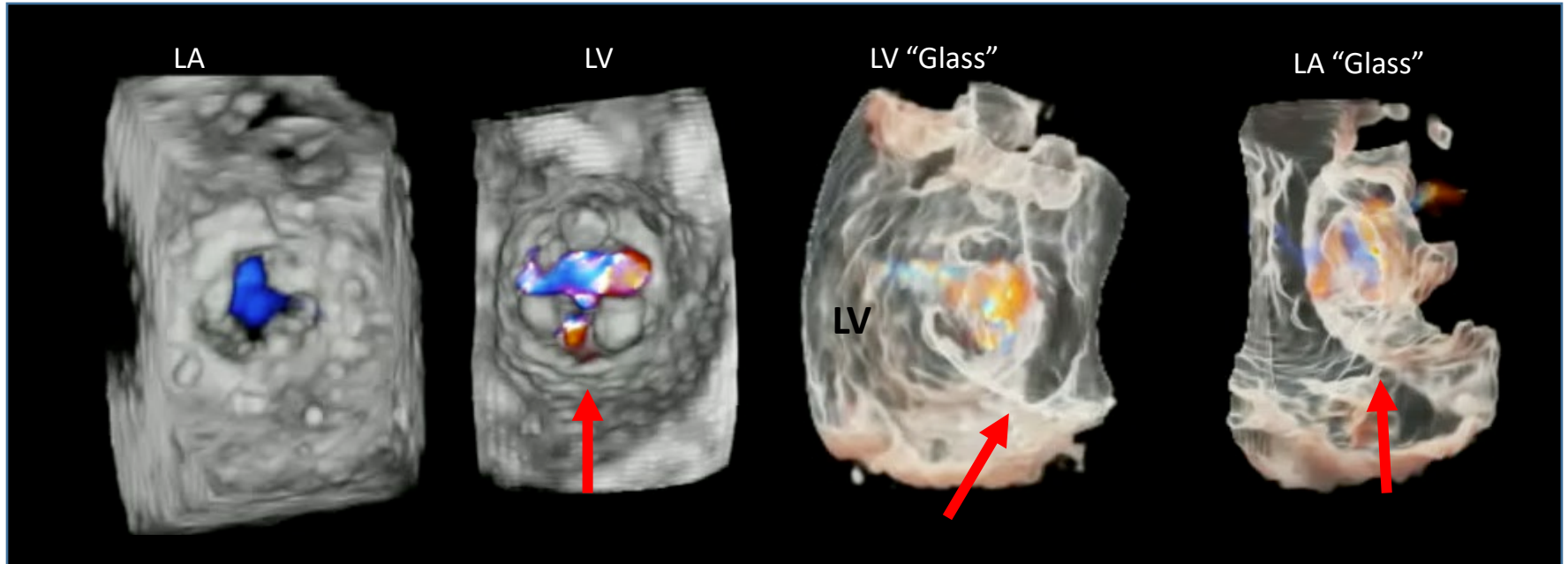


Display: Transparency/glass modes



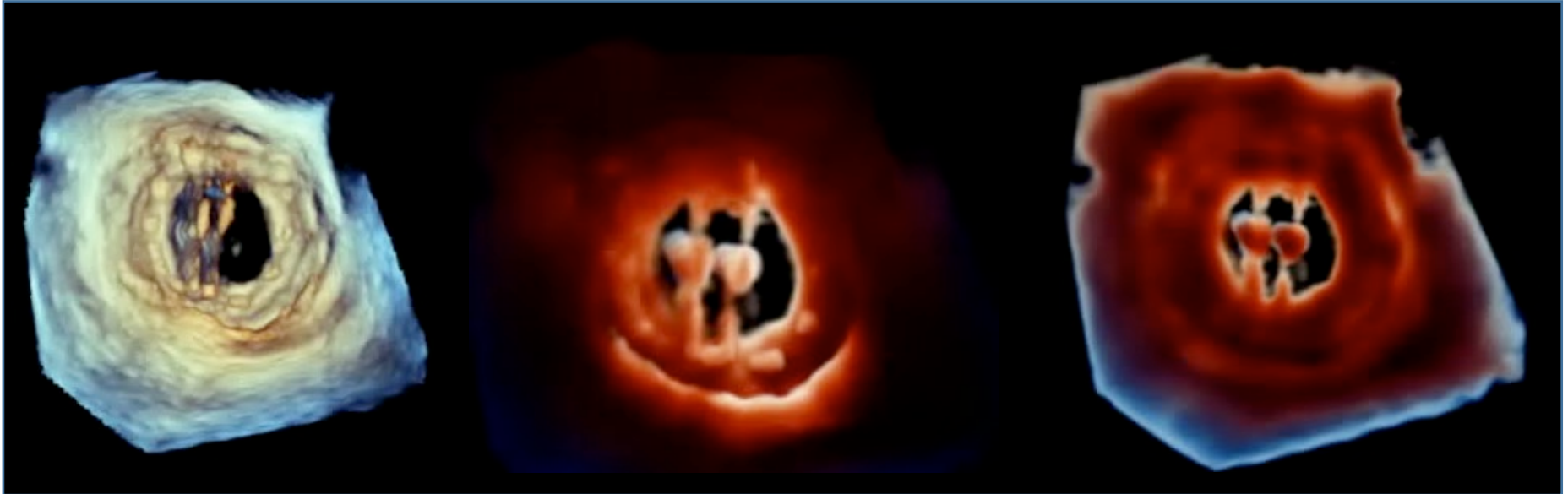
- Transparency/glass techniques can help visualization of the jet origin.

