

Role of TEE in Left Atrial Appendage Closure: Lessons Learned

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DISCLOSURE STATEMENT OF FINANCIAL INTEREST

In the past 12 months, I or my spouse/partner has had a financial interest/arrangement with the organization(s) listed below.

BSCI

- Scientific Advisory Board Member
- Speaker Bureau
- Equity Ownership

TEE is all I need.....

- TEE is a widely available imaging modality highly reliable, safe, easy to use , and happens to be the *only validated* technique for guidance and sizing for left atrial appendage closure
- TEE is affordable and can be used a *sole imaging tool* for screening, procedural guidance, and post implant evaluation

From a Cardiologist Perspective why is TEE the main imaging modality for LAAC

- Pre procedure (Pt. Screening)
 - TEE (advantages/disadvantages) "Validated" findings
- Guidance during implant
 - TEE (advantages/disadvantages)
 - Post procedure
 - 45 day follow up for sealing and proper device placement to guide ongoing medication regimen
- Cost effectiveness and Workflow

Pre-Procedural TEE for LAA Closure:

Provides a means to:

Rule out LAA thrombus

Detail LAA anatomy:

- Bends (location, angulation)
- Lobes, bifurcation
- Pectinate muscle/ridge/trabeculation

Envision LAA device fit

Assess surrounding structures (IA septum, LA, PV)

Measure LAA dimensions

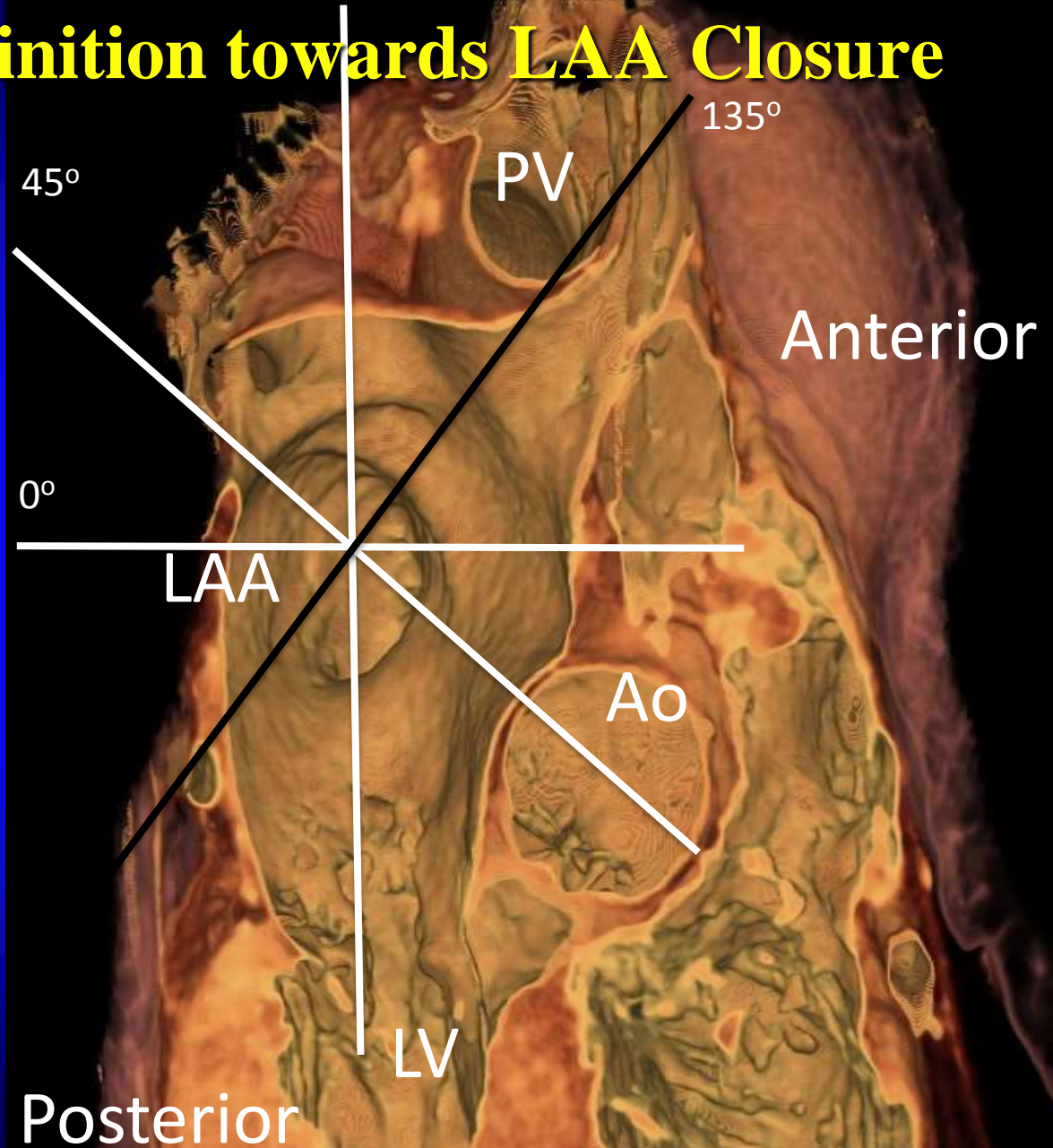
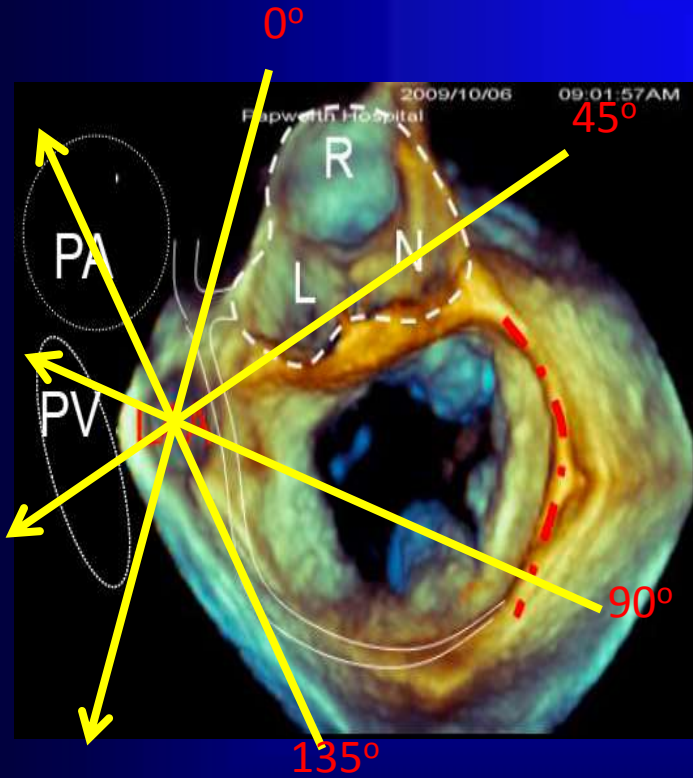
Select fluoroscopic angles if needed