Display: Paravalvular Leak



- Visualization from the ventricular perspective and side-/off-axis views in this case allow appreciation of the valvular and paravalvular jets

Display: Transillumination and light positioning

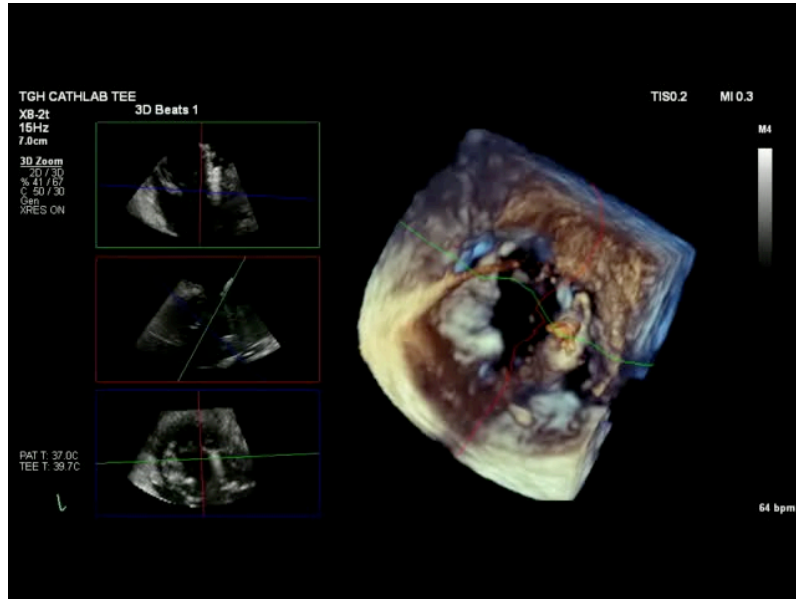


More central

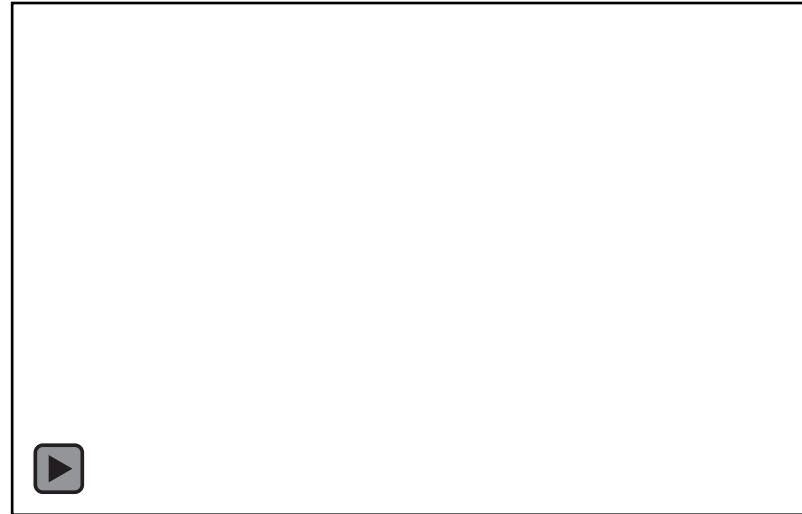
Behind the leak

Display: Fast Multiplane Visualization/Localization

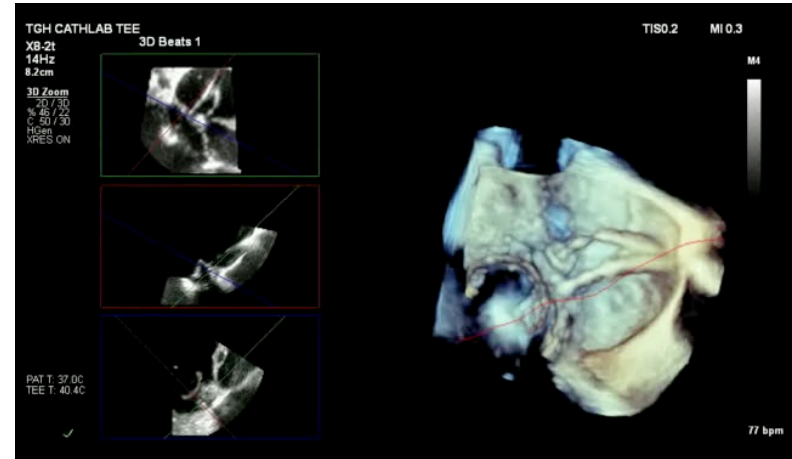
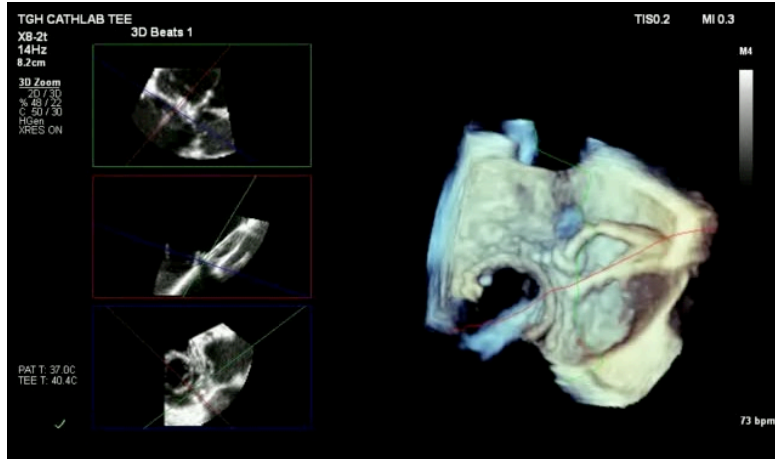
Philips - Multivue



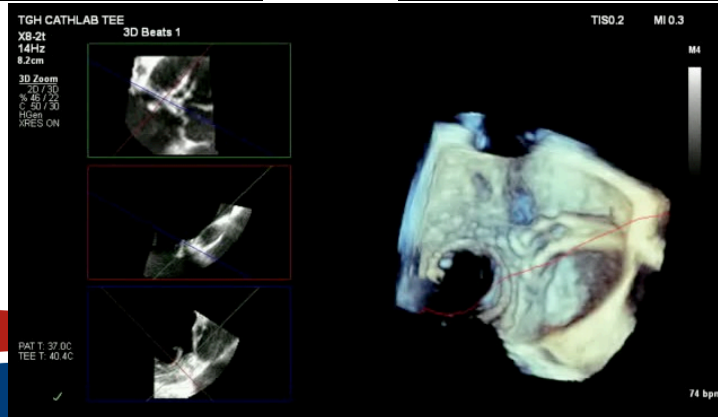
GE- Flexislice



Multiplane visualization



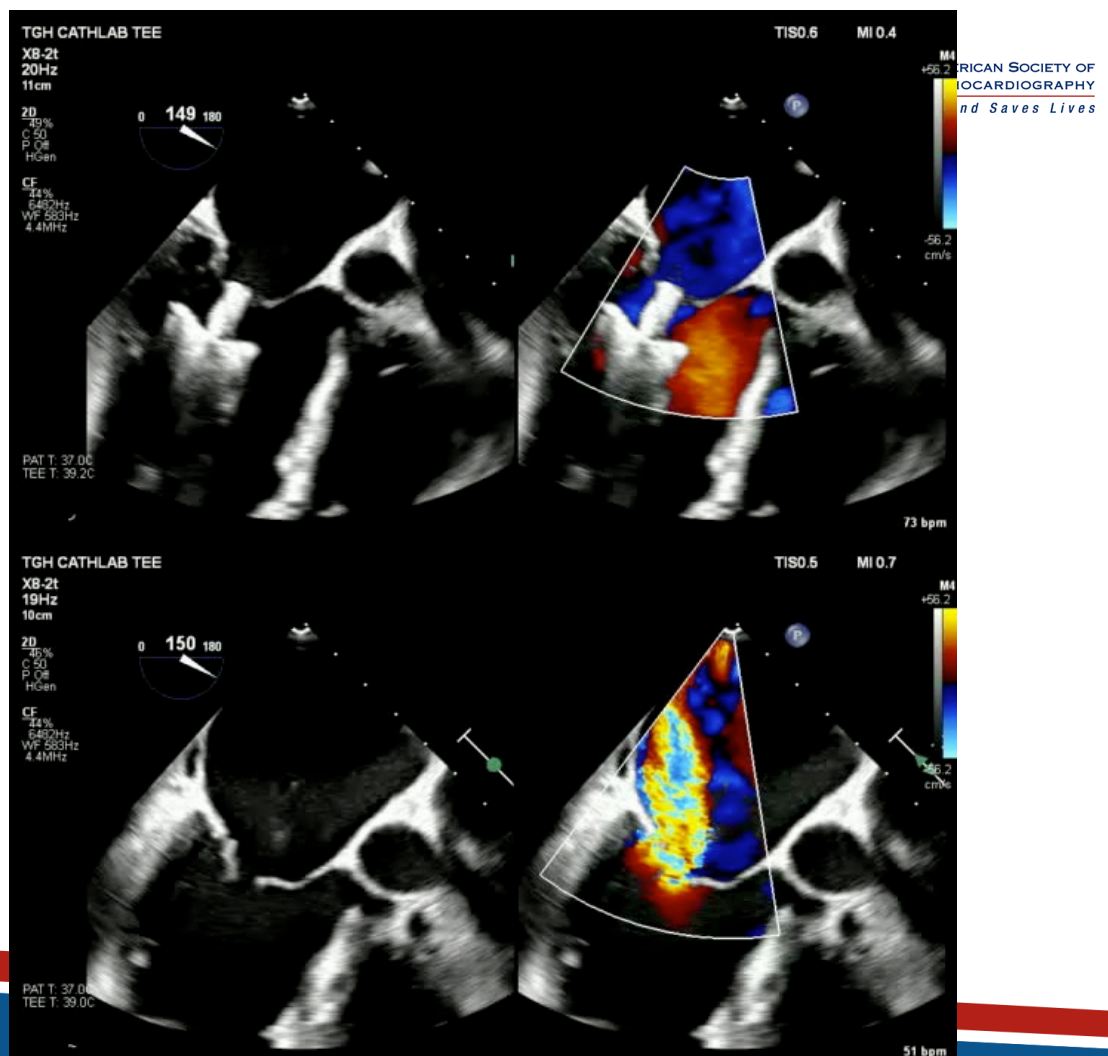
- Set up while the device is being prepared



CASE

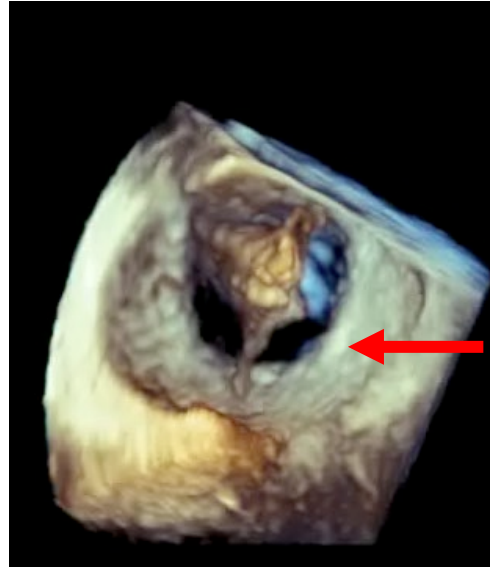
New MR during percutaneous edge-to-edge repair

- Post clip placement there was an increase in MR
- The clip was removed
- ? Source of MR
 - Flail/perforation?