Determine sheath selection

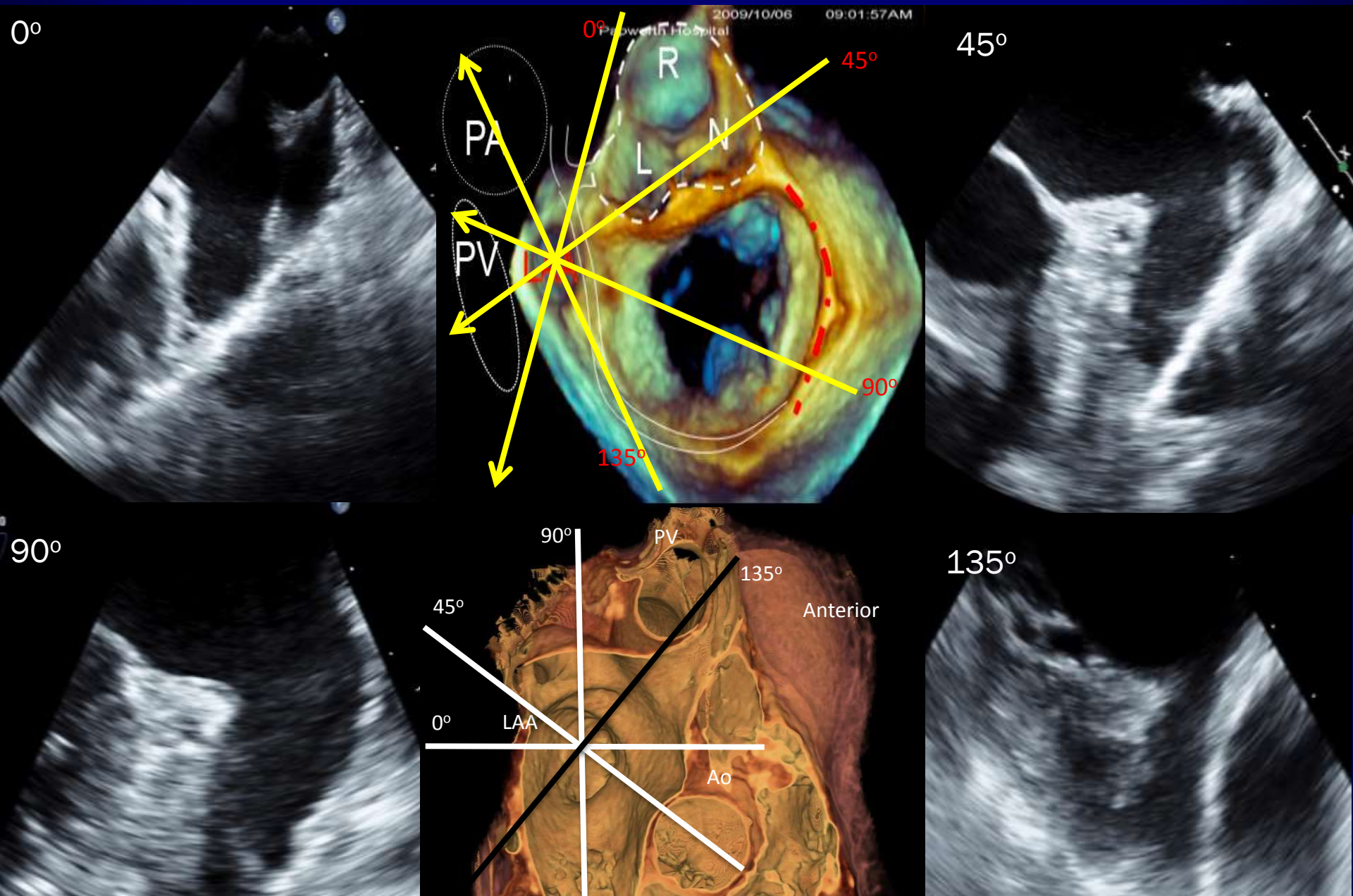
Determine transseptal location

Pre-Procedural 3-D TEE enhances anatomical definition towards LAA Closure

3D TEE To Assess LAA



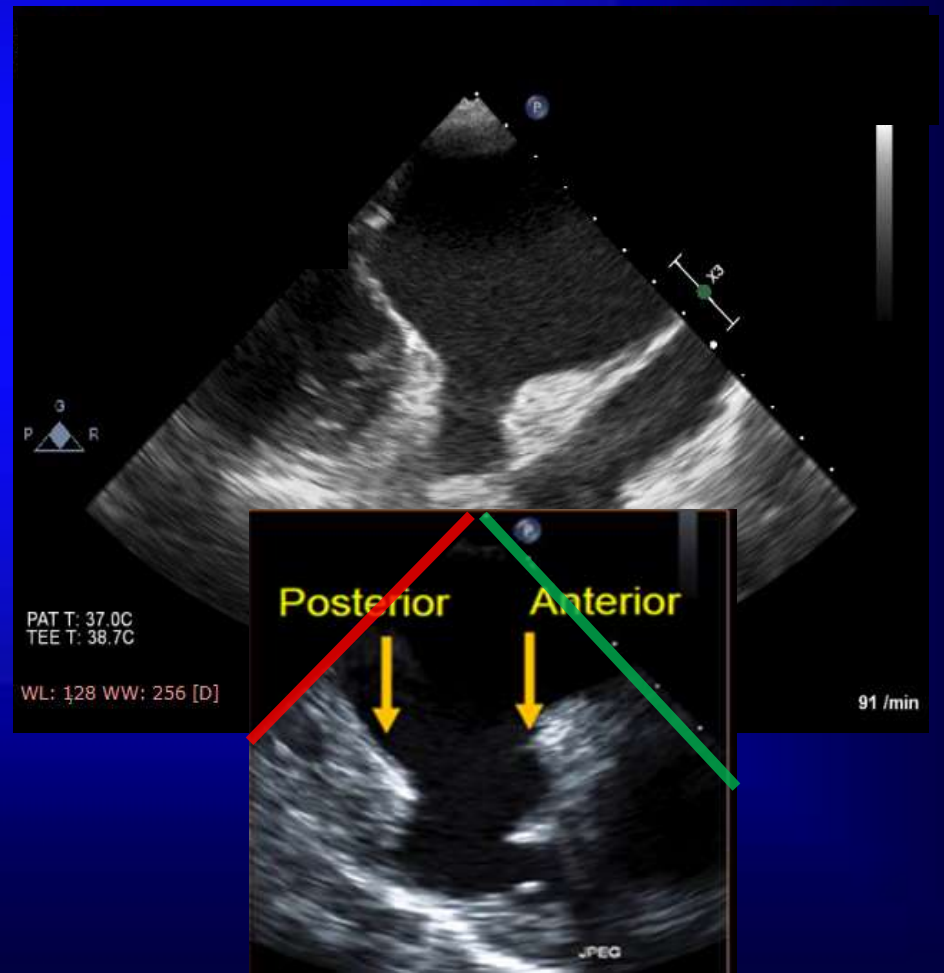
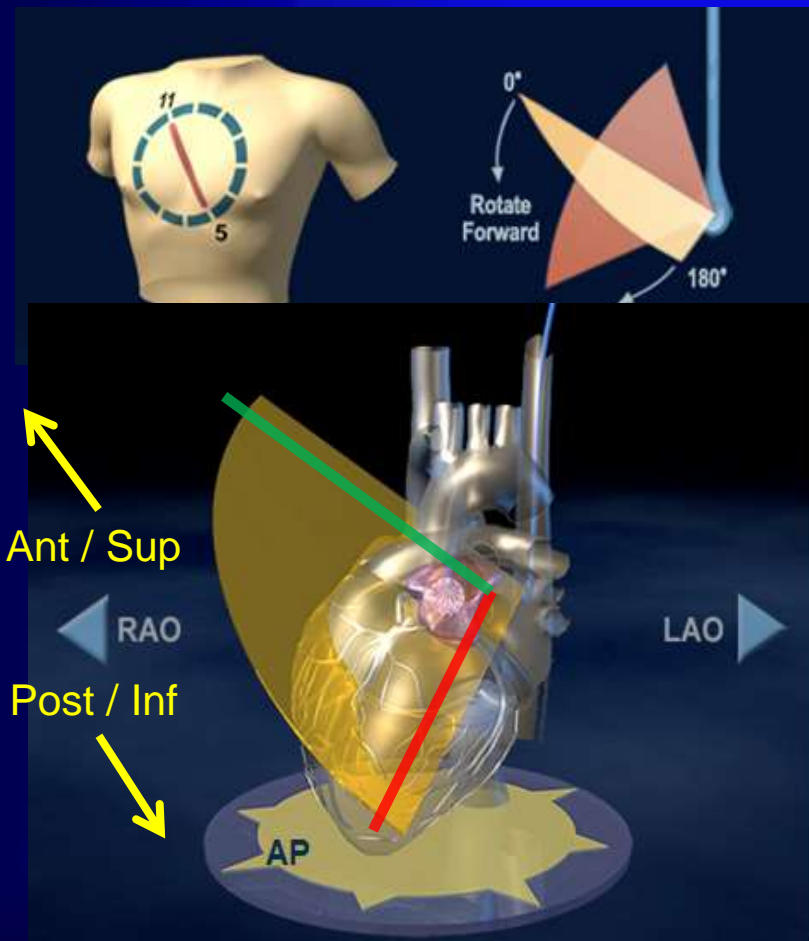
Standard validated TEE views for optimal LAAC include:



Understanding TEE

135°

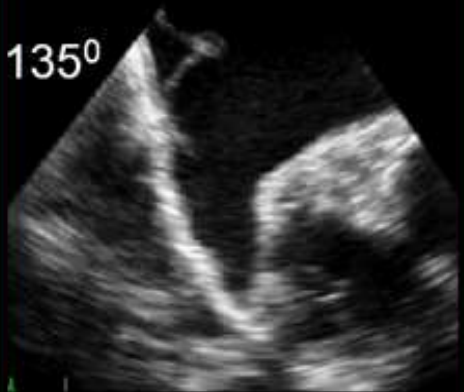
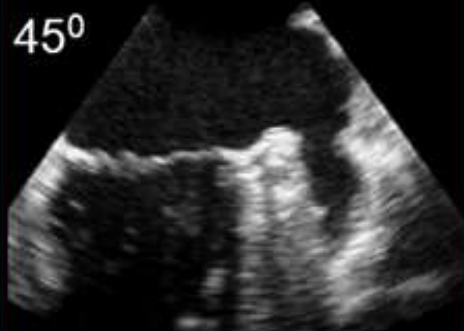
- Displays the widest axis of the LAA
- Reveals multiple lobes
- Determines best approach for procedure



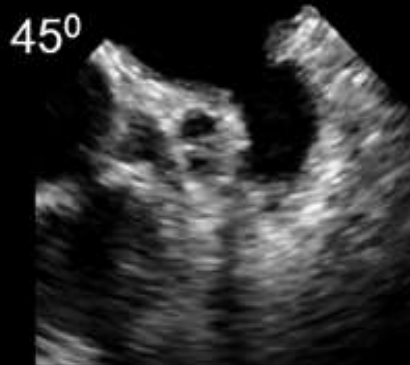
Understanding TEE

135°

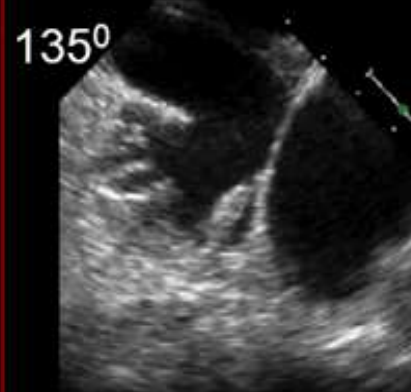
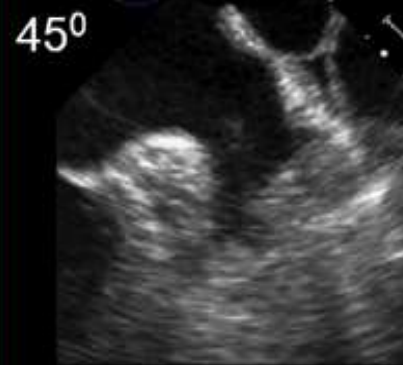
Regardless of the anatomy type