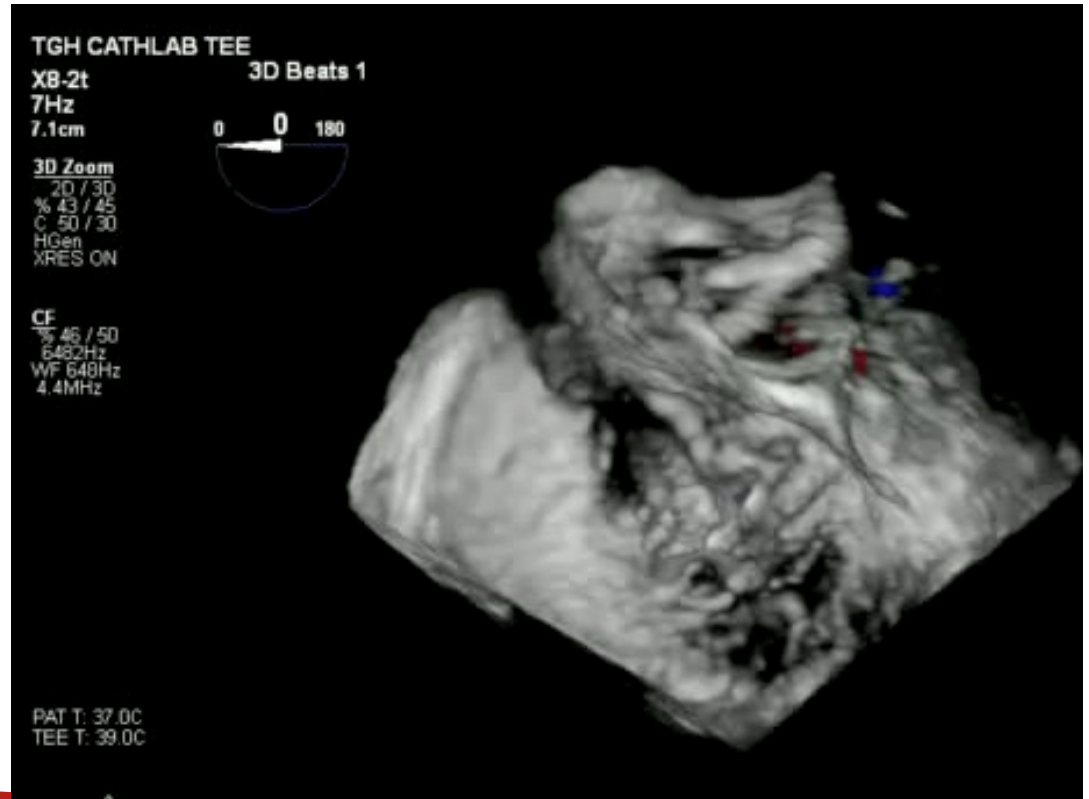
New MR during during percutaneous edge-to-edge repair

- 3DE allow visualization of the entire region
- Appears to be a perforation
- Transillumination clearly shows that there is a hole, but is this the source?



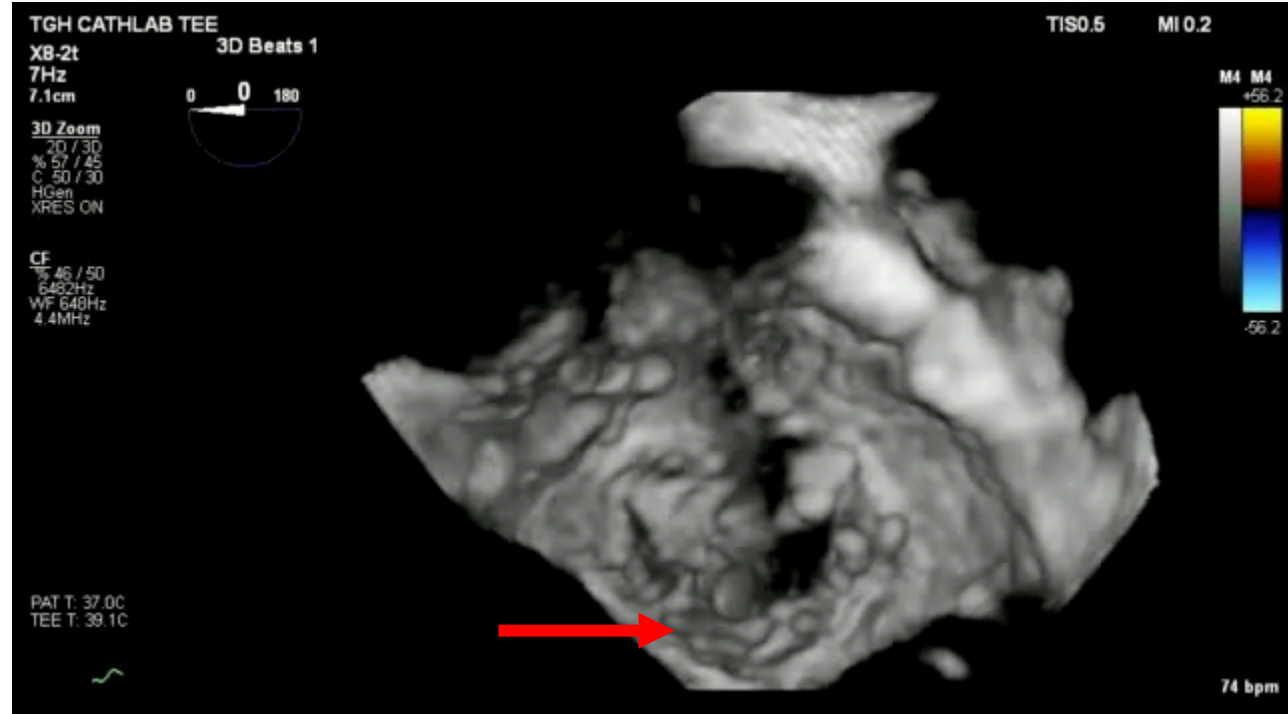
New MR during during percutaneous edge-to-edge repair