windsock



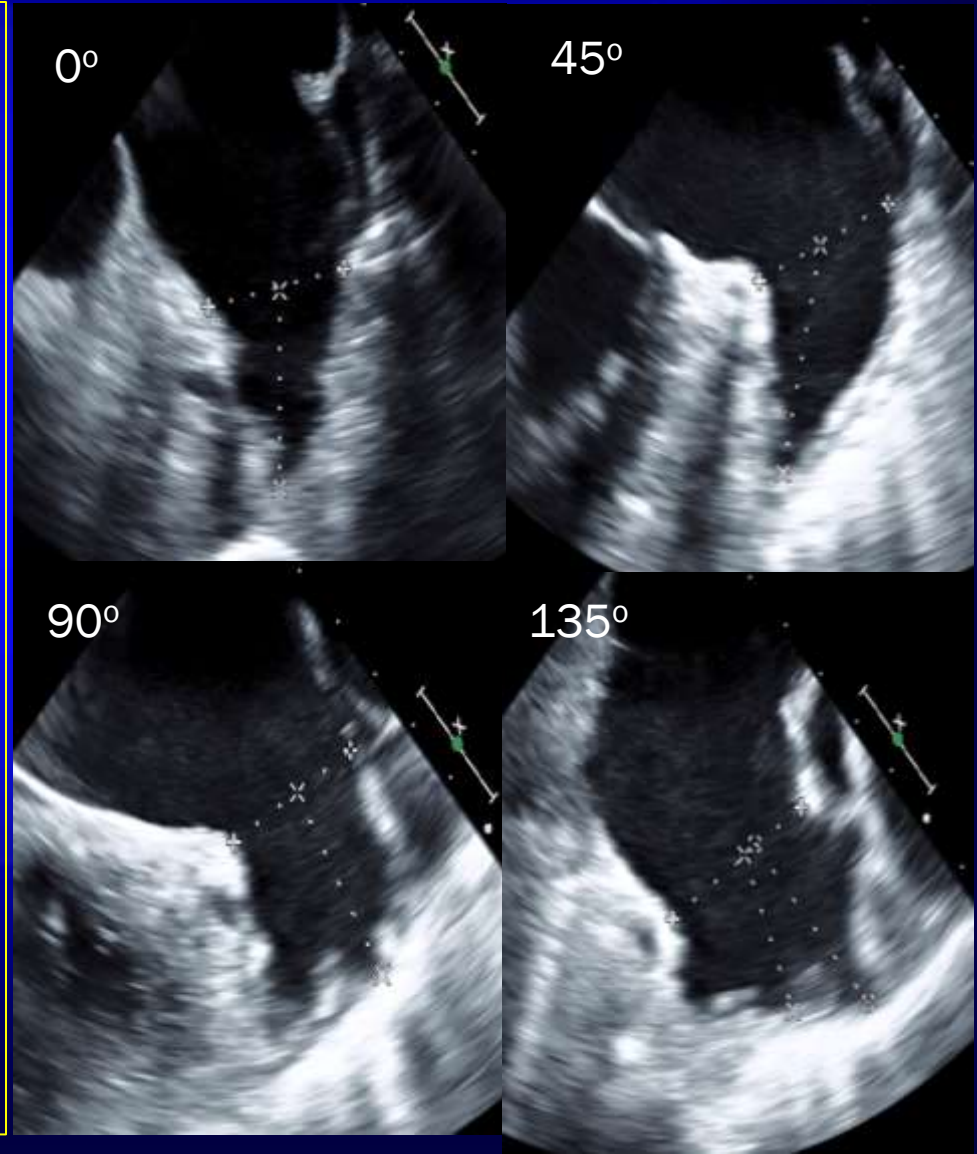
chicken wing



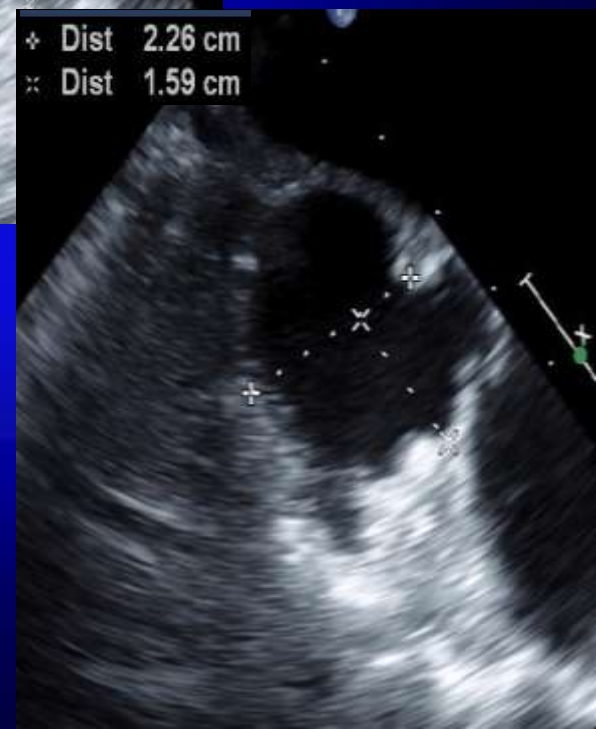
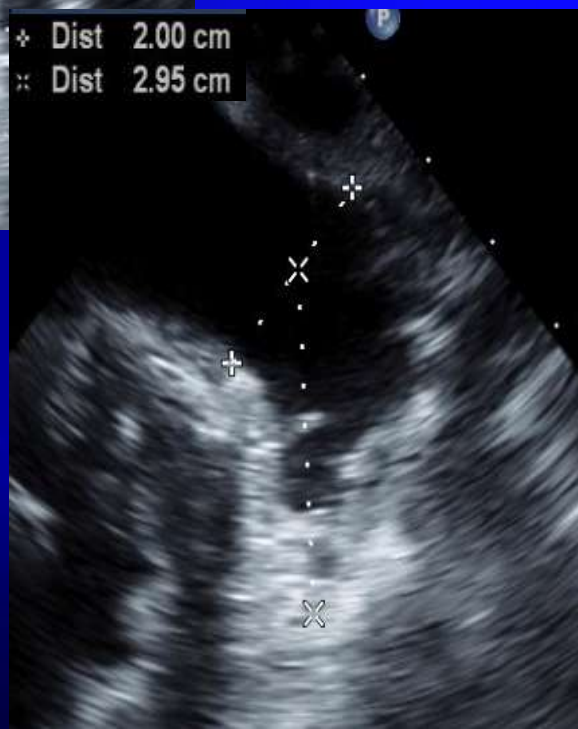
cauliflower

Unlike CT, TEE views and measurements have been *validated* in robust clinical experience with WATCHMAN:

- 0 and 135 degrees often give widest ostium diameter
- 45 and 90 degrees usually give the most depth
- Depth should be \geq ostium diameter to accommodate WM
- Anterior lobes usually superior
- Posterior lobes usually inferior
- WM oversizing 9-25% (>2-4mm)



Routine measurements using TEE in various projections for optimal sizing



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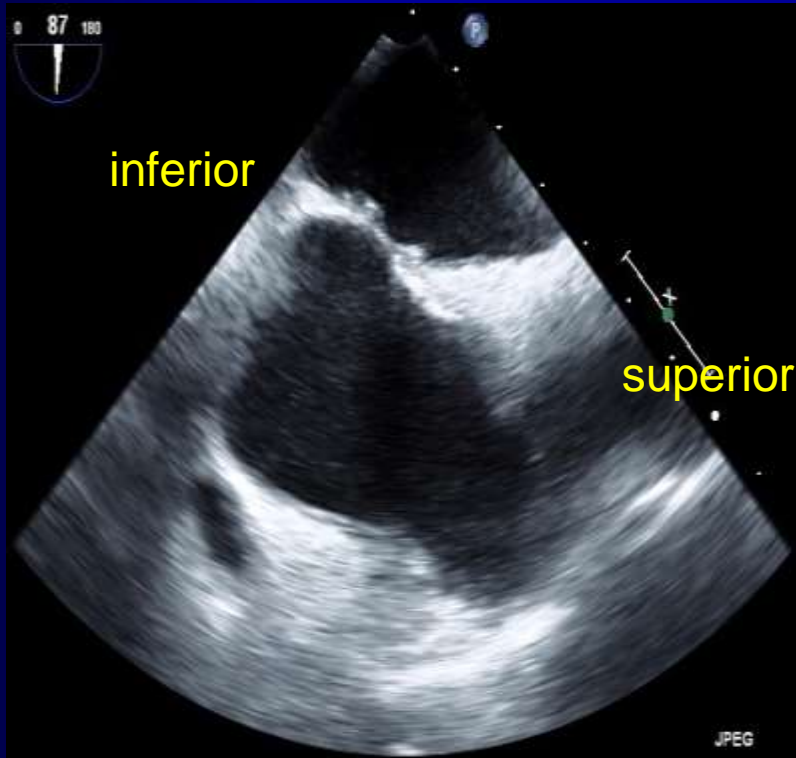
TEE for procedural guidance

Intra Procedural TEE

- Guide trans septal puncture
- Guide placement of access sheaths
- Guide device placement and assess release criteria



TEE is the easiest imaging modality to aim for safe and precise trans septal puncture: “inferior-posterior”

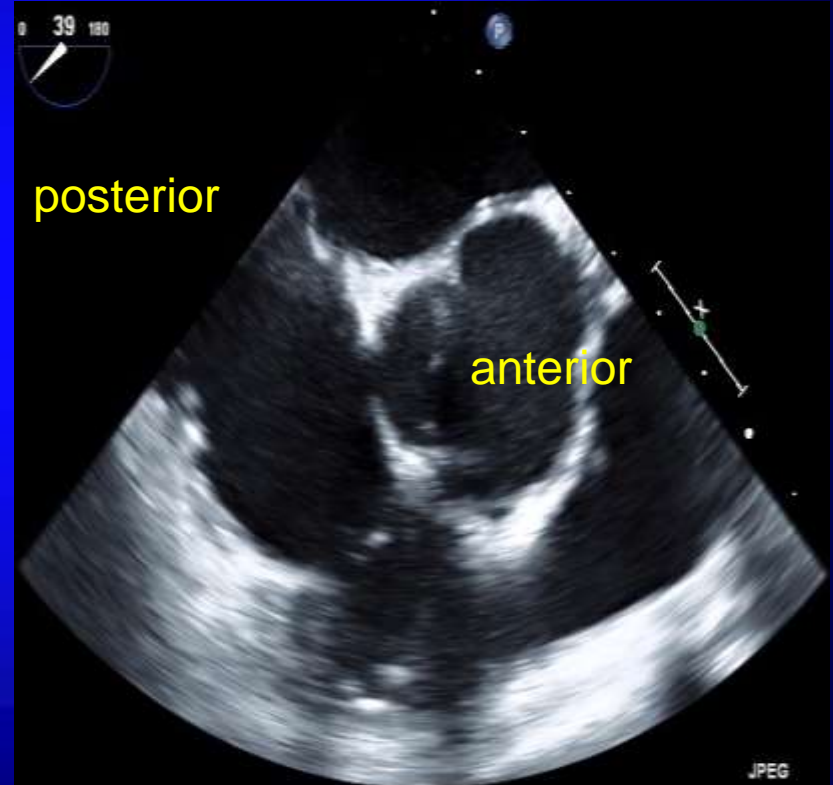


Bicaaval View:

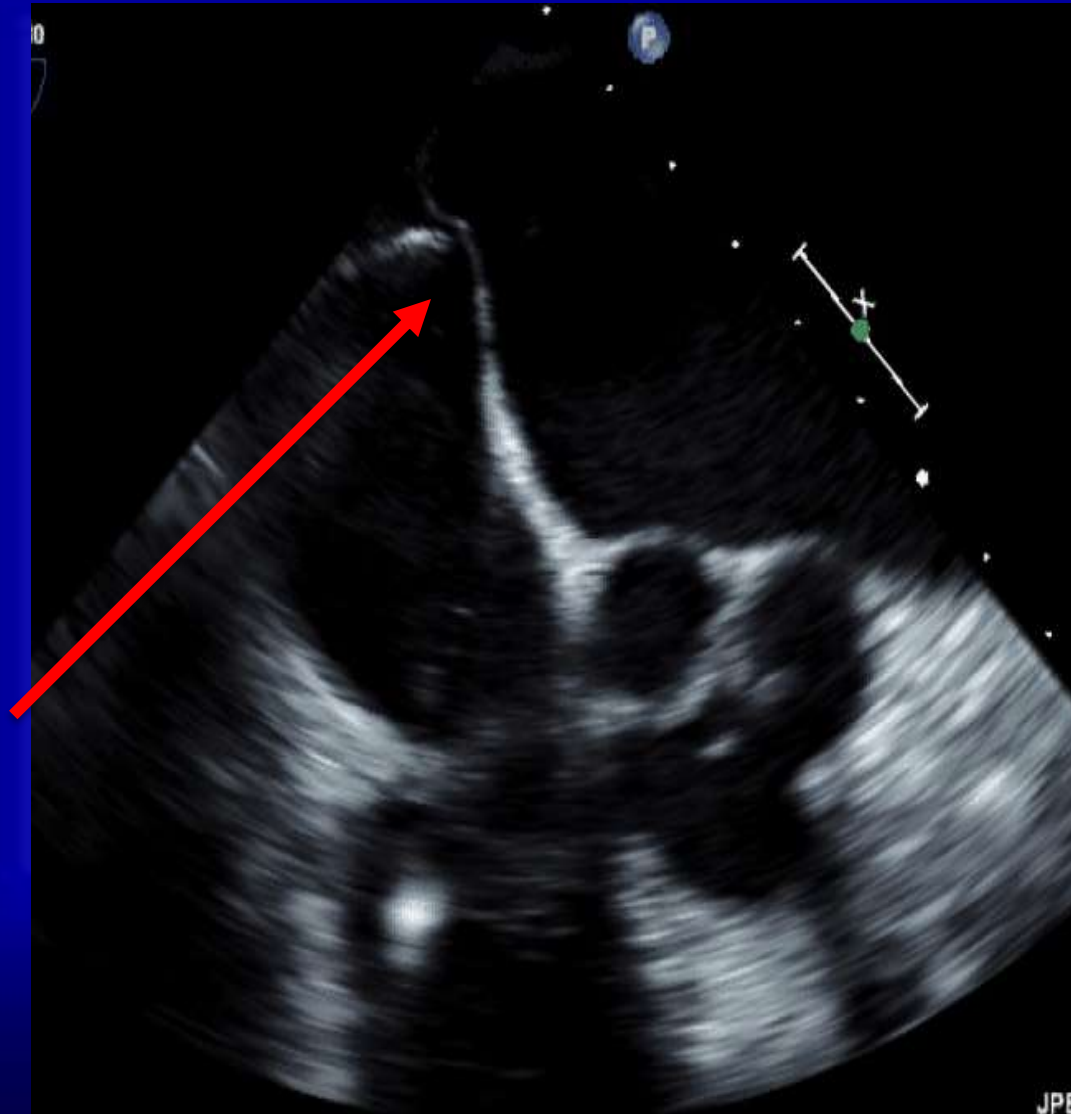
- 90-100 degrees

Short-axis View:

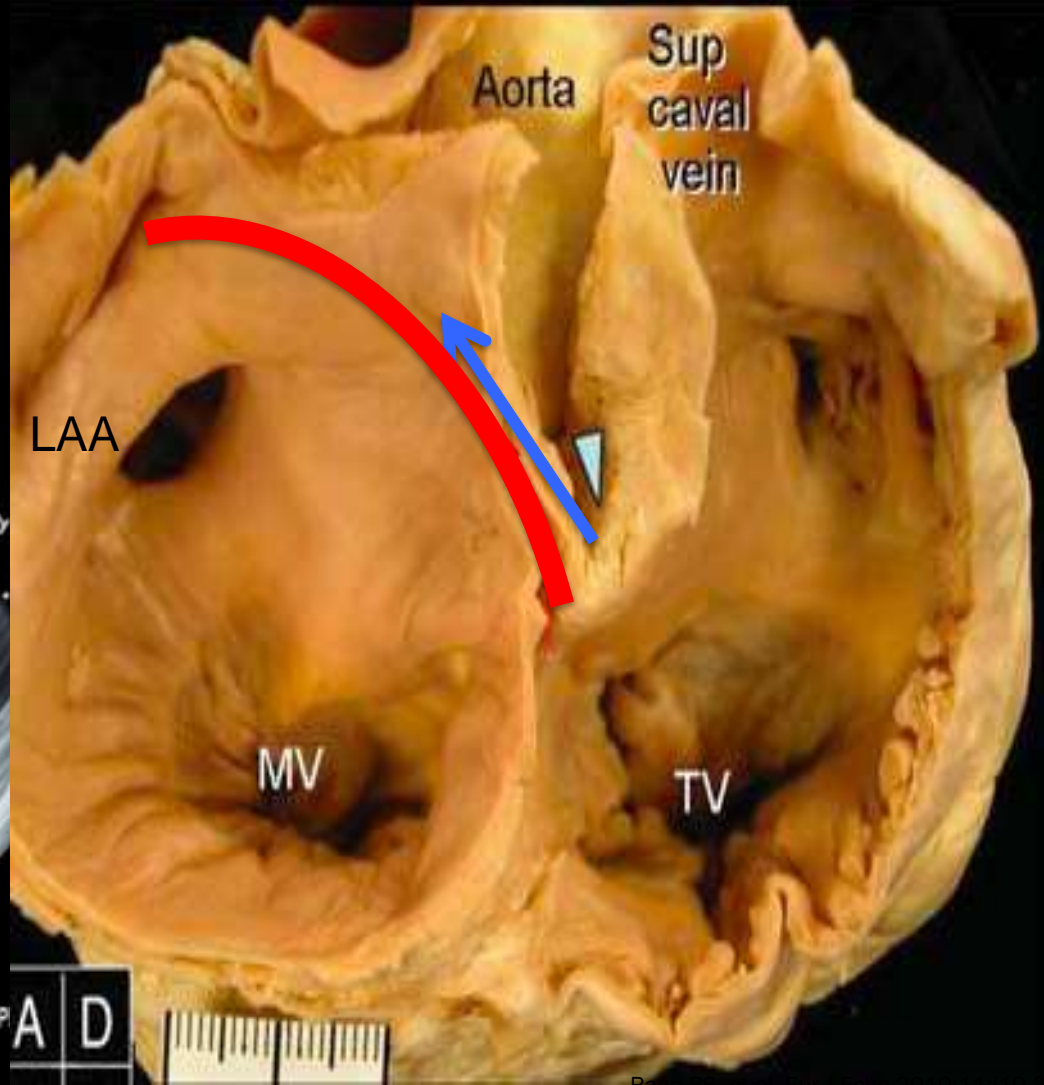
- 35-50 degrees



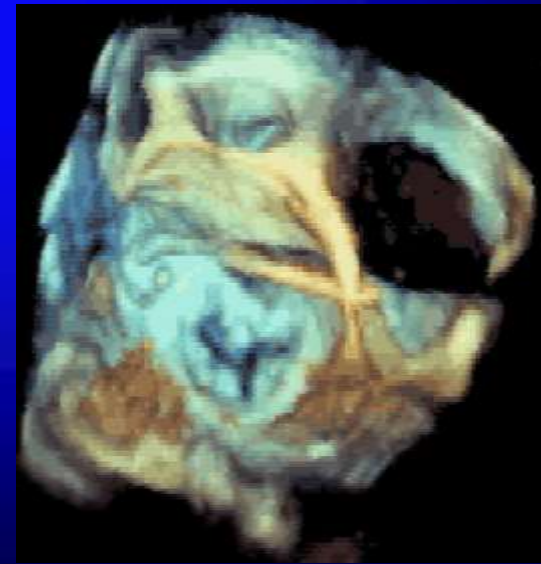
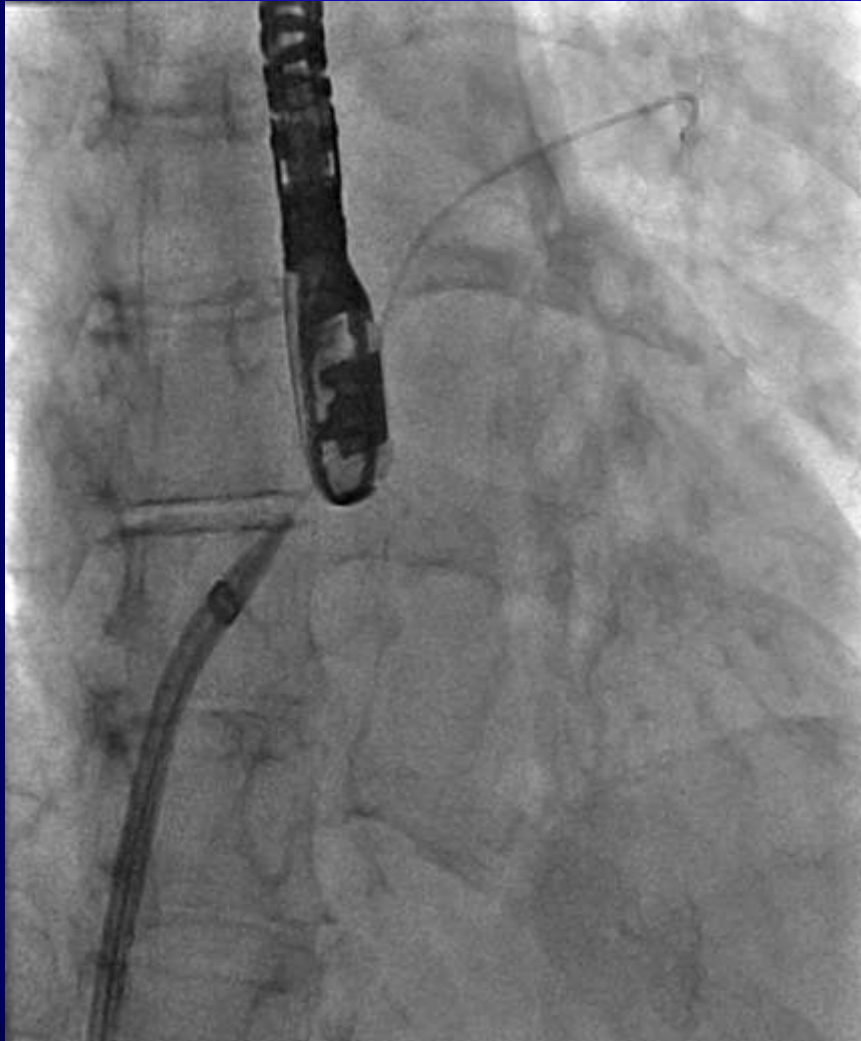
TEE guidance for trans septal puncture: Tenting while aiming inferior-posterior



Always assess for & avoid PFO



TEE for LAAC device implant: Access Sheath Guidance



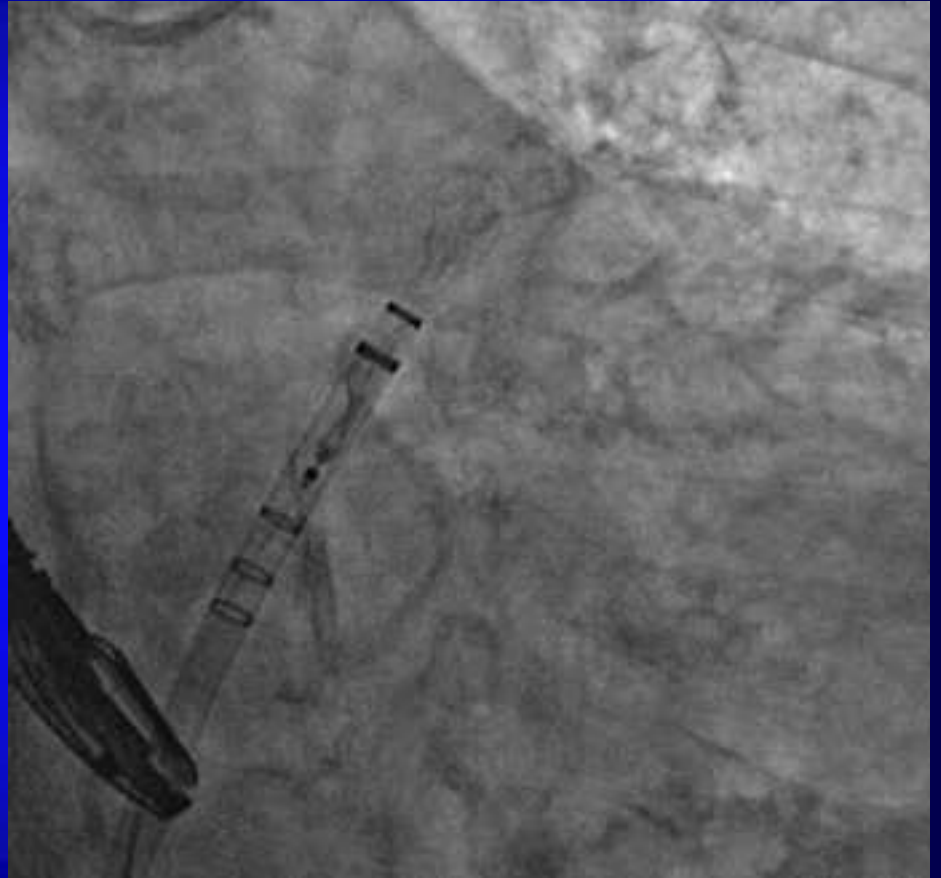
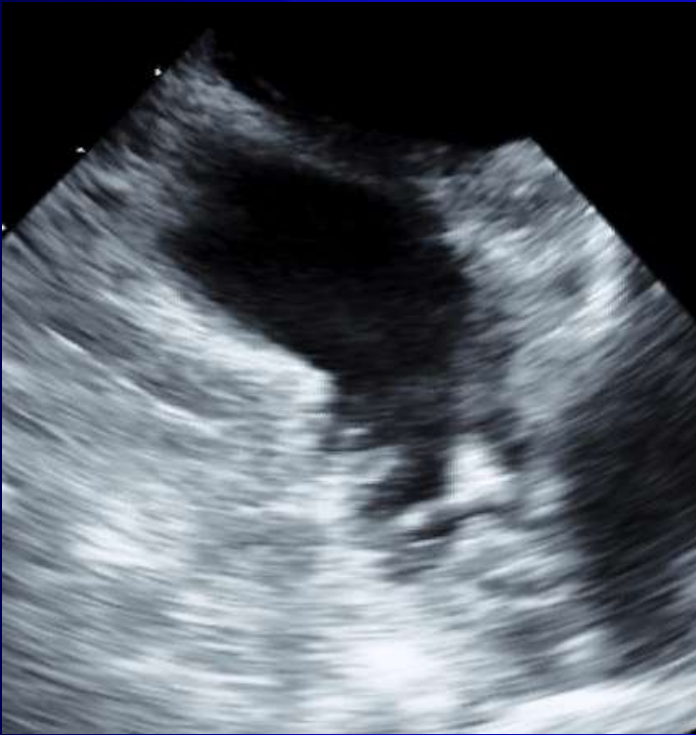
TEE for LAAC device implant: Access Sheath Guidance