- Difficult to see the with the MR from the coaptation line.
- The image had a low frame rate because color was added to the previous 3D volumes
- Part of the pressure in the cath lab is to obtain needed info in a timely manner



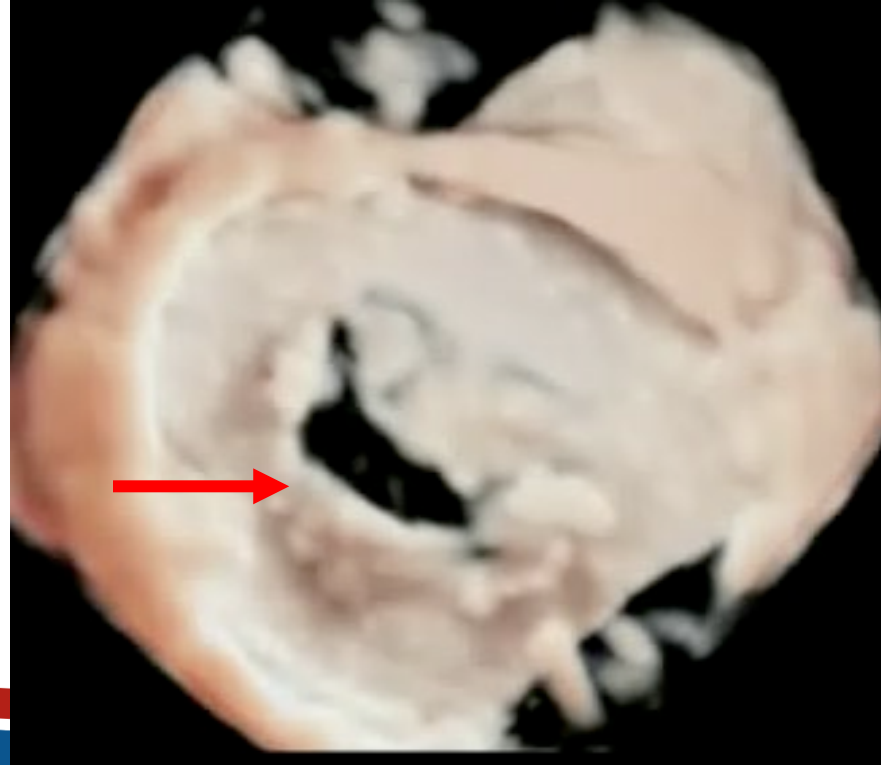
New MR during during percutaneous edge-to-edge repair

- Ventricular views with color can be helpful
- Identification of the PISA demonstrates two sources of MR

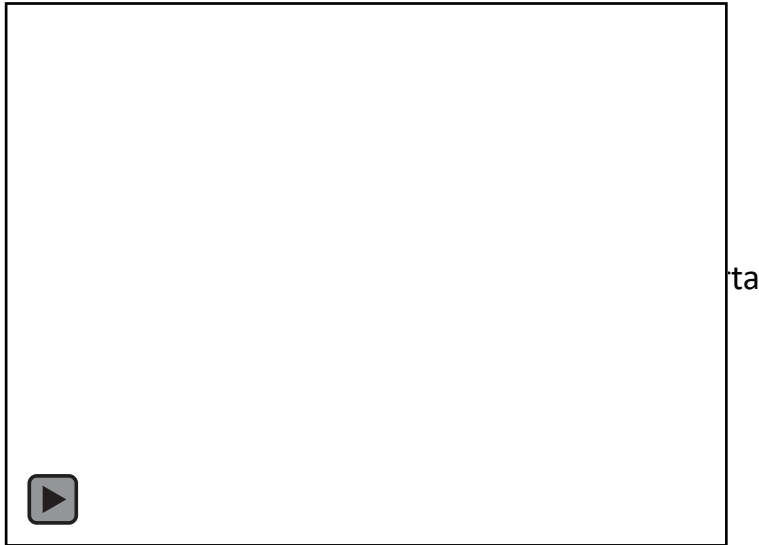


New MR during during percutaneous edge-to-edge repair

- Tissue view mode with color allows more 'realistic' visualization of the perforation color PISA

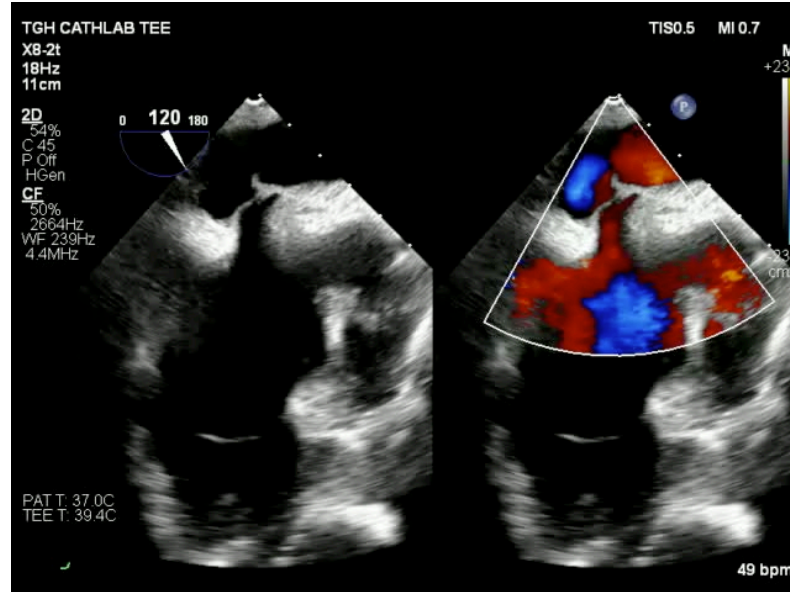


3DE and Interatrial Septal Puncture



- 3D Biplane imaging allows localization of the puncture site
 - Bicaval view to determine if superior or inferior
 - Cut-plane with aorta at 3 o'clock position to determine if anterior or posterior
- Septal puncture location will vary depending on the procedure

Septal Puncture Limitations



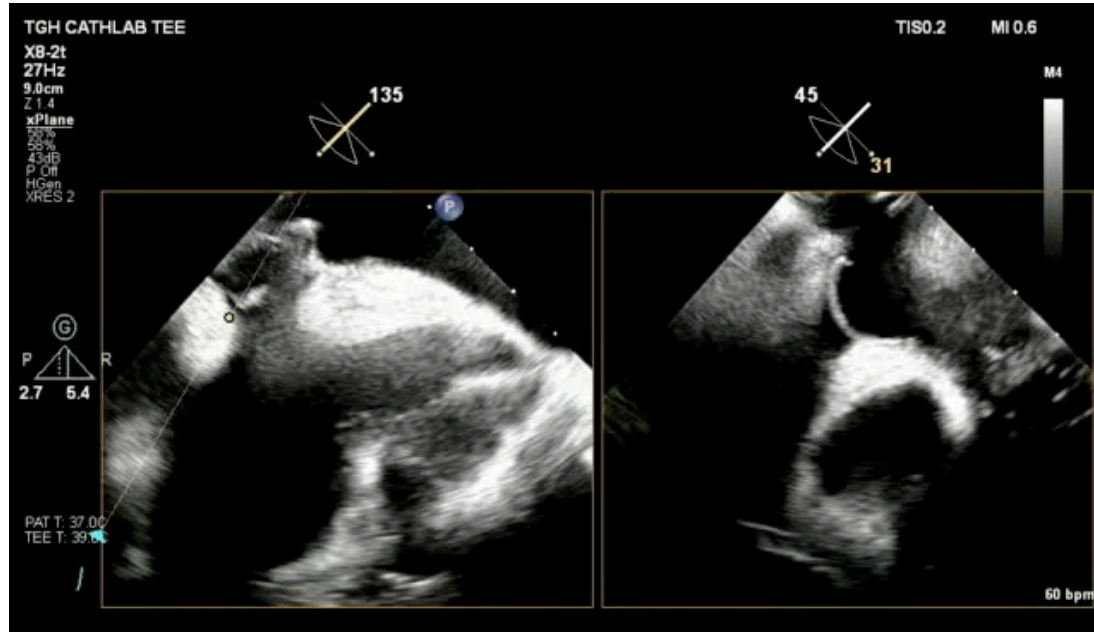
- Challenging with thickened or aneurysmal interatrial septums

CASE Septal Puncture - LAA Device

- For LAA devices, plan to puncture posterior and either superior/inferior depending on LAA to allow for a straight path to the LAA