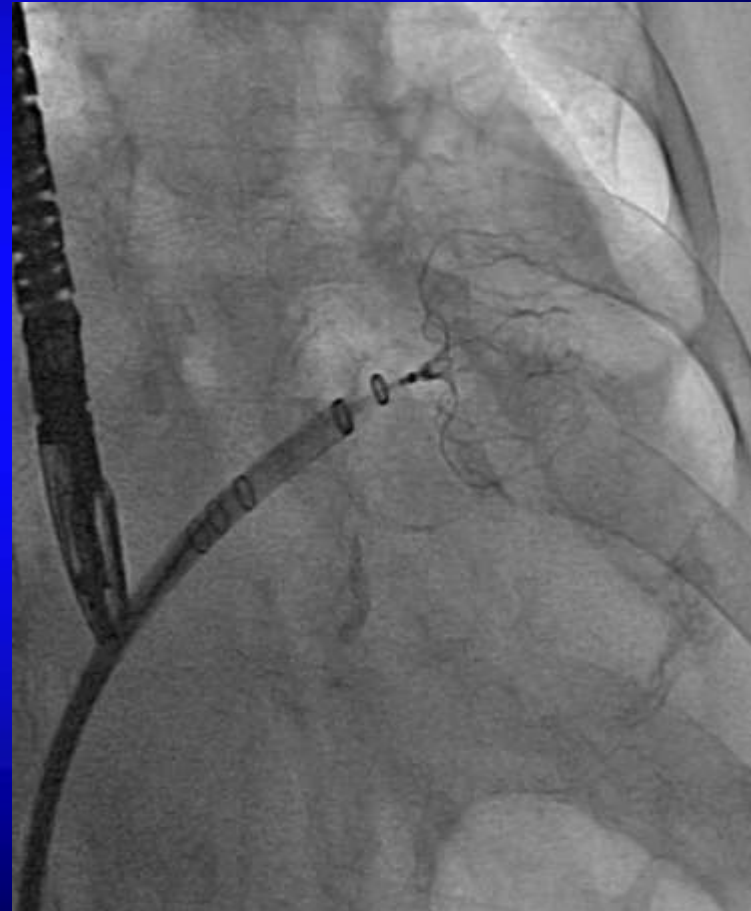
Visualize LAA & LUPV:

- 30-50 degree & counterclock

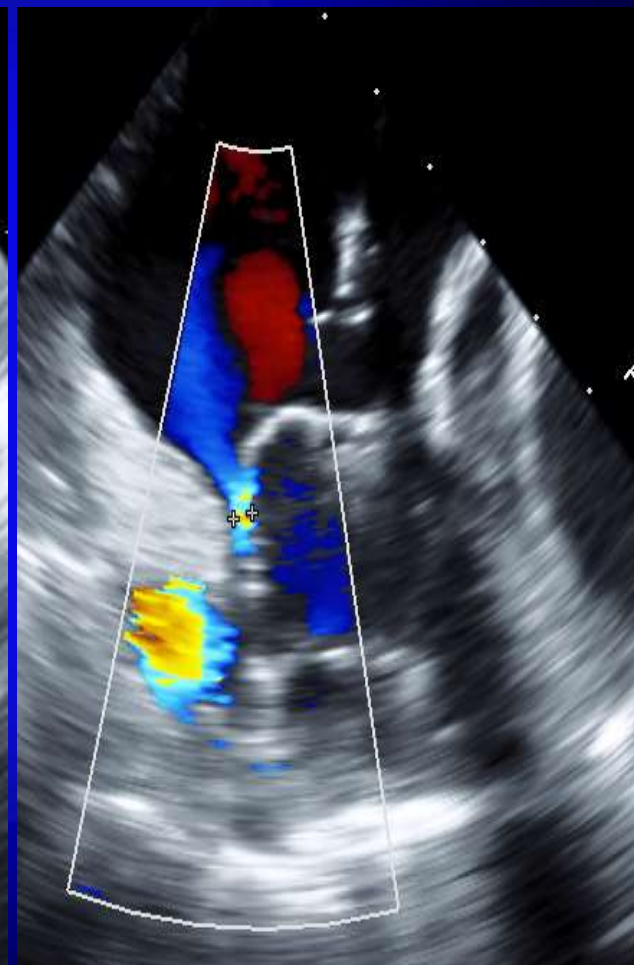
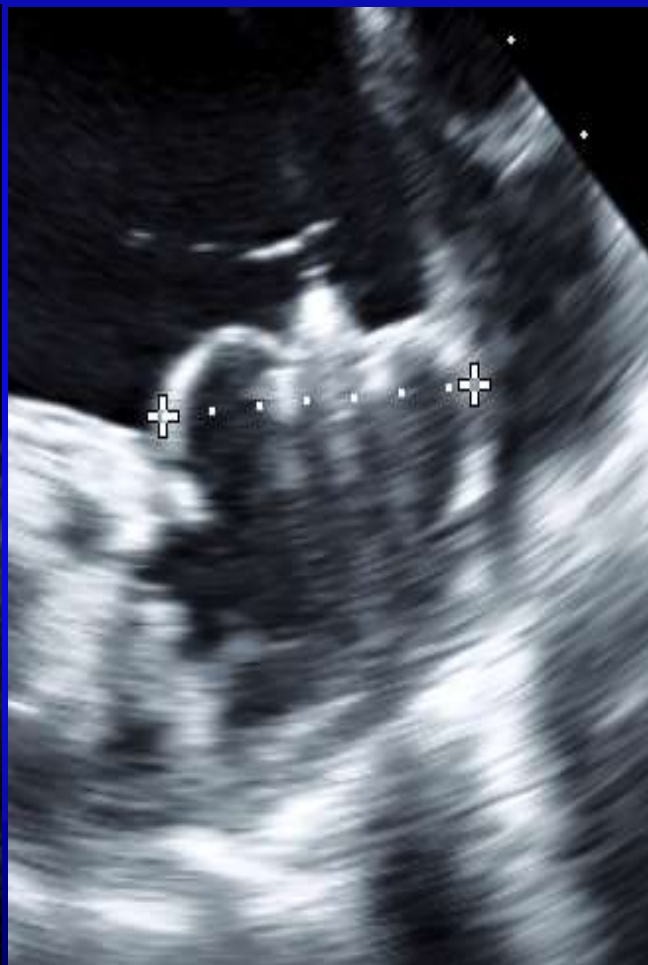
TEE for WATCHMAN implant : Guiding Deployment