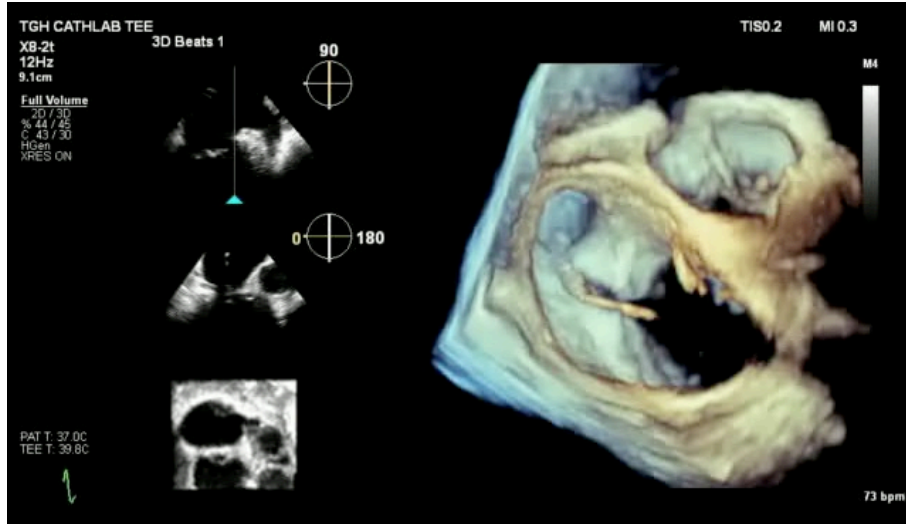


CASE Septal Puncture - LAA device

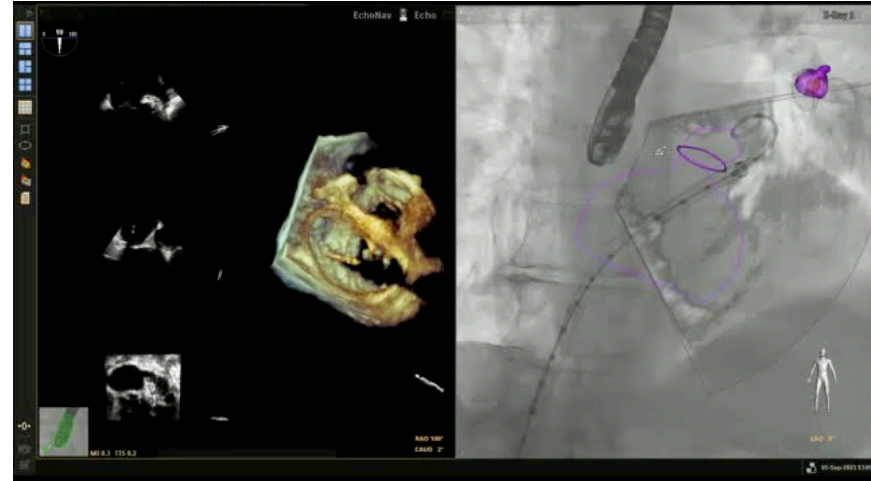


- However, the needle can slide along the IAS
- The puncture location may not be ideal as seen here was too inferior

CASE Septal Puncture - LAA device



Interventionalist's view



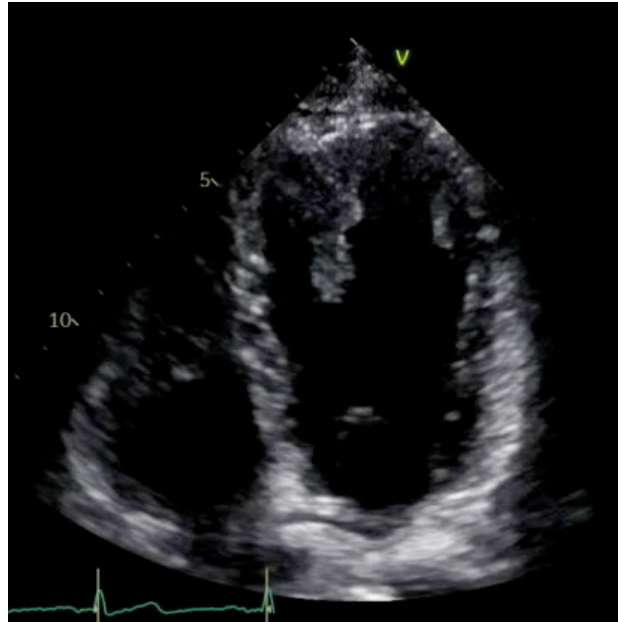
- Usually, 2DE guidance to the LAA
- Due to the inferior puncture, the wire going towards the MV
- Complete visualization with 3DE can help guide when the 2D imaging plane is challenging

Summary

- Due to time pressures, pyramidal size and the use of color has the biggest impact on 3DE quality
- Quick crop and multiplane methods can improve visualization
- New 3D rendering modes such as transparency and transillumination can improve periprocedural assessment

TGH STRUCTURAL PROGRAM





Thank you for listening!