TEE for WATCHMAN Implant: Tug Test

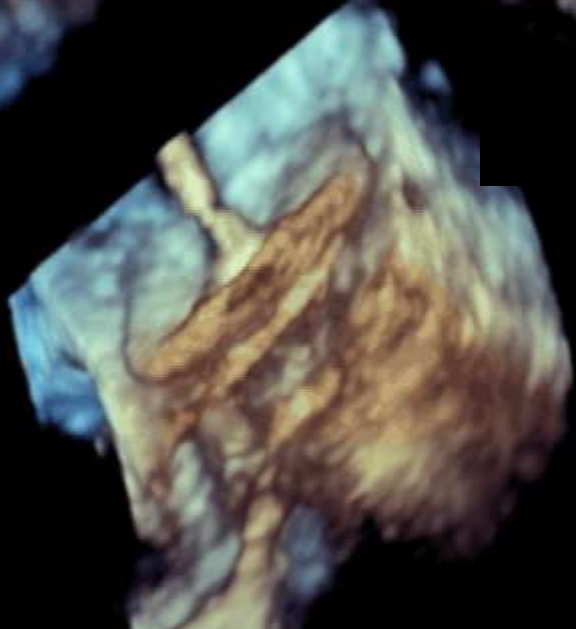
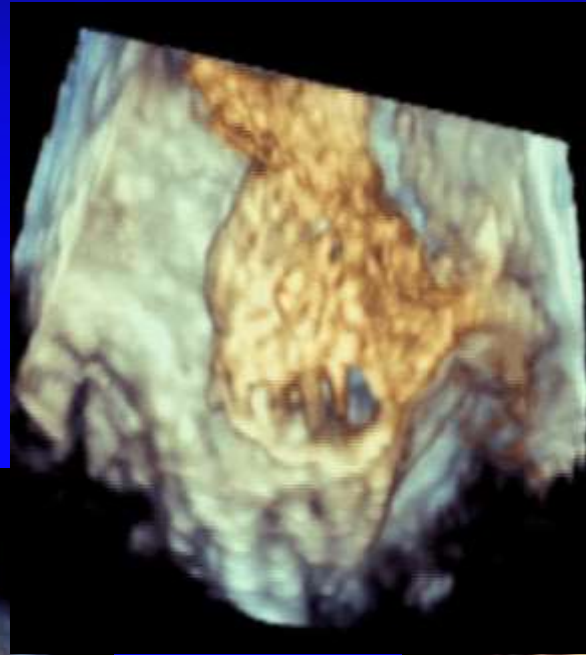
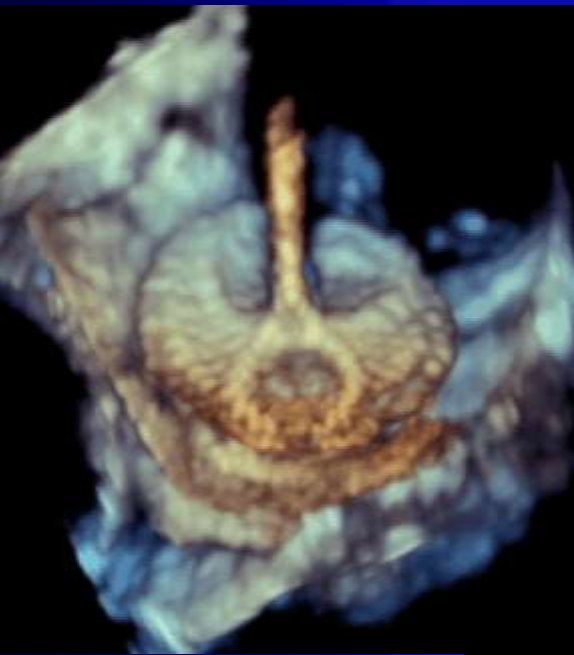


TEE for WATCHMAN implant: Compression & Seal

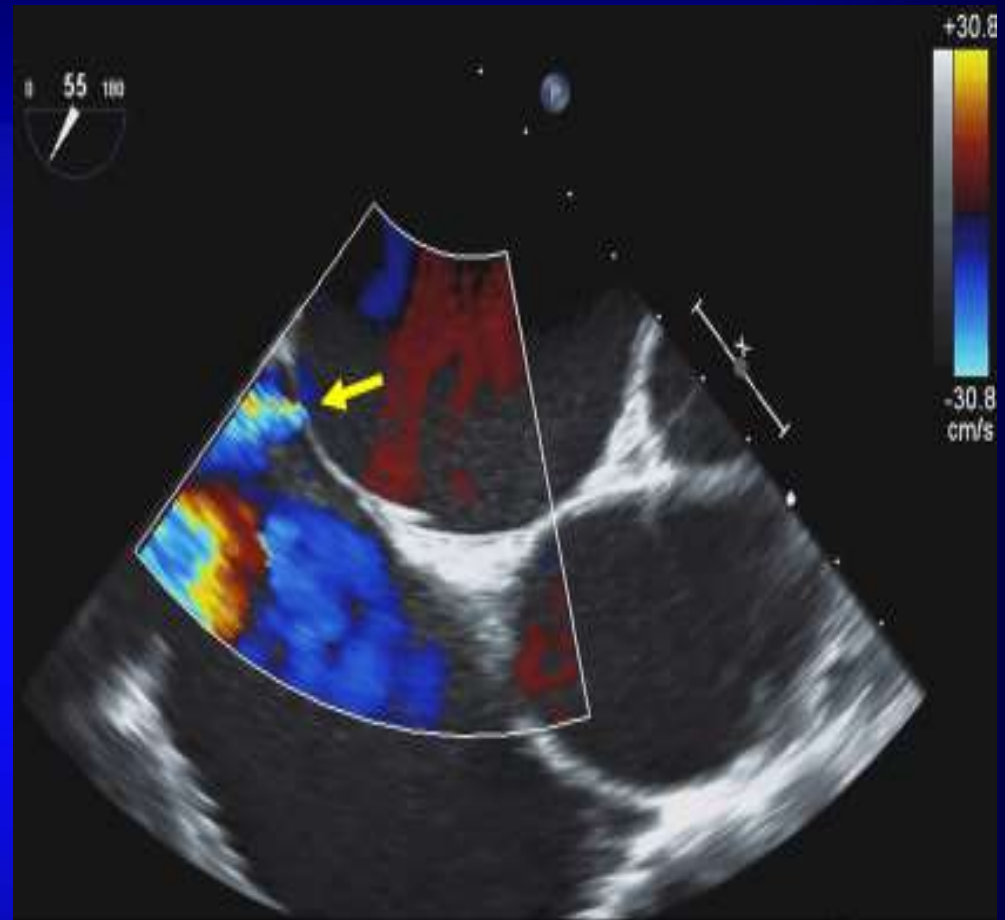


- Device compression 8-20%
- Peri-device leak <5mm

TEE for WATCHMAN implant: 3D TEE before Release



Assess Residual Iatrogenic Atrial Septal Defect & Pericardial effusion



TEE vs ICE

- TEE

- Widely Used imaging modality with significant experience and expertise amongst many operators. Highly reproducible results in experienced operators
- Can be done under moderate sedation and not with general anesthesia
- Safe and least expensive imaging modality with no excessive radiation exposure
- Results validated thru decades of studies correlating TEE findings with acute and long term LAAC outcomes

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TEE for Routine Device Surveillance

Post-LAAC

- Important to assess for:
 - Residual leak (LAA patency)
 - Device-associated thrombus
 - Device positioning (embolization)
 - Surrounding structures
 - Pericardial effusion
- TEE should be routinely done at 1-6 months post-LAA closure to assess for these abnormalities and determine optimal post implant medication regimen



From a Cardiologist Perspective why is TEE the *Optimal* imaging modality for LAAC

- TEE remains the most commonly used, least expensive and most versatile imaging modality to support LAAC implant
- TEE is the only imaging modality tested in RCTs
- There is much desire to use other imaging techniques in order to:
 - Increase patient comfort
 - Facilitate pre-case planning
 - Reduce number of personnel required to perform procedure
 - Improve/Optimize device placement
- Studies will be needed to correlate and confirm that measurements with other techniques compare favorably to the proven track record and excellent outcomes with TEE as the sole imaging modality

THANK YOU